PAPER II

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UNIT ONE: INTRODUCTION TO REPRODUCTIVE HEALTH

In this unit you will cover the major reproductive health policies and their application in the provision of quality reproductive health services. This will include policy guidelines and strategies laid down by the Government of Kenya (GoK) to guide the implementation of Reproductive Health (RH) programs in the country. You will also examine Adolescent /Youth health, Gender Issues in relation to Reproductive Health Rights and the Safe Motherhood Initiative (SMI).
This unit is composed of four sections:

- Section One: Historical Background of Reproductive Health Policies
- Section Two: Adolescent and Youth Health
- Section Three: Gender Issues and Reproductive Health Rights
- Section Four: Safe Motherhood and Child Survival Initiative

Unit Objectives

By the end of the unit you will be able to:

- Describe the national policy/strategic guidelines of reproductive health
- Identify adolescent/youth health issues
- Describe the provision of effective youth friendly services
- Explain gender issues in RH
- Explain the Safe Motherhood Initiative

According to the program of Action of the International Conference on Population and Development (ICPD) held in Cairo in 1994 Reproductive health is defined as:
'A state of complete physical, mental and social well-being and not merely the absence of disease and infirmity, in all matters relating to the reproductive system and to its functions and processes.'

SECTION1: HISTORICAL BACKGROUND OF REPRODUCTIVE HEALTH POLICIES

Introduction

In this section, you will discuss some of the weaknesses identified by the Kenyan Government concerning the quality of health care given to citizens over time. In other words, you will find out why the government places importance on reproductive health issues.
You will also learn about the goals and strategies the government has formulated to make this service available, accessible and, to some extent, affordable to all at every level of the service delivery system

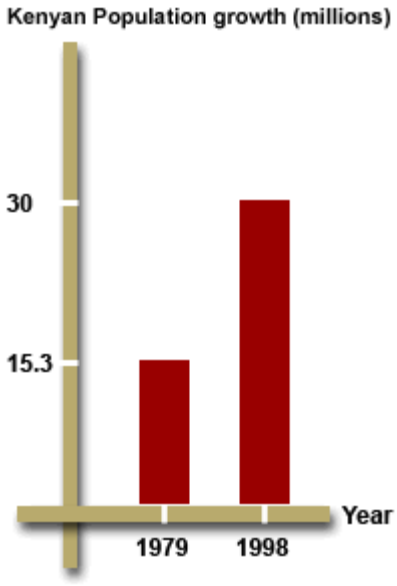
Objectives

By the end of this section you will be able to:

- Describe the evolution of reproductive health programmes
- Describe the national policy guidelines on the implementation of reproductive health programmes in Kenya
- Define the concepts of integrated comprehensive reproductive health services
- Describe strategies for implementing the reproductive health plan components
- Describe the structure of reproductive health servicesin Kenya

Evolution of Reproductive Health Programmes

During a Kenyan population census conducted in the late 1950's, the fertility and growth rates of Kenyans were found to be high. In response, the government adopted Family Planning (FP) as an important component of socioeconomic development in the 1960's.
As early as 1965, when fertility control was a primary focus, the Government of Kenya (GoK) recognised population planning and family planning as part of the National Planning Strategies of Sessional Paper No. 10 of 1965. In 1967, the Family Planning Programme was established (GoK/MoH, 1998).
Since then, the fertility rate, which was 7.9% in 1979, has decreased to 5.45% in 1993, and the population growth rate has reduced from 3.8% in 1979 to 3.4% in 1993 (CBS, 1995). You may argue that this is still high. The population of Kenya was 15.3 million in 1979. By 1998, it has doubled to approximately 30 million (NCPD, 1998). Meanwhile, the growth of the economy has not kept pace with the growth of the population.



If the population growth rate is higher than the economic growth rate, it creates a burden on available land, health facilities, educational resources and the job market. These factors often impact more on mothers and children, whose mortality and morbidity rates are high, mainly due to complications associated with pregnancy and childbirth and HIV/AIDS prevalence.

In 1974, further evaluation of reproductive health services established that the child health services were running parallel to those of family planning and antenatal care. This arrangement was viewed as inefficient. As a result, these services were integrated to offer a more consolidated package. Following this, the Maternal/Child Health Care and Family Planning (MCH/FP) Programme was established.

In 1987, the Safe Motherhood Initiative (SMI) was launched at the Conference on Better Health for Women and Children, held in Nairobi, Kenya. The Government of Kenya endorsed the Plan of Action to reduce maternal mortality and morbidity rate, which was developed at that conference.

Despite this policy shift, many reproductive health programmes continued to run as vertical entities at all levels of the health service delivery system. The vertical approach to service provision proved somewhat wasteful and inefficient in terms of utilising resources including health manpower. It also proved ineffective in reaching critical target groups in need of information and services, especially adolescents and the youth.

Reproductive health issues have caused great concern not only in Kenya but also the world over. As a result, governments and other stakeholders came together in Cairo in 1994 to address these concerns and to look for solutions to problems being experienced worldwide. At the International Conference on Population and Development (ICPD), 179 countries endorsed a Reproductive Health Agenda. The ICPD Programme endorsed a shift in development strategies, urging member countries to review and revise health policies to focus on meeting the needs of an individual, and on the provision of basic as well as comprehensive and quality RH services.

The comprehensive concept of RH is based on the World Health Organisation (WHO) definition of RH, which recognises the fact that RH is closely interrelated with policies to empower women, strengthen families, stabilise population growth, and eradicate poverty. In response to ICPD recommendations, the concept of integrated RH services was developed and launched to meet the revised policy on RH care. Integrated RH creates demand for, and ensures provision of RH services, defined for each level of the health care system, everyday, during the same visit, under one roof, and where possible by the same provider 'the supermarket approach'.

Kenya is signatory to the Cairo Declaration of 1994, which marked a turning point in the field of population and health development, not only for Kenya but the whole world. As a response to the 1994 ICPD in Cairo, the Kenya government developed and launched the Health Policy Framework Paper of 1994. This policy document provides the blueprint for strategies for the development and management of health services in this country.

A notable policy document is the National Reproductive Health Strategic Plan of 1996, covering the period 1997 - 2010. This document guides the implementation of a comprehensive and integrated RH programme in Kenya for the next decade. In order to operationalise the 1997 - 2010 Strategic Plan, the Ministry of Health (MoH), in collaboration with various stakeholders, designed and launched a series of policy documents to spearhead the long term reform process.

The MoH and its development partners have since used this policy document to review,

revise and develop a series of guidelines related to reproductive health services.

National Policy and Guidelines in Reproductive Health

A policy is an official statement issued by the government, a company or a non-governmental organisation (NGO) to guide the workers on what to do. It is a statement on the 'course of action decided on by the government.'
Policy guidelines are written instructions that give directives with regard to the practices that should be followed in the provision of services to the consumer. For our purposes, the services in question are reproductive health services and the consumer is the patient who makes use of the services.

GoK Policy Guidelines for the Implementation of Reproductive Health Services

These guidelines aim to:

- Create awareness among leaders, communities and programme implementers of the need to promote high quality reproductive health services, in order to improve the well being of the people
- Make available quality and sustainable family planning services to all who need them, in order to reduce the unsatisfied needs for family planning
- Reduce health and socioeconomic burdens due to STDs/HIV/AIDS and their implications or effects
- Enhance the health and well being of adolescents and youths
- Reduce the incidence of infertility and facilitate proper investigations and management of infertile individuals and couples
- Eliminate all forms of discrimination against women and female children to enable them to exercise their sexual and RH rights and to promote their equal representation in all levels of political and public life
- Enhance both men and women's health throughout their life cycle
- Provide quality and sustainable comprehensive RH services in all service delivery points (SDP's) and community levels

As mentioned earlier, the GoK responded to the 1994 Cairo ICPD Agenda and approved the Kenya Health Policy Framework (KHPF) as the blueprint for the development and management of health services in this country. To operationalise the document, the MoH developed the National Health Policy Framework (NHPF) Implementation and Action Plan, and facilitated the establishment of a Health Sector Reform Secretariat in 1996. The Secretariat has since provided an enabling environment for the implementation of various activities to meet the objectives of the RH implementation plan.

The Implementation Plan for National Reproductive Health Strategy of 1998 Covering the Period 1999 - 2003

The development of this national implementation plan represents Kenya's determination not only to operationalise the reproductive health strategy but also to address the immediate causes and underlying factors that affect the health status of the population.
This policy document provides a list of RH plan components in order of priority.
The MoH, in collaboration with provinces and districts, set out to operationalise the RH policy document by identifying and prioritising various RH plan components with an emphasis on women and children, adolescents and youths and other groups, who experience difficulties in accessing health care.
Among other priorities, all stakeholders expressed the need to train health care providers at all levels in reproductive health issues. This led to the development of The National Reproductive Health Training Plan of 2000.

The National Reproductive Health Training Plan of 2000 Covering the Period 2000 - 2004

This policy document addresses the weakness identified in relation to the various care providers at all levels of the care delivery system. The identified weaknesses included:

- Inadequate clinical skills
- Poor knowledge
- Poor managerial skills
- Poor communication and counselling skills

The reproductive health training plan document focuses on the strengthening of pre-service and in-service training activities to facilitate the provision of integrated and comprehensive reproductive health services.

The GoK/UNICEF 2004 - 2008 Programme of Co-operation (Draft Strategy Paper), February 2003

This document provides policy guidelines for provision of quality care and training. Documented in this strategy paper are key results and lessons learned from the ongoing five year National Strategic Plan covering the period 1999 - 2003. So far, the five year programme has failed to raise other resources for safe motherhood activities. There has, therefore, been a minimal impact on the reduction of maternal mortality rate. However, some important achievements have been made, especially on the promotion of the concept of essential obstetric care and the introduction of life saving skills. It is necessary to note the shift in RH policies within the five year programme, which targets:

- Advocacy for policy change in the provision of reproductive health services
- Encouraging and strengthening the implementation of existing policies
- Capacity building through community participation and resource mobilisation, rather than on service delivery

Thus, during the first half of the implementation plan, strategies that rely more on advocacy, networking and knowledge generation were adopted. In recognition of the seriousness of the HIV/AIDS pandemic and in line with UNICEF regional policy, over the next five years (2004 - 2008) a strategy aimed at ensuring that HIV/AIDS is mainstreamed as a priority to spearhead all health and health related programs will be adopted.

Reproductive Health Policy (Draft Outline 2005)

The long term goal of the RH policy is to promote and enhance the reproductive health status of all Kenyans through the provision of equitable, sustainable, integrated, effective quality reproductive health care services that are accessible, acceptable and affordable for all. The general objectives of the policy are to:

- Guide planning, implementation, monitoring and evaluation of integrated quality gender sensitive RH services in Government, NGO, FBO and private sectors
- Standardise the quality and delivery of RH services
- Assist in resource mobilisation; ensure optimum, and efficient management of resources for the sustainability of effective RH services

Components of RH and Strategies of Implementation

It is clear that before the ICPD, most programmes equated reproductive health with Family Planning (FP). This resulted in the masking of reproductive health issues, for example, the Safe Motherhood and Child Survival Initiative, which would currently be considered priority reproductive health components. It is also obvious, as has previously been mentioned, that many of the RH programs in Kenya were administered as vertical (individual) entities at all levels of the health care system.

The 1994 ICPD called for a shift in development strategy away from vertical programmes to the provision of comprehensive and integrated reproductive health services. The vertical approach to service provision proved somewhat wasteful and inefficient in terms of use of resources including health care providers. The shift in the development strategies, and in health policies specifically has shown the way forward towards integration of reproductive health services. Similarly, training of service providers has been redirected to focus on assisting them to develop the actual and potential capabilities in the provision of quality reproductive health services at all levels of the service delivery system.

Integrated reproductive health implies that all patients have access to reproductive health services and information as specified in the National Reproductive Health Strategic Plan. The benefits of integrated reproductive health services are enormous.

Benefits of Integrated Health Services

- The provisions of more efficient and cost effective services since the same providers usually deliver services at the service delivery points.
- That no opportunity is missed for meeting patients reproductive health needs
- The creation of demand for and the development of actual and potential opportunities for provision of reproductive health services

- Efficiency within the existing system so that key technical interventions can be provided up to the peripheral level
- The creation of efficient services, improved patient satisfaction and health seeking behaviour
- The removal of one significant barrier to care by guaranteeing services availability on all days of the week
- Provision of reproductive health services, defined for each level of the health care system, on all days, during the same visit, and where possible by the same provider

In addition to the integration of reproductive health services, the 1994 ICPD Programme of Action emphasises the provision of comprehensive and quality care in order to meet individual health needs. It also identifies reproductive health needs and targets critical groups in need of information and services, especially the adolescents and the youth. The Ministry of Health and stakeholders, including the government, NGOs, and the private sector offer these services as outlined by the National Population Policy for Sustainable Development and the Kenya Health Policy Framework (KHPF) of 1994.

To this end, the Implementation Plan for National Reproductive Health Strategy spells out reproductive health plan components listed in order of priority.

components of the reproductive health plan.

Implementation Plan for National Reproductive Health Strategy

- Safe motherhood and child survival initiatives
- Family planning unsatisfied needs including male involvement
- Management of STI/HIV/AIDS
- Promotion of adolescent and youth health
- Gender and reproductive health rights including male involvement
- Screening and management of cancer and other reproductive health issues
- Prevention and appropriate management of infertility
- Care of the elderly

other supportive strategies critical in the implementation of reproductive health services.

Strategies Supporting the Implementation of Reproductive Health Services

- Human resource development and management
- Integration of reproductive health services including training
- Identification, mobilisation and allocation of resources
- Operational research in reproductive health and monitoring and evaluation as well as supervision

These components are discussed in greater detail in the subsequent units. An overview of priority RH plan components by district as outlined in the Implementation Plan of 1998 identifies crucial sectors, which you will explore in the following pages.

Safe Motherhood Initiative

WHO, UNICEF, the World Bank and other international agencies organised a conference on International Safe Motherhood. The aim was to address the health needs of women of childbearing age and bring to the world's attention the problem of high maternal mortality. The conference was also to look at what needed to be done to ensure that pregnancy and childbirth are safe events for women. Many women all over the world are dying from common obstetrical problems that can be managed by simple technology.

The primary means of preventing maternal deaths include:

- Providing access to emergency obstetric care, including treatment of haemorrhage, infection, hypertension and obstructed labour
- Antenatal care to help identify and manage current and potential risks and problems
- Good obstetric care that is accessible and efficient
- Post-partum care to treat post-partum problems, appropriate advice on breastfeeding, infant care, hygiene, immunizations, family planning and maintaining good health

Read more about safe motherhood in section four of this unit as well as units two and three of this module.

Family Planning

Family planning helps save women and children's lives and preserves their health by preventing untimely and unwanted pregnancies and reducing women's exposure to the health risks of childbirth and abortion. These women, who are often sole caregivers, will consequently have more time to care for their children and themselves.

Characteristics of Good Family Planning Programmes

- Strong government support
- Well trained providers who are sensitive to cultural conditions, listen to patients needs and are friendly and empathetic
- Affordable services, which provide a wide range in the choice of contraceptive methods, for instance, oral contraceptive, IUCDs, injectables, implants, male and female condoms, emergency contraceptives and voluntary surgical contraception
- Counselling, which ensures informed consent in contraceptive choice
- Privacy and confidentiality
- Clean and comfortable facilities
- Prompt service

You will learn more about family planning in unit four of this module.

'All couples and individuals have the right to decide freely and responsibly the number and spacing of their children and to have access to information, education and the means to do so.'

Management of STIs

Owing to biological reasons, women are more vulnerable to STIs than men. The burden of disease from STIs (excluding HIV/AIDS) is more than three times higher in women than men. Anatomical differences make reproductive tract infections more easily transmitted to women than in men, and when symptoms do occur in women, they are more advanced and serious. Because of their low social status and economic dependence on men, many women are unable to negotiate the use of condoms as a STI prevention measure. This is significant, especially given that HIV/AIDS is a leading cause of death in this country. The AIDS pandemic is causing untold suffering in individuals, families and societies and has been declared a national disaster.

Reproductive health programmes can reduce levels of STIs, including HIV/AIDS, by providing information and counselling on critical issues such as sexuality, gender roles, power imbalances between women and men, gender based violence and its link to HIV transmission. Service provision includes distributing female and male condoms, preventing, diagnosing and treating STIs, developing strategies for contact-tracing and referring people infected with HIV for further services. This topic will be discussed at length in unit five of this module.

Adolescent/Youth Sexual and Reproductive Health

Reproductive health of adolescents/youth is an area that has not been addressed effectively in the past. Many times young people feel that their needs are neglected. Young people, especially between the ages of 10 - 24 years, have special RH needs. In order to cater for their requirements you should be able to provide services that:

- Recognise the importance of health education and give services to meet the needs of adolescents both in and out of school. Integrated sex education and services for young people should include family planning information and counselling on gender relations, sexually transmitted diseases and HIV/AIDS, sexual abuse and reproductive health rights
- Ensure that health care programmes and providers attitudes allow adolescents access to RH services and information
- Support efforts to eradicate female genital mutilation and other harmful practices, including sexual abuse, trafficking of adolescents for forced labour, marriage and commercial sex
- Socialise and motivate boys and young men to show respect and responsibility in sexual behaviour (MoH 1996)

You will find more information about this topic in section two of this unit.

Gender Issues and Reproductive Health Rights

Gender refers to the socially constructed roles of men and women in a society. Reproductive health does not affect women alone. It is a family health and social issue as well. Unequal power relations between men and women often limit women's control over sexual activity and their ability to protect themselves against unwanted pregnancy and sexually transmitted infections including HIV/AIDS. In this regard, adolescent girls are particularly vulnerable. For reproductive health services to be successful, they must address the dynamics of knowledge, power and decision making in sexual relationships in the community.

As a health worker, you need to understand that reproductive health is a right. The community needs information and education to enable them to end all forms of gender inequality and discrimination that contribute to the perpetuation of harmful practices. This topic will be covered in more detail in section three of this unit.

Cancer of the Reproductive Organs

Cancers of the cervix and breast are the leading malignant diseases among women in Kenya while cancers of the prostate and testis are the most common in men. Early detection is important for reduction of mortality and morbidity associated with these cancers. In Kenya access to cancer screening remains very limited, especially for the rural and urban poor. Integration of cancer prevention in reproductive health programmes should be key strategy towards making such services more accessible to women and men. Health care workers especially nurses and midwives should be adequately trained on techniques of aided or unaided visual inspection of the cervix as these can lead to early detection of suspicious cases.

The main goal is to reduce morbidity and mortality associated with the common cancers of the reproductive organs in men and women. The objectives to achieve this goal include:

- Reduce morbidity and mortality from cancers of reproductive health organs through early detection and early treatment
- Establish facilities for screening and treatment of cervical pre-cancer lesions
- Ensure 15% of women aged 30 to 49 (high risk) are screened annually
- Referral facilities for basic management of cancer patients are maintained and strengthened

Prevention and Management of Infertility

Infertility is a serious public health concern in Kenya. Although it afflicts many couples and individuals the problem has been inadequately addressed both at policy and at service levels. Infertility is defined by the World Health Organisation (WHO) as follows:

a) Primary infertility: the woman has never conceived despite

unprotected intercourse for at least 12 months.

b) Secondary infertility: the woman has previously conceived but is subsequently unable to conceive within 12 months despite unprotected intercourse.

c) Pregnancy wastage: the woman is able to conceive but unable to produce a live birth.

Infertility has gender implications and regardless of the cause the woman bears the major brunt of blame and social discrimination.

The main goal in prevention and management of infertility is to reduce the incidence of infertility and facilitate proper investigation and management of infertile individuals and couples. The main objectives have been set as follows:

- Advocate for recognition of infertility as a public health issue and its management an integral component of reproductive health services
- Reduce prevalence of secondary infertility
- Reduce the prevalence of curable STIs
- Effectively manage at least 80% of curable cases of STI presenting in health facilities (WHO/AFRO)
- Increase access to effective postpartum and post-abortion care services
- Increase access to improved investigation and management of infertility
- Increase access to training in improving management of infertility

Care of the Elderly

The elderly population is on the increase and they have various health problems that affect them. Problems of menopause and andropause affect both the physical and psychological well being of the elderly in the community. This in turn has an effect on their social economic productivity, those affected are at their peak in life i.e. as early as 50 years of age. Integration of care of the elderly, especially issues related to menopause and andropause in reproductive health programmes would go a long way in addressing this area of health care.

The Ministry of Health's Approach to Reproductive Health

In order to address the aforementioned components, the Ministry of Health (MoH) felt that the reproductive health approach should focus on the following:

- Reorientation of the entire health care provision system through enhanced training
- Identification of the types of services to be integrated and the levels of service delivery involved
- Identification and documentation of the collaborating institutions, other stakeholders, providers of reproductive services and availability of resources at various levels

It is important to pay attention to cross cutting issues (holistic approach), which are critical in not only reducing the burden of disease imposed by reproductive health related conditions but also in increasing the coverage and quality of service improvement and provision.

The design of this training material has, therefore, been redirected to focus on assisting you to develop actual and potential capabilities in the provision of comprehensive and integrated reproductive health care at all levels of the service delivery system, in any setting you find yourself, including government, NGOs and the private sector.

The Structure of Reproductive Health Care Services

The Government of Kenya through the Ministry of Health aims at improving health services by making them affordable and accessible to the community. This is made possible in several ways including, through the decentralisation of services and the use of mobile clinics where available.

Community Level

This is the first level of service provision and it involves people from the grass roots. The Community Health Nurse works closely with service providers in the community in the following areas:

- Mobilising the community and participating in the provision of reproductive health services (preventive and proactive including safe motherhood, family planning, STIs/HIV/AIDS) and reporting at health centres.
- Identifying community owned resource persons (CORPs) such as teachers, clergymen, Community Based Distributors (CBDs) and government field workers to provide IEC. All these people can reach their own communities easily and disseminate reproductive health issues identified by the people.
- Supervising the provision of antenatal care, delivery of services and family planning by CBDs, the treatment of minor ailments by community health workers (CHWs) and the counselling of adolescents.

Local Dispensaries (Primary Level)

This is the second level where the Community Health Nurse manages the services. It includes the following:

- Provision and supervision of IEC materials on various reproductive health issues given by a trained health professional at the facility.
- Provision of reproductive health services such as counselling, clinical services including antenatal care, postnatal care, family planning, syndromic diagnosis and treatment of STI's, identification of symptoms and signs of infertility, cervical and breast cancer and referral of cases.

Health Centre (Primary Level)

Here the Clinical Officer is in charge but works hand in hand with the Community Health Nurse. The activities include all of those described at the above two levels as well as:

- Management of mothers during pregnancy, labour and delivery,

postnatal care STIs/HIV/AIDS and related opportunistic infections.

- The use of simple laboratory facilities for screening, diagnosis and management of STIs, opportunistic infections, malaria, anaemia and intestinal worms.
- The identification of infertility cases and referral to secondary level for appropriate management.

District Level (Secondary Level)

The District Medical Officer of Health is in charge of both private and public health services. The District Public Health Nurse (DPHN) supervises service delivery at health centre and dispensary and assists them in all duties. All the services given at the primary level plus specialised laboratory services

- Full package of reproductive health services, involving IEC, counselling, and clinical services offering the widest range of choices of FP methods in the country.
- Specialised clinics for diagnosis and management of complications in pregnancy, labour and delivery, postnatal care which covers the neonate, incomplete abortion, gynaecological care for infertility, cancers of reproductive organs, STIs/HIV/AIDS and related opportunistic infections.
- Research testing and introduction of new technologies to improve current treatment, as well as cost effective preventive and proactive measures.
- Referral services to the national hospital and from the primary and community levels.

National (Tertiary level)

This level includes referral hospitals, which have a full range of specialists including specialists in laboratory medicine and radiology. All 'general', 'provincial' and 'teaching' hospitals are classified as tertiary. Tertiary hospitals are equipped to deal with all clinical problems referred to them.

SECTION 2:ADOLESCENT AND YOUTH HEALTH

Introduction

Although adolescents and the youth form the majority of our population, their issues have, for a long time, been ignored. Yet young people have special needs and requirements. At the fourth World Conference on Women in Beijing in 1995, it was concluded that adolescents are a particularly vulnerable group due to the fact that they are known to have:

- Inadequate level of knowledge about human sexuality
- Inadequate or poor information on quality reproductive health services
- High risk sexual behaviours
- Discriminatory social practices

In response to these insights, the GoK decided to address adolescent and youth issues by developing new strategic approaches to communication programmes to enhance positive behaviour development and adoption by young people.

In this section the biological, social and psychological characteristics of adolescents and youth are first presented. This is followed by a description of their needs and suggested methods of meeting these needs including provision of youth friendly services. This section will assist you to acquire knowledge, skills and attitudes needed to enable you to provide quality adolescent and youth friendly services.

Objectives

By the end of this section you will be able to:

- Define the terms, adolescence and youth
- Describe the sexual characteristics of adolescents
- Describe the reproductive health needs of young people
- Describe the various ways of imparting life skills to young people
- Create a plan of activities to improve the reproductive health of young people

Defining Adolescence

Adolescence is defined as the transition period between childhood and adulthood. It is a period of rapid growth and maturation as the person

reaches puberty. The most colourful years of life are the teenage years. This is a period when the youth want to be appreciated for who they are and seek affection and attention.

The onset of adolescence varies from one individual to the other, and between the two sexes. In girls, it may begin as early as 9 years while in boys it may begin at 12 years. The two sexes share an approximate range marking adolescence from 13 -1 8 years. The youth age extends up to 21 years. However, according to the laws of Kenya, a person is considered to be an adult and answerable for their own actions from the age of 18.

Physical Characteristics of Adolescence

Adolescence is marked by the development of secondary characteristics under the influence of the gonadotrophic hormone from the anterior pituitary gland.

Girls

In girls, under the influence of oestrogen some secondary characteristics develop between the ages of 12 - 14 years, although they have also been reported in younger ages of 8 to 9 years. These include:

- Breasts increase in size and are spherical in shape due to enlarged glandular tissue
- Typical female shape and contour of the body develop, that is broad hips and narrow chest and shoulders
- Hair develops in the armpits and pubic region
- Internal organs of reproduction, that is, vagina, uterus, ovaries mature and menstruation (menarche) begins
- Face may become smooth or facial pimples (acne) may develop

Boys

In boys, under the influence of androgens, secondary characteristics appear from age 12 - 14 years. These include:

- Enlarged testis and penis
- Development of armpit, pubic and facial hairs
- First ejaculation (spermache) and nocturnal emissions (wet dreams) occur
- Gain in muscular strength and weight
- Voice changes with the voice becoming deeper
- Skin problems such as acne develop and the face looks rough
- Body shape takes on typical adult characteristics, for example, broad shoulders
- Rapid growth in height depending on genetics

Sociological, Psychological and Emotional Characteristics of Adolescents

While the aforementioned physiological changes are taking place and can be observed, great emotional and psychological changes are taking place that may not be as noticeable.

Emotional and Psychological Changes Resulting From Adolescence

- Changing relationships with parents, which may involve the adolescent pulling away and becoming more independent
- Changing relationships with friends. Adolescents often imitate the values and behaviours of friends rather than those of parents and other adults. Peers are an important influence but they care more about what their friends think of them
- The relationship with the opposite sex increases as they learn how to cope with romantic and sexual feelings
- Personal feelings are also affected and there is a need to accept themselves as an independent individual
- Values and behaviours are affected. Adolescents may attempt to behave more as adults, resolving problems in a responsible manner and making decisions bearing in mind the possible consequences
- Increased interest in everyday recreational activities
- Increase in mood swings as they seek attention and want to belong and be appreciated

With this understanding, there is a need to provide adolescents and young people with guidance and counselling, especially on reproductive health issues.

Key Areas in Adolescent Sexual and Reproductive Health

Young people have special needs in all circumstances and each age group within this population (9 - 24 years) has different problems and requirements. As a health worker, you need to address the reproductive health needs of adolescents/youths diligently in order to assist them to make informed choices.
The Government of Kenya is particularly interested in the health of its young people for a number of reasons. They constitute a significant proportion of the population and the fertility attributed to them (20% of pregnant women are adolescents, aged 15 - 19 years) has a substantial impact on population growth.

statistics drawn from a number of surveys, which give a clear picture of the need for youth reproductive health services

Statistics Supporting a Need for Youth Reproductive Health Services

- 20% of Kenyan adolescents become sexually active as early as 9 - 14 years
- By 20 years of age 80% have experienced sexual intercourse
- HIV prevalence among adolescents of 15 - 19 years stands at 22.3% for females and 4.2% for males
- 10,000 schoolgirls drop out of school every year due to pregnancy, which you will agree is quite alarming, as the rate of illiteracy and poverty keeps rising

The most common reproductive health problems among this age group have been identified as:

- Early child bearing (70% prevalence rates), which is usually due to girl child discrimination in educational opportunities. Girls, therefore, opt to marry early instead of staying at home
- STIs/HIV/AIDS (45% prevalence rates), as a result of idleness among the youth due to lack of recreational facilities compounded by curiosity and peer pressure. This leads them into unsafe sexual practices and, in some cases, prostitution to earn a living
- Unsafe abortion due to unplanned and unwanted pregnancy

It has also been observed that most adolescents have inadequate information about their sexuality, which also compounds the risks of early childbearing, unsafe abortion, STIs /HIV/AIDS and subsequent risks of infertility and cancer.

most common reproductive health needs among this age group.

Reproductive Health Needs Amongst Adolescents

- Information on sexuality and reproductive health
- Access to family planning services and provision of effective methods
- Prenatal and post abortion care, irrespective of the age or marital status
- Safe delivery, preferably in a hospital with facilities for all eventualities
- Treatment of unsafe abortions, which should be discouraged, but in the event of any occurrence, post abortion care should be given to save lives
- Diagnosis and treatment of sexually transmitted diseases
- Protection from sexual abuse. Cases of sexual offenders should be reported to the authorities so that appropriate action can be taken
- Culturally appropriate guidance and counselling and or mental health services
- Education in negotiating skills to help them make informed choices and accept the consequences of their actions

In order to help the adolescent/youth enjoy good reproductive health, there is also a need to do the following:

- Develop a comprehensive reproductive health package to address youth/adolescent issues through the provision of counselling and user friendly clinics
- Promote responsible and healthy RH and sexual behaviour of the youth through counselling and guidance
- Sensitise leaders, programme managers, service providers, teachers, the community, adolescents and youths themselves, on the reproductive health needs and rights of adolescents and youths

The primary principle in working effectively with young people is to promote their participation. As a group, young people often have a ‘culture’ of their own, with particular norms and values. They may not respond to services designed for

adults. They are at a stage in life where they need to develop a sense of control over their bodies and their health. At the same time, since they are young and relatively inexperienced, they need guidance that is both sensitive and reassuring. The best way to encourage young people to participate is to develop a partnership between them and health care providers with proper regard for parental guidance and responsibilities.

Once the youths know their rights and have appropriate information, they will be able to make informed choices. Consequently, their reproductive health will improve tremendously. It is important to remember that young people are flexible, resourceful and energetic. They can help each other through peer counselling and peer education. You should, therefore, try to tap these strengths in order to be able to provide them with the necessary support.

Principles for Working Effectively With Young People

- You must understand the cultural sensitivities surrounding the provision of information and services to young people. Create awareness to communities on the need to be realistic and to give appropriate counselling.
- You should identify and encourage peer leadership and communication. As you recall, at this age peers are very important and they are perceived as trustworthy sources of information. Therefore, make use of them.
- It is essential to have links between health and community services in order to make sure that young people get the appropriate treatment for problems which might be revealed through one service but require additional assistance from another service (for example, sexual violence or unsafe abortion).
- Young people need privacy. The problems that bring them to you make them feel ashamed, embarrassed or confused. It is, therefore, important for you to create the most private space and environment possible to talk to young people.
- Confidentiality must be guaranteed. You need to maintain confidentiality in all your dealings with young people and be honest with them about their health problems.
- In most cultures, the gender of the service provider is important. A young person should be referred to a provider of the same sex.

In the next topic, you will cover some of the life planning skills that you will need to impart to the young people to help them towards a stress free adolescence.

Life Planning Skills (1 of 9)

Life planning skills refer to the information that you impart to young people to help them cope with the life challenges they meet as they grow up. Life planning skills are very handy when counselling adolescents who are facing a dilemma and trying to make an informed choice or decision.

At this stage of their lives they need good information about sexuality and reproduction. They also need to learn how to protect their reproductive health. Did you know that studies have shown that sex education leads to safe behaviour and does not encourage earlier or increased sexual activity? That is why young people should be informed about STIs, HIV and early pregnancy, and appropriate advice on services should be made available to them.

Young people also need to develop certain skills to be able to make informed, responsible decisions about their sexual behaviour. They need to learn how to resist pressure, be assertive, negotiate, and resolve conflict. As you saw earlier, peer counselling and peer education can be very effective in strengthening these skills and attitudes.

Life planning skills are divided into two components. These are:

- Values and values verification, which depends on the personality of the individual
- Decision making abilities, which depend on communication skills, for example: assertiveness and negotiation skills

Values and Values Verification

By introducing the concept of values, you help young people to identify values learned from families and communities. This helps them to explain and stand up for the values and behaviours that dictate their actions.

Values have different meanings to different people, as they are beliefs, ideas or principles that determine who you are and how you

behave. For example, a person who values their family cares about their spouse, children and home life. A person who values education will study hard and pass examinations. Thus values dictate the behaviour of individuals. The individual learns to make decisions consistent with personal values. Values are held dear and encourage self esteem in the individual. Note that you will cover this topic in greater detail in the section on gender issues and reproductive health rights.

Unfortunately some communities value practices such as wife inheritance, wife beating, female circumcision, and early girl child marriage. All of these may pose significant danger to the community in relation to reproductive health. As a healthcare provider, it is important that you discourage harmful values and advocate values that enhance good and sound health in the community.

some of the more common harmful practices that you need to discourage within the communities you work with.

Wife Inheritance

This practice risks the spread of STIs/HIV/AIDS and all their consequences. It is also one of the main causes of disharmony in the family unit.

Wife Beating

A number of women have been maimed. Often they indicate that they feel stigmatised and are thus unable to seek medical assistance/attention. Some have even suffered miscarriages and premature deliveries due to violence and sexual abuse.

Female Genital Mutilation

This brings about the risk of infection and bleeding following the operation. In the long term, it also leads to prolonged second stage of labour due to scarring of genitalia. Female genital mutilation can also result in complications of lacerations and injury to pelvic floor and high perinatal morbidity and mortality.

Early Girl Child Marriage

In many communities, girls are married long before they are mature enough to be parents. Early pregnancy presents with complications of prolonged or obstructed labour, which may result in the rupture of the uterus, as the pelvis and reproductive organs are immature. Early marriage also means high school dropout rates. This, in turn increases illiteracy and its consequences such as inability of girls, or women, to negotiate their rights due to lack of information about their health needs.

Having covered some of the negative practices associated with reproductive health and youth, here are some of the good values you should attempt to reinforce within the communities you work with.

Education of the Girl Child

A good education will enable girls to be knowledgeable and to understand reproductive and child health issues. This will inevitably contribute to a better quality of life in the community. With good education, girls and women can be empowered economically and be productive to the nation.

Abstinence

Both girls and boys should be encouraged to remain virgins and abstain from premarital sex until they get married. This will help in reducing the spread of HIV/AIDS, which is a national disaster as the majority of the youths are infected/affected. It will also reduce the risk of unwanted pregnancy and the accompanying health consequences.

You have now covered some of the practices valued by communities in some detail. However it will be useful for you to gain an understanding of where values come from and how there are some factors that may influence our behaviour and make us act in a manner that is inconsistent with our values. By understanding these factors you can help young people to examine their values and encourage them to avoid being influenced to abandon their good values.

Origin of Values

- Parents and family members, who help to instil values in the child, which will eventually become a part of an individual
- Community, which reinforces values and can discipline in case of deviations
- Religious leaders, who reinforce individual beliefs about good and evil
- Teachers in school, where education helps the adolescent to start reasoning and checking their values more clearly. The adolescent will identify mentors and try to copy them
- Friends, who greatly influence the initial values. Some succumb to negative peer

pressure but this depends on the personality of the individual

Factors that can cause people to deviate from their values.

- People often want to experiment or try somebody else's values in order to validate them and decide whether to adopt
  them or not
- Peer pressure may force the individual to do things not in keeping with their values hence they become deviant
- Opportunity for personal gain
- Opportunity to make someone else angry as well as rebel to get attention

Decision Making

Decision making is the art of making a choice out of several options. Making a decision exposes the individual to a lot of challenges as they weigh the consequences based on the choices available. Making a decision equips the young person with life planning skills. Presented below are some of the skills that an individual needs in order to make sound decisions:

- Communication, which is the art of passing information. When the youth are equipped with accurate information about themselves, they will be able to account for decisions they make. They must have good communication skills (revisit the Communication Skills topic in module one unit five).
- Assertiveness, which means being confident and able to make a stand on their words, actions or beliefs. This includes the ability to say NO to drugs or sexual advances, because illicit drugs or pre-marital sex are against their moral and/or religious beliefs.

****Assertiveness**

The skill of assertiveness is based on five rights. These are the rights to:

- Expression using the verbal, non-verbal and body expressions
- Set one's priorities by putting first things first. Accept that one's needs are just as important as the other person's and put your own needs across without fear of intimidation
- Refuse requests without feeling guilty as one defends one's values. Young people should be taught that they have the right to say no
- Judge one's behaviour and take responsibility for the consequences
- Negotiation skills

Young people need accurate information regarding reproductive health, especially related to HIV/AIDS and substance abuse. Once they know the facts and the outcomes of their behaviour, they will be able to communicate effectively, make informed choices and defend them against their peers. They must know the options available based on the consequences. Negotiation and assertiveness skills play an important role in communication as the youth make decisions, which affect their reproductive health.

The last and most important step of decision making is seeking help. Our youths need to feel free and look for information and assistance when not sure of the decision to be made. They should know where to go for assistance when they need help. This could be to their parents, teachers, religious leaders or health professionals.

These life planning skills are important to the youths. So learn them well to enable you to impart them to the young people.

Young people can make poor life decisions for a variety of reasons and these decisions have their own inherent dangers.

Drug Abuse

Drugs are mostly taken to elevate the mood and often the individual feels 'high'. In the long run drugs impair the person's ability to make sound decisions and established values may be ignored.

Unprotected Sex

Unprotected sex is often a result of the individual succumbing to peer pressure. Occasionally, decisions are made under the influence of drugs or alcohol. This adds to the risk of spreading STIs/HIV/AIDS, unwanted pregnancy, school dropout and poverty.

Crime

Lawlessness and crime, such as stealing or robbery with violence, is commonly found among people with low negotiation and assertive skills. In order to enhance the health and well being of adolescents and youths, remedial activities need to be undertaken.

Activities to Improve Adolescent/Youth Health

There are various interventions your community and the Government can undertake to improve the health of young people, thus helping them to develop confidence and become productive citizens.

Community and Government Interventions to Improve the Health of Young People

- Advocating the recognition of socioeconomic and reproductive health needs and rights of adolescents and the youth
- Establishing an understanding with youth advisory councils at all levels to coordinate and advise on youth and adolescent health
- Developing specific messages for different target groups (parents, religious and other leaders, youths and adolescents)
- Implementing youth friendly and accessible RH services to enable the youth to seek services and receive counselling without barriers. Health providers should create a conducive environment when counselling and avoid biases that discourage youths from coming to the facility
- Educating youths on their rights in order to help them attain the highest degree of health and self esteem. They should be sensitised to advocate against marriage at an early age, female circumcision, child abuse and so on. They should also advocate for the respect of good cultural values, access to RH services and the need for informed choice and privacy
- Conducting basic/applied research on youth and adolescent issues on regular basis and implementing the findings

As a health care provider you should advocate active involvement of adolescents/youth in projects aimed at promoting responsible sexuality, preventing unwanted pregnancy, unsafe abortion and spread of STIs/HIV/AIDS. The advocacy should focus on several issues. Most importantly, there should be attempts to integrate gender issues into youth programmes so that they reinforce appropriate values. Additionally, you should incorporate Information, Education and Communication (IEC) in the reproductive health programs.

Section 3: Gender Issues and Reproductive Health Rights

Introduction

Welcome to section three of unit one of the Reproductive Health module. In the previous section you discussed adolescence and youth reproductive health. You should now be well equipped to give youth friendly services in your health facility.
In this section you will cover gender first. This will be followed by a description of the influence of gender inequalities and discrimination in reproductive health. You will then address the measures that should be taken to minimise negative effects in order to improve reproductive health for women. These measures include male involvement.
It has been established that human sexuality, reproduction and gender issues are closely inter-related and together affect the ability of men and women to achieve and maintain sexual health and manage their reproductive life. You will also cover how gender issues affect access to and enjoyment of good reproductive health in our communities and what you can do to improve reproductive health rights.

Objectives

By the end of this section you will be able to:

- Identify terms used in gender issues
- Explain reproductive health rights
- Identify the forms of gender inequalities and discrimination in our communities
- Explain the effects of gender issues on reproductive health
- Describe the measures taken to improve reproductive health rights

Definition of Terms

You start this section by exploring the terms ‘gender’ and ‘reproductive health rights’.

Gender

What is meant by ‘gender’, does it simply mean male or female or does it describe more than just biological characteristics?

As a term, it has been misinterpreted to mean male or female only. Biologically, people are born either male or female but learn to be a man or a woman. However, when you talk about gender, this refers to the economic, social or cultural attributes associated with being a female or a male.

An example of a 'gender stereotype' is when, culturally or socially, women are assumed to be weak and timid and, therefore, unable to perform certain tasks or contribute to the same extent as men. In most communities, it is believed that men can be better leaders to the extent that some jobs are reserved specifically for men and are male dominated, for example, politics, administration or medicine. However, in spite of their professed dominance, it is not uncommon to see men fail miserably in some of these positions.

Thus gender stereotypes can result in certain role expectations. In most societies, being a man or a woman is not simply a matter of different biological and physical characteristics. Men and women face different expectations about how they should dress, behave or work. Relations between men and women, whether in the family, the workplace or the public sphere, are divided according to the understandings of the talents, characteristics and behaviour appropriate to men and women in that society. The most obvious illustration of this is the split between the public world of employment, work and politics, which is seen as 'naturally' male and the private arena of the family and the household which is seen as 'naturally' female.

Women in most societies are expected to take the major responsibility for domestic tasks and for the care of children, the elderly and the sick. Men, on the other hand, are allocated the primary responsibility for supporting the family.

Reproductive Health Rights

The reproductive health rights are drawn from international human rights declarations and treaties such as the Universal Declaration of Human Rights, the 1994 Cairo Programme of Action of the International Conference on Population and Development (ICPD), the Beijing Platform of Action of the 1995 World Conference on Women, and more recently by the Safe Motherhood Action Agenda (1997) for the next decade.

The 1994, Cairo Program of Action of ICPD conference defined reproductive health rights as:

' …the recognition of the basic right of all couples and individuals to decide freely and responsibly the number, spacing and timing of their children and to have the information and means to do so, and the right to attain the highest standard of sexual and reproductive health. It also includes their right to make decisions concerning reproduction free of discrimination, coercion and violence as expressed in human rights documents.'

The 1997 Colombo (Sri Lanka) Safe Motherhood Technical Consultation Committee designed strategic reproductive health interventions, which rest on a foundation of greater equity for women. Member countries are encouraged to design other non-health activities, which could improve the socio-economic status of women. Such activities include: provision of formal education for girls, giving women equal employment and business opportunities as well as empowerment of women to make decisions in their households.

Reproductive health rights and gender issues are closely interrelated and together affect the ability of men and women to achieve and maintain sexual health and manage their reproductive life. Poor reproductive health is directly related to gender based inequality in the distribution of social power and resources.

In our male dominated Kenyan society, women are denied equal access to political affairs, education, economic participation and legal powers, in spite of the fact that the legal system in Kenya in theory does not discriminate against women.

Gender Inequalities and Discrimination

Gender inequality and discrimination refers to unequal access to power, resources and opportunities in society. Gender inequality and discrimination harms the health of young girls and women, directly and indirectly, throughout their life cycle. The neglect of their health needs through, for example, overworking and poor eating habits, makes them vulnerable to chronic ill health, which prevents many women from fully taking part in society. Unequal power relations between men and women often limit women's control over sexual activity and their ability to protect themselves against unwanted pregnancy

and sexually transmitted diseases, including HIV/AIDS.

The subordinate status of women goes far back. The place of women in society has never been equal to that of men. In the Christian Bible, it is said that the Jewish community in which Jesus was born and later ministered had very little regard for women compared to their male counterparts. A woman could be divorced at her husband's request without objections.

In African society, sociocultural factors tied with traditional beliefs and practices play a great role in determining the place of women in almost all spheres of their lives. This influence begins with the socialisation of young children both within and outside the home. At childhood, both boys and girls are introduced to societal beliefs, practices and values as they apply to each gender. Boys are supposed to become heads and protectors of the family. The girls become wives and mothers, dependent on their husbands. These gender inequalities between sexes lead to women's subordinate positions within the family.

Before you continue, reflect briefly on the type of gender inequalities you have observed in your community.

Examples of Gender Inequalities

You may have observed the following inequalities:

- Inequalities in education
- Inequalities in the labour force
- Access to medical care
- Law of succession
- Cultural practices (such as female genital mutilation, polygamy and wife inheritance)

You will now look at different manifestations of gender inequality in detail.

Preference for the Male Child

Since time immemorial, the boy child has always been preferred over the girl child in the African culture. It is perceived that the boy has more economic value than the girl. The boy is viewed as an asset that can contribute wages through his labour and provide for the care of parents in old age. Customarily, inheritance and lineage is passed through sons. In many communities, girls and women cannot inherit anything even from the husband and in some societies only boys participate in religious ceremonies.

Girls, on the other hand, are seen as a liability. Parents see no need in investing in them, as they will leave the homestead to get married and provide hard labour benefits to the husbands' side. This poses a great risk to the girl child and her reproductive health right from conception. For example, today with modern technology where sex can be predetermined, it has been noted that out of 8,000 pregnancies terminated annually, only one foetus is a male. In countries where abortion is illegal, infanticide is on the increase, and where girls are born they are often severely neglected.

Education

Parents prefer to educate sons. Why? Women are considered to be a liability. Remember the saying about watering a plant in the neighbour's garden? Some people view educating girls as a waste of money as they will get married and leave the homestead. Others believe that women cannot excel, and in any case, men are the breadwinners in the family.

Global statistics on literacy show that women still outnumber men by two to one among the world's illiterate people and girls constitute the majority of the 130 million children without access to primary school education. Girls who are denied education end up illiterate and with low self esteem. They get into early marriages to avoid frustration. Once they are married, they have little or no economic power. Further, reduced education and economic power have immediate negative effects on children's nutritional status, health and development, on the mother's health and on the size of the family.

Food

Traditional practices, which dictate the kinds of foods that can or cannot be eaten by girls, may lead to malnutrition and stunted growth with several consequences, including the possibility of girls developing a small pelvis. This has serious repercussions for a woman's reproductive health and may lead to anaemia, and obstetric complications during childbirth.

Access to Medical Care

The female child, when sick is often denied prompt medical attention. In some countries girls are breastfed for a shorter period hence denying them the necessary nutrients from breast milk. Sometimes the mother is forced to stop lactation early to get pregnant, because the family is trying for a son. This leads to chronic ill health with serious complications, which result in increased morbidity and mortality. All these

factors make it difficult for the girl child to stand out and excel.

Denial of Other Basic Rights
In addition to denying the aforementioned rights of education, food and healthcare, females in some societies have no right to:

- Own land or to inherit property
- Obtain access to credit
- Earn income and promotion in their work
- Have access to services that meet their sexual and reproductive health needs

Girls are often subjected to various other discriminatory practices, which, directly or indirectly, deny them their rights. These can include Early Marriages, Female Genital Mutilation, Polygamy and Wife Inheritance.

Early Marriages
Girls in some communities are forced to marry early so that the father can acquire bride wealth. Research has shown that early marriage exposes the girl child to early sexual activity, which in turn predisposes her to cancer of the cervix, obstetric complications and ill health.

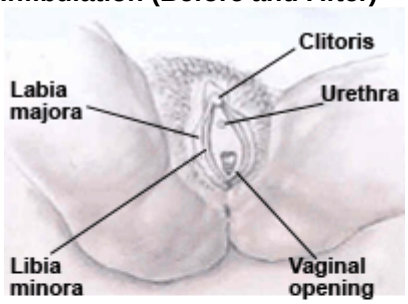
Female Genital Mutilation (FGM)
This is also known as female circumcision. It is practiced in several countries in Africa and the Middle East. It is estimated that about 130 million girls are currently living with the effects of FGM. A further two million girls are at a risk of the practice. Societies that practice FGM believe that it is an initiation into adulthood and prevents the woman from becoming promiscuous.

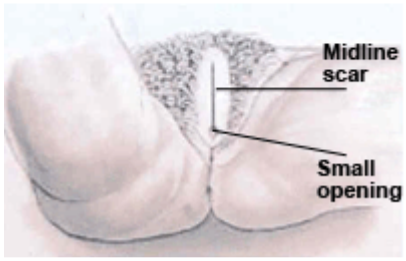
There are four types of operations involved in FGM

The Four Types of Female Genital Mutilation

- Circumcision, which involves cutting of the prepuce or hood of the clitoris
- Excision, which involves the cutting of the clitoris and all or part of the labia minora
- Infibulation, which involves the cutting of the clitoris, labia minora, and part of labia majora. The two sides of vulva are then pinned together with silk, catgut sutures, or with thorns, thus obliterating the vaginal introitus except for a small opening, preserved by inserting a piece of wood or reed for passage of urine or menstrual blood. The girl's legs are bound together from hip to ankle and she is kept immobile for 40 days to permit the formation of scar tissue
- Intermediate, which involves the removal of the clitoris and some or all parts of the labia minora

Infibulation (Before and After)





All of these operations present serious consequences to the reproductive health for girls and women.

The Potential Health Consequences of FGM

- Medical complications such as haemorrhage, pain, pelvic infection, and painful intercourse
- Complications of childbirth such as obstructed labour due to scarring of tissues. In some communities the husband must give consent before an episiotomy can be performed
- The procedure also denies the woman enjoyment of sexual life as the clitoris plays a role in reaching orgasm
- FGM also predisposes girls to early marriage since after the initiation they are considered mature and can get married. Early marriage, as you said earlier, has negative consequences on their RH as it exposes them to early pregnancy. If contraception is not used, the girl may have many deliveries, which predisposes her to various risks, including cancer of the cervix (Miranda)

Wife Inheritance
This is a cultural practice whereby a woman whose husband has died is inherited by a brother or relative of the late husband. The aim of this practice is to maintain the family lineage. In the past this custom was beneficial to some extent, as it provided stability and security to the woman and her children. However, today, it has been abused. Most men look for widows from rich homes so that they can exploit their wealth. Also, this practice has led to the death of whole families because it facilitates the spread of HIV/AIDS.

Polygamy
Polygamy is also a very common practice in some parts of Africa whereby men are allowed to marry more than one wife. Polygamy creates conflicts in the family and enhances the spread of STD's/HIV/AIDS.

Gender Violence

Did you know that around the world, at least one in every three women has been beaten, coerced into sex, or abused in some other way, most often by someone she knows like a husband or male relative? This is what is called gender violence.
Gender based violence is recognised today as a major issue on the international human rights agenda. As you well know, in some communities, the right of a husband to beat or physically intimidate his wife is a deeply held conviction. Indeed, there are women who often view a degree of physical abuse is justified under certain conditions. Justification for violence comes from gender norms, which give a distorted view about the roles and responsibilities of men and women in relationships. For instance, men who engage in domestic violence are motivated by the desire to demonstrate their masculinity or enforce their male power and control over the women. That is why experts have adopted the term gender based violence to describe this type of violence.
Although violence against men does also occur, it is extremely rare. However, violence against women and girls is very common and on the rise. According to the World Bank, violence against girls and women throughout the world causes more death and disability among women in the 15 - 44 age group than cancer, malaria, traffic accidents, and even war.

The dictionary definition of violence is: 'using or tending to use aggressive force'. Another important word for you to know is 'abuse'.

Abuse may be defined as: 'a systematic pattern of behaviour in a relationship that is used to gain and/or maintain control and power over another'.

Abuse ranges from emotional abuse such as hurting another person's feelings; psychological violence such as threats to do bodily harm, physical abuse such as hitting to cause pain or injury, and sexual abuse which includes rape, defilement and incest. For the purposes of this section the terms 'violence' and 'abuse' will be used interchangeably.

Violence Against Women
Violence against women includes a wide range of abuse and harassment and may take place throughout a woman's lifetime as shown in the table below.

Gender Violence Throughout a Woman's Life (Source: Heise, 1994)	
Phase	**Type of Violence**
Prenatal	Sex-selective abortions, battering during pregnancy, coerced pregnancy (rape during war)
Infancy	Female infanticide, emotional and physical abuse, differential access to food and medical care
Childhood	Genital cutting; incest and sexual abuse; differential access to food, medical care, and education; child prostitution
Adolescence	Dating and courtship violence, economically coerced sex, sexual abuse in the workplace, rape, sexual harassment, forced prostitution
Reproductive	Abuse of women by intimate partners, marital rape, dowry abuse and murders, partner homicide, psychological abuse, sexual abuse in the workplace, sexual harassment, rape, abuse of women with disabilities
Old Age	Abuse of widows, elder abuse (which affects mostly women)

Violence against women has been called 'the most pervasive yet least recognised human rights abuse in the world.' That is why the Vienna Human Rights Conference and the Fourth World Conference on Women gave priority to this issue. Violence exposes women's lives, bodies, psychological integrity and freedom to danger. Violence has serious effects, either directly or indirectly on a woman's reproductive health.
Negative effects of violence to a woman's reproductive health include:

- Unwanted pregnancies and restricted access to family planning information and contraceptives
- Unsafe abortion or injuries sustained during an illegal abortion after an unwanted pregnancy
- Complications from frequent, high risk pregnancies and lack of follow up care
- Sexually transmitted diseases, including HIV/AIDS
- Persistent gynaecological problems
- Psychological problems, including fear of sex and loss of sexual pleasure

Gender based violence also helps to perpetuate male power and control.

Learnt Behaviour
Did you know that 70% of batterers come from violent home backgrounds? Violence is a learnt behaviour. Witnessing violence as a child is a common risk factor for becoming a batterer in adulthood. A recent survey has shown that over one-third of Kenyan families are currently living in abusive relationships. Can you imagine the negative consequences on their children?

Aggression
Violence is an expression of aggression, which is defined as any behaviour directed towards harming another living being which is a product of nature and nurture. The behaviour may be physical or psychological and intentional. There are two types of aggression:

Hostile Aggression occurs when a person is angry or annoyed with someone else. Most murders are said to be impulsive and emotional. A robber may attack a victim to achieve their goal.

Instrumental Aggression is performed when the perpetrator does not have to be angry and uses aggression only to achieve their goal.

A person's genetic makeup is thought to influence aggressiveness, according to the theory, when certain areas of the brain (the hypothalamus) are stimulated it activates or inhibits aggression. There are also situations that trigger aggression; viewers of violent television and pornographic films are likely to be provoked to behave aggressively. The link has not been established fully but young viewers are known to imitate the older ones.
You will learn more about aggressive behaviour in module five in the unit on mental health. You will now look at the different forms of violence and abuse.

Forms of Violence/Abuse

Abuse and violence may take various forms. Some cases of violence end up in murder, suicide or incapacitation. Battering and assault are on the increase. It is estimated that 30% of rape victims are also battered women. You will now look at each form of abuse separately.

Physical, Emotional and Psychological abuse

Physical Abuse
Physical abuse involves aggressive behaviour towards another person, such as, pushing, pinching, spitting, kicking, biting, pulling hair, slapping, hitting, punching etc.
These are only a few examples. Other possible physical abuse involves the use of weapons like guns and belts to cause injury to another person.

Emotional Abuse
This type of abuse involves hurting another person's feelings, for example, through repeated harassment, interrogation or degradation.

Psychological Abuse
Psychological abuse can include verbal threats, in the form of violent language, isolation, deprivation, and property destruction such as clothes or furniture. Most victims feel intimidated and can go into a state of depression or become aggressive in self-defence.

Economic Abuse Against Women
Now that you have gone through the first three forms of abuse, STOP and THINK.

In your community, who holds the economic power or has the say in terms of money and property?

How is workload shared between males and females? Is it not usually the case that, the man has the economic power and women and children do the bulk of the job and for longer hours? Patriarchal structures relegate women to an inferior status in political, social, intellectual and economic spheres. In the economic realm, women experience abuse worldwide.

The value of women is often seen only in relation to that of men. For example, a girl's value is seen in terms of the bridal wealth that benefits the father and brothers. Hence women's humanity is reduced to a mere materialistic gain. The male perception of women is greatly influenced by the cultural gender roles that are determined by men.

Women are burdened by the multiple duties they have to perform. In addition to raising their children, they continue to be weighed down by the full burden of household chores and lowly paid labour. Due to socially defined gender roles, mothers are forced to carry their babies to their place of work while their husbands are resting at home. The babies are sometimes fed under unhygienic conditions thereby subjecting them to infection like diarrhoea. The health hazards are an additional responsibility to the mothers.

The agricultural sector, which engages most women, gives them less pay for equal work with men. It should also be pointed out that gender roles limit women's opportunities to get better paying jobs.

Often, they can only engage in low wage professions. In contrast, men dominate better paying and prestigious jobs. Many women have no access to independent income, while those who do earn their own wage, receive on average around three quarters of the comparable male salary (UNDP, 1995). Work that is done at home by women is deemed to be of less value than waged work and those who perform it are treated accordingly.

Currently in the rural areas, women act as heads of homesteads since most husbands work in the urban areas. They till the land and tend to the crops, yet they neither share nor have a say on how the money from the sale of the crops is spent. In many communities, girls cannot inherit land from their fathers. As a result there is inequality in the distribution of income and wealth. Around the world, women now make up about 70% of those who are poor (UNDP, 1995).

Women's economic problems are worsened by the death of a spouse. In some communities in Kenya, the in-laws subject widows to immense economic abuse. The community's funeral rites demand that the deceased's property be distributed to close relatives with a view to keeping the deceased's spirit among them. This property sharing ritual thus enhances the men's economic status at the expense of the widows. Widows have been known to lose a house that they contributed money to build. These conditions leave the woman with a very weak economic status.

You can, therefore, see that there are various constraints to women's economic advancement. Women invest a lot into their families with little recognition of their manifold role. They are not paid for all this work. In the event of sickness, women are unable to afford proper medical care. This tends to reduce their productivity.

Additionally, despite women's involvement in tilling the land, they do not have direct access to it. They own land through relatives, or husbands, or sons. They do not inherit land even upon the demise of their spouses. Women also have low income jobs. This is because men have a head start in education, which enables them to qualify for better jobs. This limits women's ability to raise capital or get access to credit facilities due to lack of security. Consequently, women have to depend on their husbands for economic support if they want to engage in money generating projects.

Another constraint to women's economic advancement is their lack of active participation in political field. Gender roles demand that men be leaders. As a result, women with leadership qualities cannot easily venture into it since leadership is considered a male domain.

As you can see, economic violence is a major set back to women's advancement. You as a service provider need to advocate for fairness on matters affecting the majority.

Actions You Can Take to Help With Economic Reform

- Paying women just wages for the work done rather than stereotyping them as the weaker sex
- Devising ways of reducing women's workload thus enabling them some leisure time
- Putting pressure on the government to change policies and laws that deny women equal ownership of family assets

- Encouraging women to join income generating activities with a view of increasing their economic status
- Putting pressure on the government to punish all those individuals who misuse children through labour and force girls into early marriage

Sexual Abuse/Violence

Sexual violence has been defined as: 'any sexual act, attempt to obtain a sexual act, unwanted sexual comments or advances, or acts to traffic women's sexuality, using coercion, threats of harm or physical force, by any person regardless of relationship to the victim, in any setting including but not limited to home and work' (National guidelines: Medical management of rape and sexual violence 2005).

This form of violence renders the victim helpless, traumatised and debilitated. The majority of victims end up infected with STIs including HIV/AIDS. The various forms of sexual abuse found in our society include:

- Forced fondling
- Touching and verbal remarks
- Incest
- Molestation
- Forced prostitution
- Oral/genital contact or fondling of genitals and breasts
- Rape
- Female genital mutilation

The two most common forms of sexual abuse found in our society are sexual abuse of children and rape (which may target children, a large majority of women and, occasionally, men).

The majority of sex abuse victims are children, because they are unaware of the intentions of their abuser and the significance of the abuser's actions. According to a survey carried out by Population Communication in Africa, three-quarters of sexual abuse in infancy occurs at the age of four to five years. 53.8% of abused children were abused at the age of five. Mostly victims tend to know their abusers. They may even be family members.

According to the Centre for the Rehabilitation and Education of Abused Women (CREAW), the unbelievable stories of children, even infants, being sexually violated by family members are becoming more common.

Child sexual abuse occurs when a person older or stronger than the child uses their power, authority, or position of trust to involve a child in sexual activity. Children are often also victims of incest. Incest is common and is defined as any sexual activity between a child and a parent, a sibling, an extended family member or a step parent. Sexual abusers are often men who are married with children and respectable jobs. The child may be enticed by material things or goods especially edibles.

A sexually abused child suffers damage and a permanent psychological scar is left in the child. Feelings of guilt, shame and worthlessness are common results of the social or psychological trauma which becomes entrenched like a thorn in the victims. Most of these children end up as social deviants. For example, a USA study showed that 60% of prostitutes were once abused when they were children. Some become depressed, or turn to alcohol and drug abuse to try and hide their feelings of shame, guilt, and low self esteem.

Every child has the right to a good life. Parents have a responsibility for protecting and nurturing their children as they are growing up.

Rape

Rape is defined as unwanted sexual contact of a woman's body perpetrated by one or more persons. This contact can be either with a part of a body or an instrument. Vaginal and oral penetrations are included. Therefore, one can say that rape is the sexual penetration of a person without prior consent. Rape is a major tool of violence against women. A study in Central America reveals that approximately one out of five women expect to be raped or sexually assaulted in their lifetime. At least one in three women will experience a violent relationship with an intimate partner.

The act of rape is a denial of women's right of self preservation. Rape is an act of coercion that forces women into doing something harmful to them against their own will. The rapist intrudes into the victim's personal domain in a harmful way without her consent. It is a violation of the woman's right to privacy. Rape is more of an expression of hatred towards women than it is a result of sexual desire. It is first and foremost a crime of violence against the body and secondly a sex crime. It is humiliating to the victim and is frequently accompanied by violence, forced sodomy and similar acts. The victims of rape are chosen indiscriminately and range from elderly women to infants.

Rape has become the prevalent form of sexual violence in our society today. This form of sexual violence is of great concern to all decent human beings. The fear of rape definitely influences the behaviour of women and generally rape

offences have increased. Knowledge of the incidence of rape needs to be widespread if it is to be taken seriously. Although there seems to have been some progress in recent years, with the police striving to be more sympathetic with victims, you still have a long way to go in view of current lenient sentencing policies.

One of the common assumptions about rape is that it is a crime induced by women who are sexually seductive. On the contrary, Brown Miller discovered that rape rarely has anything to do with sex or sexual seductiveness of women but has everything to do with power. Her research findings indicate that men use their superior physical strength, and their ability to rape, as a constant threat to keep women dependent and in need of protection.

It is important to note that rape is not confined to anonymous or non-marital sexual violence. Rape also takes place within conventional marital relations. According to the 1st Annual Report of London Rape Crisis Centre, the majority of battered women and many women in so called 'normal marriages' describe their sexual relations with their spouses at times as rape. The report further adds that sometimes sexual damage leads to conflict which precipitates domestic violence. However, legal inequalities protect husbands from charges of raping their wives.

By encouraging male superiority and constantly belittling females in society, it becomes possible for men to abuse their positions of power not only by oppressing them but also sexually abusing them.

'Rape can be seen as a product of the unequal power relations existing between the sexes, written into the codes of conducts passed on to us as masculine and feminine models'. C. Roberts

Hence the social status of women is a factor in creating their vulnerability though it does not create rape. The government has developed the National guidelines: Medical management of rape and sexual violence 2005. Health care workers should familiarise themselves with it in order to act appropriately when such victims seek care.

Effects of Gender Issues on Reproductive Health

By now it should be obvious to you that gender issues have significant impacts on reproductive health, including: homicide, serious injuries to the victim and dependants (children), STD's/HIV/AIDS, unwanted pregnancies, mental health problems and suicide. The different health impacts can be grouped into three categories:

- Physical
- Psychological
- Social

Each of these categories is explored in detail in the following pages.

Physical Consequences

Unwanted and Early Pregnancy

This can either be through rape or by the woman not being able to negotiate contraceptive use. Some women may be afraid to raise the issue of contraceptive use with their sexual partners, as they fear being beaten or abandoned for assumed promiscuity. Adolescents who are abused during childhood are more likely to develop a sense of low self esteem than those who have experienced no abuse. They are more likely to neglect themselves and engage in risky behaviours such as early unprotected sexual intercourse. They are exposed to early pregnancy outside the childbearing age when they are biologically and psychologically immature. There is a high risk to both mother and foetus with high incidence of premature infants, as well as a risk of criminal/unsafe abortion, which can cause fatality.

Serious Injury

Many assaults or domestic violence incidents result in injuries ranging from bruises and fractures to chronic disabilities. There have been cases where husbands gorge women's eyes out, or knock their teeth out. In other cases, metal objects may be pushed inside their genital tract. The injuries sustained cause permanent disability or even death.

Injuries During Pregnancy

Violence during pregnancy poses a risk to the health of both the woman and the foetus, resulting into premature birth, abortion, poor weight gain, infection, pregnancy induced hypertension and anaemia.

Vulnerability to Disease

Compared to women who have not been abused, women who have suffered any kind of violence are more likely to experience a number of serious health problems. These include

chronic pelvic pain, severe menstrual problems, STIs or urinary tract infection. The vulnerability to illness is associated partially with lowered immunity because of increased stress levels resulting from the abuse.

Contraction of STIs/HIV
Apart from unwanted pregnancy, women are vulnerable to contracting sexually transmitted infections (STIs) including HIV/AIDS, as they are unable to negotiate protection. Pregnant women have a higher risk of sepsis, spontaneous abortion, and premature birth. Some STIs increase a woman's vulnerability to HIV/AIDS. In addition, violent sexual assault may result in tears in the delicate vaginal tissue, which allow the virus easier entry into the blood stream.

Injury to Children
Children in violent families frequently become victims of abuse as they are injured when they try to defend their frail mothers.

Homicide
Studies have shown that most female homicide victims were either killed by their partners or ex-partners The violence usually begins with threats and may end in forced suicide, death from injuries, or actual murder.

Psychological Consequences
Violence is a kind of terrorism, which severely limits the freedom of women and makes them dependant on men. Violence, especially rape, leaves emotional and psychological scars. This may have several consequences.

Mental Health Problems
Research has shown that battered women endure enormous psychological suffering, which results into severe depression or anxiety. Some women may display symptoms of post-traumatic stress disorder (PTSD). They are fatigued, suffer insomnia, have nightmares or eating disorders. Some women turn to smoking, alcohol and drugs to numb their pain or become isolated and withdrawn.

Suicide
As mentioned earlier, women who are battered (beaten) or sexually assaulted suffer emotional and physical strain, which could lead to suicide. They find suicide the only option of escape from violent relationships.

Social Consequences

Added Health Care Costs
The cost to society due to violence against women is tremendous in terms of health care alone. A proportion of these costs are for treating physical injuries. A substantial amount is also spent on treating psychological problems, including anxieties and symptoms which happier, more confident women may be able to tolerate, ignore or shrug off.

Other Costs
Indirectly related costs include those incurred by the police, courts, and legal services to prosecute offenders as well as costs of child protection services.

Effects on Productivity and Employment
Women play a big role in the economy of our country. Their productivity is affected due to violence, as they cannot engage in productive work when they are sick or injured. Women who are abused by their husbands cannot perform well at work, hence they do not advance in their careers. Similarly, girls who are victims of violence are likely to be anxious or depressed and unable to perform to the best of their ability at school.
I hope you are now quite knowledgeable about the significance of gender issues on reproductive health. The pattern of inequality brought about by gender roles in our society is a constraint to the progress of women because it limits the opportunities of achieving their full potential. When women are constrained from reaching their full potential, that potential is lost to society as a whole.

Improving Reproductive Health and Rights: Gender Involvement

What are some of the key areas of action that can help us to improve reproductive health and women's health rights? They include the following:

- Women's empowerment and their full participation in all spheres of society, including participation in the Decision making process and access to power are fundamental for the achievements of equality, development and peace.
- The ability of women to control their own fertility forms an important basis for the enjoyment of their rights.

- The involvement of both men and women. Human sexuality, reproduction and gender issues are closely interrelated, and together, affect the ability of men and women to achieve and maintain sexual health and manage their reproductive life.

details of strategic approaches that can be used to tackle gender issues and reproductive rights in Kenya.

Strategic Approached to Tackle Gender Issues and Reproductive Rights

- Intensification of IEC and advocacy activities against harmful practices, such as female circumcision, early marriage, wife inheritance, polygamy, and rape. You can help to end the 'culture of silence' by focusing on legislators, community leaders and women themselves.
- Increasing public awareness on the value of the female children and hence the need for equal treatment of girls and boys in health, nutrition, education, socioeconomic and political activity and equitable inheritance rights.
- Promotion and encouragement of equal participation of men and women in all areas of family and household responsibilities, including family planning, child rearing and housework through information and education. Efforts should be made to ensure the provision of maternity/paternity leave for women and men to assist one another.
- Advocacy for the elimination of all barriers and inequities to women's participation in the work force to ensure that women can buy, hold and sell property and can negotiate for contracts.
- Lobbying for the reform and enforcement of laws of marriage to ensure marriage is entered into with full consent of both individuals at a minimum age of 18 years. Child marriage should be eliminated.
- Advocacy for the elimination of all forms of violence against women, youth and children including domestic violence, rape, all forms of exploitation and harassment. Furthermore, procedures should be established to encourage victims to report violations of rights and the setting up of adequate remedies and penalties.
- Increase the awareness and involvement of women in these activities so that they can become more aware of their rights.

You will now address the role of the health worker in promoting reproductive health and rights and contributing to the prevention of sexual abuse within the community.

The Role of the Health Worker

As an agent of change in your community, there is a lot you can do for both the victim of abuse as well as the society. In relation to the victim, it is important that you:

- Are understanding and sympathetic and provide emotional support
- Are attentive and observant to identify signs and symptoms of abuse and follow up
- Provide appropriate medical care and document in the patient's medical records the type of abuse and details of perpetrator to repair damaged self esteem
- Refer patients for counselling and to available community resources for her safety and that of her children. If need be, advise the patient on legal procedures and refer to the police for obtaining of an abstract
- Maintain privacy and confidentiality of patient information and records
- In case of rape, provide counselling and emergency contraceptives to prevent unwanted pregnancies

Considerations When Dealing With the Community

- Hold abusers accountable, irrespective of their social status, education or wealth
- Believe victims and assist with food, shelter or refuge
- Victims should be encouraged to report immediately to a health facility or police station without bathing or destroying garments for evidence purposes
- Involve appropriate authorities to step in and stop the violence cycle
- Approach marriage counsellors and spiritual leaders where applicable

- Identify potential batterers and assist them in seeking professional help
- Sex education at all levels ought to be taught to foster family values, respect and dignity of the person. Stress personal responsibility, promote wholesome relationship and recognise the individual's rights
- Society, through its legal structures, law enforcement programmes and court systems must stand firm against sexual abuse, especially in cases of rape, violent misuse of children, particularly baby girls, spouses and other victims
- Male attitudes towards gender and sexual relations arise in boyhood, when they are often set for life. Boys should, therefore, be targeted early with IEC

SECTION 4: SAFE MOTHERHOOD AND CHILD SURVIVAL INITIATIVE

Introduction

Safe motherhood is neither a simple nor a single concept, and what is encompassed by the term has evolved considerably since 1987. While the focus on maternal mortality has remained, three other outcomes have now been incorporated.

- Maternal morbidity
- Health of the newborn
- Positive health of the mother

Thus, the meaning of safe motherhood has broadened, particularly in the early 1990s as has the range of factors regarded as determinants of poor maternal health, with women's low socioeconomic status seen as one of the root causes.

The Safe Motherhood mandate for the reproductive health programme is assumed to span across the continuum of pre-conception care, antenatal care, labour and delivery, postpartum and postnatal care and neonatal care (first month of life). The RH policy recognises that in at least 15% of pregnant women serious obstetric complications can occur that usually can not be predicted or prevented in advance, and therefore emphasises the need for all pregnant women to have access to skilled care, throughout pregnancy, delivery, postpartum and postnatal periods. The most critical time for both the mother and her baby is during childbirth and in the first few hours afterwards (reproductive health policy draft outline.2005. pg 18).

Objectives

By the end of the section you will be able to:

- Define safe motherhood
- Explain the safe motherhood initiative (SMI)
- Explain the eight pillars of the Safe Motherhood Initiative
- Explain the causes of maternal and perinatal morbidity and mortality
- Explain essential obstetric care

Definition of Safe Motherhood

Safe motherhood is a woman's ability to have a safe and healthy pregnancy and delivery. Making motherhood safe requires action on three fronts simultaneously:

- Reduce the number of high risk and unwanted pregnancies
- Reduce the number of obstetric complications
- Reduce the cases of high fertility rate in women
  with complications

The Key Components of Safe Motherhood

- Focused antenatal care which research suggests lowers the rate of maternal morbidity and mortality
- Safe and clean delivery so that all women deliver under some type of supervised care, where referral systems are established to provide emergency treatment for life threatening complications of delivery
- Postnatal care that contributes to a woman's ability to enjoy sexual relations without pain and have safe pregnancy and delivery in future
- Safe, humane and cost-effective post-abortion care

Safe Motherhood Initiative

The Safe Motherhood Initiative (SMI) is a supportive effort, which was launched in 1987, in Nairobi, by WHO and its partners to focus the world's attention on problems related to pregnancy and childbirth. Lack of commitment to women's health problems by the government was seen as the major underlying cause of many maternal deaths. To address this problem, delegates to the Nairobi Conference in 1987 recommended the introduction of a Safe Motherhood Initiative (SMI) to be implemented by all countries.

Objectives of the Safe Motherhood Initiative

The conference described the Safe Motherhood Initiative as a global strategy aimed at reducing maternal mortality by half by the year 2000 by creating circumstances within which a woman is enabled to:

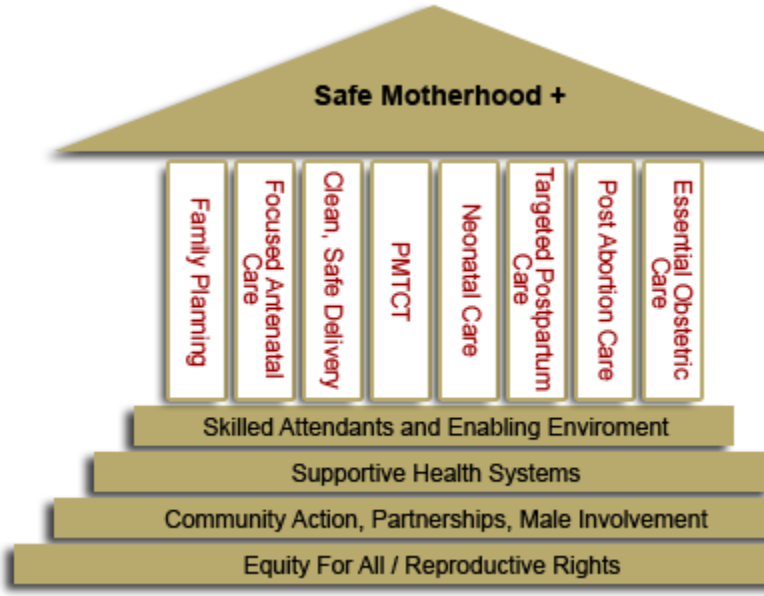
- Choose whether she will become pregnant
- Receive care for the prevention and treatment of pregnancy complications
- Have access to trained birth attendants
- Have access to emergency obstetric complications if necessary
- Have care after birth
- Avoid death or disability from complications of pregnancy and childbirth (Feuerestein, 1993)

In response, the Kenya government endorsed this plan of action to reduce maternal mortality and morbidity. The scope of the Safe Motherhood Initiative has advanced tremendously to encompass many action areas and now includes safe motherhood through human rights for women (Fathalla, 1997 and 2000; WHO 2001).

The SMI differs from other health initiatives in that it focuses on the well being of women as an end to itself. Thaddeus and Maine (1994) argued that, prevention of a death of a pregnant woman is considered to be the key objective, not because the death adversely affects children and other family members but because women are intrinsically valuable.

The Eight Pillars of Safe Motherhood

In order to reduce maternal morbidity and mortality, efforts should be focused on the eight pillars of safe motherhood as illustrated in the diagram below.



Family Planning

Good family planning ensures that individuals and couples have the information and services to plan the timing, number and spacing of

pregnancies. For further reading, see unit four of this module.

Focused Antenatal Care
This serves to prevent complications where possible and ensures that complications of pregnancy are detected early and treated appropriately. Four focused antenatal visits are recommended, which emphasise:

- Taking two doses of sulphapyremethane (SP) during pregnancy for malaria endemic areas
- Recognising signs and symptoms of malaria
- Recognising danger signs in pregnancy and where to go for help
- Drawing up an individual birth plan, which should include a mother/baby package, transport plans and funds/money. For further reading, see unit two of this module

Clean and Safe Delivery
Always ensure that all birth attendants have the knowledge, skills, positive attitude and equipment to perform a clean and safe delivery and provide postpartum care to the mother and baby. For further reading, see unit three.

Essential Obstetric Care
Ensure that essential care for high-risk pregnancies and complications is available to all women who need it. For further reading, see Units Two, Three and Five. In addition, post abortion care and prevention of maternal to child transmission (PMCT) of HIV are also key components of safe motherhood. For further reading, see units five and six of this module.

Post Abortion Care
Abortion is one of the major causes of maternal morbidity and mortality. Health care workers and facilities need to be well equipped to prevent and effectively manage complications that arise from the procedure. The patients psychological well being need to be handled by an experienced health care worker to cover trauma and suicidal tendencies as well its occurrence in future.

Prevention of Mother to Child Transmission of HIV (PMTCT)
The government is in support of preventive measures that would ensure little or no transmission of HIV virus by any means. PMTCT is a programme that was initiated in the maternal child health care services to protect the unborn baby from contracting the virus.

Targeted Postpartum Care
Maternal deaths in many cases happen during the postpartum period. Close follow-up by skilled health care worker would ensure early detection, prevention and treatment of any pregnancy and delivery complications, which may not have been noted during pregnancy and delivery.

Neonatal Care
The neonatal period is very sensitive, surveys have shown that the majority of neonates in this country do not survive. In Kenya more than half of the women deliver at home and hence the need for closer neonatal follow-up and observation as this would lead to early detection and management of complications that may arise at this tender age.

Foundation Measures
These eight strategic interventions must be delivered through primary health care (PHC) and rest on a foundation of greater equity for women. This recognises the fact that the eight pillars of SMI can only prevent immediate causes of maternal death. Underlying causes of maternal death are often as a result of the poor socioeconomic status of women and these issues require other strategies. In strengthening this foundation the Ministry of Health has indicated the need for:

- Skilled attendants and enabling environment to provide quality care
- Supportive health systems: effective systems of referral, management, procurement, training, supervision and health management information systems
- Community action, partnership, and male involvement
- Equity for all/reproductive rights

When strategising, countries were encouraged to design other non-health activities which could improve the socioeconomic status of women such as providing formal education for girls, giving women equal employment and business opportunities as well as the empowerment of women to make decisions within their own households. These concepts are also dealt with in the section on gender and reproductive health rights.
The health sector, through the concept of PHC (collaboration across ministries and sectors) should, therefore, involve other ministries and

organisations in implementing a national and district safe motherhood initiative.

Causes of Maternal and Perinatal Morbidity and Mortality

Maternal death is defined as death occurring to a mother following pregnancy or labour, or as a consequence of pregnancy within 42 days after delivery or abortion. The determinants of maternal morbidity and mortality in Kenya are multiple and closely interwoven.

The global estimate for maternal mortality rate is 600 per 100,000 live births. 99% of these women live in the less developed world. Maternal mortality in Kenya is unacceptably high, estimated at more than 414 (KDHS 2003) per 100,000 live births. This is marked by wide regional variation, with the highest incidence rates in Nyanza, North Eastern and Western province, low rates in Central and parts of Eastern provinces, and the lowest rates in Nairobi Province (NCPD).

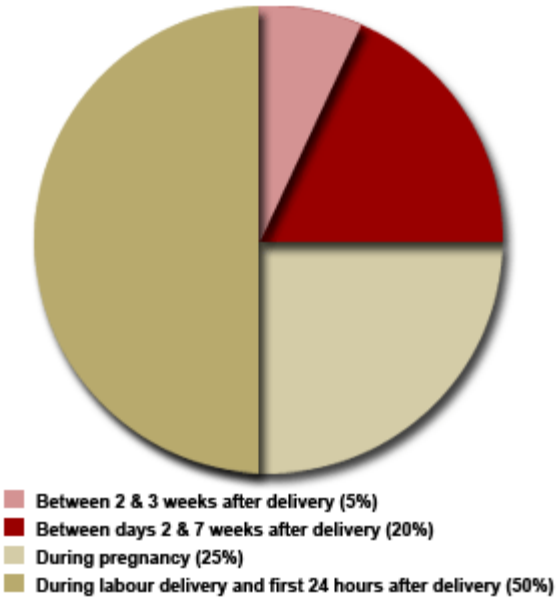
Approximately 90% of these deaths could have been prevented if timely and appropriate quality obstetric care had been provided. It is now recognised that all pregnant women are at risk of obstetric complications, therefore, there needs to be universal provision of, and accessibility to, quality essential obstetric care.

Causes of Maternal and Perinatal Morbidity and Mortality

Causes of Maternal Deaths	%	Proven Intervention
Bleeding after delivery (postpartum haemorrhage)	25	Treat anaemia in pregnancy Skilled attendant at birth Prevent or treat bleeding with correct drugs; replace fluid loss by IV infusions or blood transfusion if severe
Infection after delivery	15	Skilled attendant at birth Clean practices Antibiotics if infection occurs
Unsafe abortion	13	Skilled attendant Antibiotics Empty uterus (MVA) Replace fluid loss if required Counsel and provide family planning
High blood pressure Hypertension during pregnancy: Most dangerous when severe (eclampsia)	12	ANC detection: Refer to medical officer Treat eclampsia with appropriate anti-convulsants Refer unconscious woman for supervised urgent delivery
Obstructed labour	8	Detect in time (use partograph) Refer for appropriate delivery
Other direct causes Ectopic pregnancy	8	Treat shock Refer for operation
Indirect causes of maternal morbidity and mortality including: anaemia, uterine prolapse, pelvic inflammatory disease and infertility, incontinence Lower genital tract injuries such as recto and vesico-vaginal fistulae	19	Early detection and prompt treatment Effective prevention and control measures

For every woman who dies from complications of pregnancy, 30 - 100 more women suffer these acute and chronic complications that are painful and debilitating. The graph (right) shows when maternal deaths are most likely to occur.

Global experience from the first ten years after launching of the SMI, showed that maternal morbidity and mortality due to obstetric complications could be prevented (with existing knowledge and technology).



Methods for Preventing Maternal Morbidity and Mortality Due to Obstetric Complications

- Recognising that every pregnancy faces risks
- Increasing access to family planning services
- Improving the quality of antenatal and postnatal care
- Ensuring access to essential obstetric care (including post abortion care)
- Expanding access to midwifery care in the community
- Training and deploying appropriate and skilled health personnel, for example, midwives
- Ensuring a continuum of care connected by effective referral links and supported by adequate supplies, equipment, drugs and transportation
- Reforming laws and policies to expand women's access to health services and to promote women's health interest

The National Reproductive Health strategy (1999 - 2003) also identified the primary goal for safe motherhood as the reduction of maternal and child morbidity and mortality.

Reproductive Health Targets Set by The Kenya Sessional Paper No. 1.

- Reduction of maternal mortality ratio (per 100,000 live births) from 414 in 2003 to 230 by year 2005 and 170 by year 2010
- Increase in professionally attended deliveries from 44% in 2003 to 90% by year 2010
- Expansion of services and the improvement of quality of care

Nationally, the utilisation of antenatal services is high. The Kenya Demographic Health Survey (KDHS), 1998 states that 92% of mothers surveyed received antenatal care. This trend is also documented in the SMDP Baseline Survey 2000, which showed 93% attendance. However, about one third of women only attend during the last trimester of pregnancy, when it is already too late to receive the optimum benefits of antenatal care.

This trend does not apply to the utilisation of delivery services. Nationally, only 42% of births take place in health facilities, which is marked by regional variation, from 75% in Nairobi to 25% in Western province (KDHS, 1998). The overriding goal of the Implementation Plan of Reproductive Health Strategy (2004 - 2008) is to increase to 40% the percentage of women who have a skilled attendant at birth in the targeted areas.

Essential Obstetric Care

Essential Obstetric Care is the phrase used to describe the elements of obstetric care needed for the management of both normal and complicated pregnancies, and the delivery and post partum period.

The health facility should be able to provide:

- Parenteral antibiotics
- Parenteral anticonvulsants antihypertensives for pregnancy induced hypertension
- Parenteral oxytoxic drugs
- Manual removal of the placenta
- Removal of retained products of conception or Manual Vacuum Aspiration (MVA)
- Perform assisted vaginal delivery, for example, ventouse or vacuum extraction)

All women should have access to a skilled attendant during pregnancy, childbirth and the postpartum period. The attendant should be able to provide basic essential obstetric care and refer women for comprehensive essential obstetric care in case of complications.

As stated previously the overall goal for the next five-year Implementation Plan for Reproductive Health Strategy (2004 - 2008) is to increase to 40% the percentage of women who have skilled

attendant at birth in the targeted areas. Specific objectives of the Plan include:

- To increase to 80% the percentage of basic health facilities at least in two provinces, providing quality essential obstetric care, (including PMTCT plus BFHI)
- To increase to 100% the percentage of hospitals providing comprehensive emergency obstetric care
- To strengthen the referral systems in 50% of health facilities
- To ensure that 50% of mothers are provided with information on obstetric care, reproductive health and family planning
- To set up adolescent friendly services in 50% of facilities in target areas

The 2004 - 2008 strategy renews the emphasis to strengthen the capacity of the health system to provide good quality care during pregnancy, delivery and the post partum period and on mobilising the community to increase utilisation of these services.

The Implementation Plan for Reproductive Health Strategy (2004 - 2008) will be achieved through the following strategies:

Advocacy for Essential Obstetric Care Activities

- An increase in the budgetary allocation for safe motherhood activities
- Reproductive health policy changes to support essential obstetric care services at primary facilities, especially in remote areas
- Integration of PMTCT, including BFHI activities in the implementation of safe motherhood initiatives

Remember: As a health care provider, you have an important role, of not only providing safe motherhood activities, but also that of advocacy for essential obstetric care.

Capacity Building for Health Workers

This will focus on forming a core of team trainers from District Health Management Teams (DHMT) who will then be responsible for training and providing support supervision for the health workers in their districts.

Strengthening Service Delivery

Health facility assessments will be done to access all levels of staff for training and equipment needs of the facilities. Equipment and supplies will be procured for the health facilities to enable them carry out EOC activities. In addition, government hospitals in the targeted areas will be upgraded to provide comprehensive obstetric care. Support through transport and communication equipment will be provided for referral services. In the hard to reach areas an effort will be made to improve the water supply to the health facilities and surrounding community.

Community Mobilisation and Empowerment

It is important for the communities to support and have ownership of the safe motherhood activities in their region and to increase the utilisation of these services. The health management boards and committees will be oriented on their roles and responsibilities to assist them provide greater support for safe motherhood initiatives.

Mothers should be educated on the recognition of risky conditions in pregnancy and when to seek care. Women's participation in health issues will be encouraged. Communities will also be sensitised on the available services, with emphasis on preventive and proactive measures and simple approaches to the management of common ailments for improving home based practices relating to safe motherhood, prevention of HIV/AIDS and malaria, and improvement of health in general.

The renewed emphasis within the Health Policy Framework on proactive and preventive services also has a number of implications for safe motherhood. The contribution to reducing maternal mortality and morbidity of such services lies primarily in the:

- Prevention of unwanted pregnancies
- Promotion of messages on danger signs in pregnancy and labour
- Promotion of the woman's overall health status and well being
- Promotion of clean/safe delivery

The Government of Kenya's decentralisation to district level of the responsibility for the day to day running of the health care system is consistent with the major thrust of safe motherhood programming. The district is regarded as the basic unit for the planning, implementation and provision of services to prevent maternal mortality and morbidity.

UNIT TWO PART ONE: PREGNANCY

In this unit you will cover the anatomy and physiology of the female reproductive system and physiological changes that occur during pregnancy.
Once you have completed this unit, you will be able to manage a pregnant woman in a holistic manner.
This unit is composed of two sections:
Section One: Anatomy and Physiology of the Female Reproductive System
Section Two: Physiology of Pregnancy

Unit Objectives

By the end of this unit you will be able to:

- Describe the anatomy and physiology of the female reproductive system
- Explain the physiological changes that occur
  during pregnanc

SECTION 1: ANATOMY AND PHYSIOLOGY OF THE FEMALE REPRODUCTIVE SYSTEM

Introduction

As you learnt in the introduction to reproductive health unit, the Safe Motherhood Initiative (SMI) is designed to reduce the high numbers of deaths (maternal mortality) and illnesses (maternal morbidity) resulting from complications of pregnancy and childbirth. It is, therefore, important to study and understand the whole process of reproduction, that is, the anatomy and physiology of the human reproductive system.
A lot of the information you will find in this unit is not new to you as you studied it during your previous nursing training. However, it is important to go through everything once again as you will build on this knowledge in the subsequent sections of this unit.

Objectives

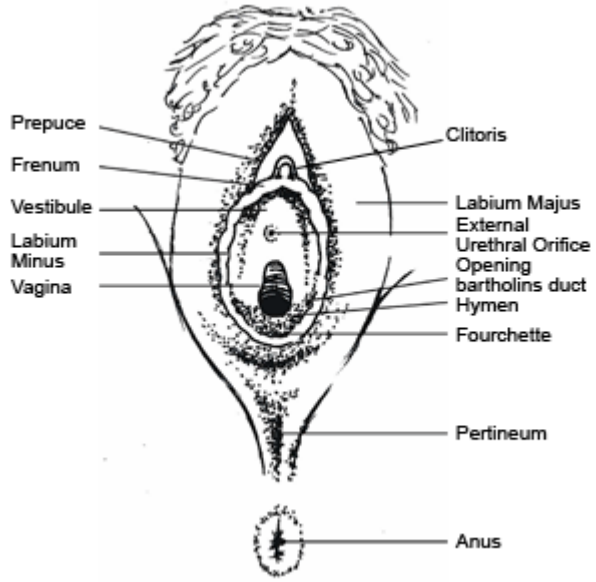
By the end of this section you will be able to:

- Describe the components of the female reproductive system
- Describe the functions of the hormones that regulate the menstrual cycle and pregnancy
- Describe obstetric anatomy
- Outline the anatomy of the foetal skull

The Components of the Female Reproductive System

The female reproductive system consists of two parts: the external genitalia and the internal genitalia. You will study each part separately starting with the external genitalia.

The External Genitalia (Vulva)
The external genitalia is also known as the vulva. It is made up of all the external organs as shown in the illustration opposite. It extends from the mons veneris anteriorly, to the perineal body posteriorly.



The External Genitalia (Vulva)
The following are parts of the external genitalia

The Mons Veneris
This is a pad of fat lying over the body of the pubic bone and is covered by skin on which hair grows from the time of puberty.

The Labia Majora
These are two thick folds of fatty and areola tissue covered by skin externally. They start in

the Mons Veneris and merge into the Perineum posteriorly.

The Labia Minora
The labia minor are two small thin folds of skin lying between, and almost covered by the labia majora. They fuse posteriorly thus forming the fourchette.

The Clitoris
This is a highly sensitive erectile structure situated at the anterior junction of the Labia minora. It is the female equivalent of the male penis.

The Urethral Meatus
This is a small opening about 2.5 centimetres below
the clitoris.

The Vaginal Orifice
This is also known as the introitus of the vagina. It lies between the labia minora and posteriorly to the urethra. It is partially occluded by the hymen in girls who have not been sexually active.

The Hymen
This is a thin membrane which partially shuts the introitus in the vagina.

The Bartholin's Glands
These are two small glands, one on either side of, and slightly posterior to the vagina, beneath the labia majora. Their ducts open into the vaginal orifice. They secrete mucus, which lubricates the vaginal orifice.
The vulva receives its blood supply from the internal and external pudendal arteries and which is then returned through the pudendal veins. The lymphatic drainage is via the inguinal glands, while the nerve supply is derived from the pudendal nerve
These parts make up the external genitalia. Now move on to look at the internal genitalia.

The Internal Genitalia
The internal genitalia comprises of:

- The vagina
- The uterus
- The uterine tubes (also called the fallopian tubes)
- The ovaries

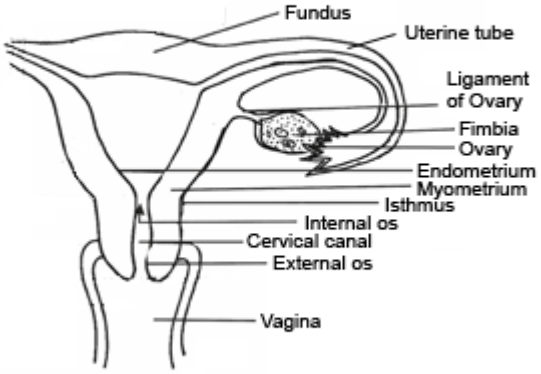
These will now be covered separately.

The Vagina

The vagina is a fibro-muscular canal joining the external genitalia and the uterus. The posterior wall of the vagina is longer than the anterior wall. This is because the cervix projects at right angle into the upper part of the anterior wall. Its walls are arranged in folds known as rugae, which allow the vagina to stretch during sexual intercourse and childbirth.
The vault is the upper end of the vagina, which forms four arches known as fornices. The posterior fornix is the largest.
The vagina has four layers, these are:

- The inner layer or lining made of squamous epithelium
- The vascular connective tissue beneath it
- The muscle layer that is divided into a weak inner fibre and a stronger outer coat of longitudinal fibres
- A layer of connective tissue, which surrounds the vagina

Blood Supply - The blood supply comes from branches of the internal iliac artery, the vaginal artery and a branch of the uterine artery. The blood drains through the vaginal vein and a branch of the uterine artery. Lymphatic drainage is via the inguinal, the internal iliac and the sacral glands. Nerve supply is via the Lee Frankenhauser plexus.
In front of the vagina lies the bladder and the urethra, which are closely connected to the anterior wall. Behind the vagina are the pouch of Douglas, the rectum and the perineal body. Each of these occupies about one third of the posterior vaginal wall. The uterus lies above the vagina.



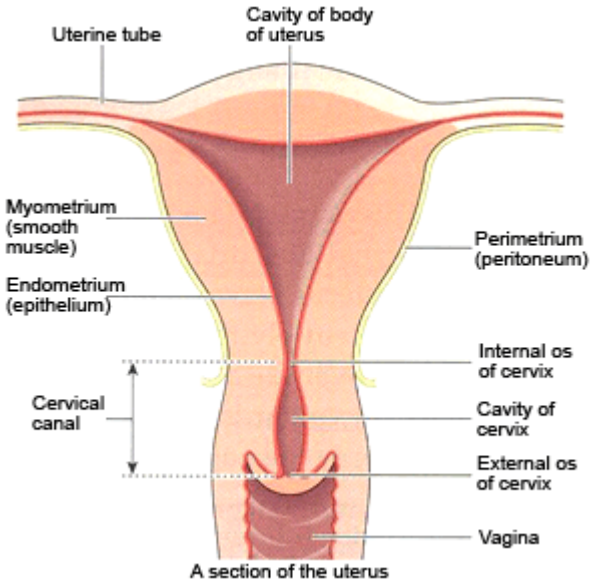
The Uterus

The non-pregnant uterus is a hollow pear-shaped muscular organ situated in the pelvic cavity. It is 7.5 centimetres long, 5 centimetres wide,
2.5 centimetres deep and 1.25 centimetres thick. It lies behind the bladder and in front of the rectum. It leans forward over the bladder, which is known as anteversion and bends forward the cervix at the level of the internal os, which is known as anteflexion. When a woman stands, the position becomes almost horizontal with the fundus, resting on the bladder.

The uterus performs the following functions among others:

- Receives the fertilised ovum
- Provides shelter for the foetus during pregnancy
- Expels the uterine contents during childbirth

Anterior to the uterus lie the utero-vesical pouch and the bladder, while posteriorly lie the recto-uterine pouch of Douglas and the rectum. Laterally, on either side, are the broad ligaments, the uterine tubes and the ovaries.



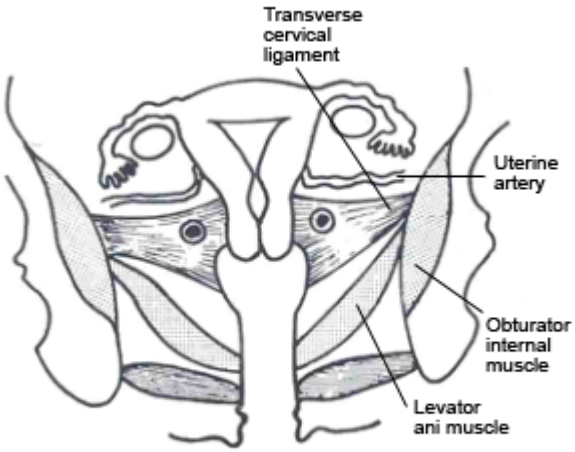
A section of the uterus

The uterus is kept in its normal position in the pelvis by the following supports:

- Ligaments
- The muscles of the pelvic floor which is mainly the levator ani
- The pubovesico-cervical support consisting mainly of fascia

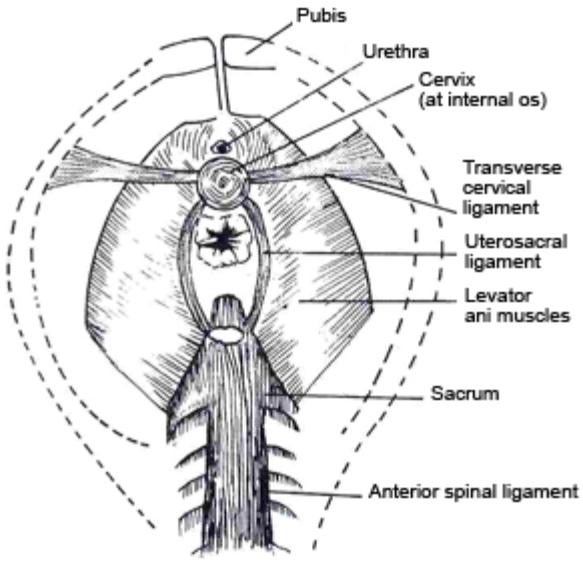
The ligaments are the most important support structures and help to maintain the uterus in its position. They consist of the following:

- The transverse cervical ligaments
- The uterosacral ligaments
- The pubocervical ligaments
- The broad ligaments
- The round ligaments
- The ovarian ligaments



The transverse cervical (also called cardinal ligaments) are the most important uterine support. They fan out from the sides of the cervix to the sidewalls of the pelvis to give lateral stability to the cervix. The utero-sacral ligaments pass backwards from the cervix to the sacrum. They maintain the body of the uterus in anteversion position.

The round ligaments arise at the cornua of the uterus and descend through the broad ligaments and inguinal canal to the labia majora. They hold the fundus forward in anteversion, especially when forces such as distension of the bladder tend to push the uterus back. The broad ligaments are folds of peritoneum over the fallopian tubes and do not support the uterus.



Structure of the Non-Pregnant Uterus
The uterus of a non-pregnant woman is a hollow pear shaped muscular organ that consists of the following parts:

- The body makes up the upper two-thirds of the uterus and is the biggest part.
- The fundus is the upper rounded part above the insertion of the fallopian tubes.
- The cornua are the upper outer angles where the uterine tubes join.
- The uterine cavity is the triangular space between the anterior and posterior walls, with the base of the triangle uppermost.
- The isthmus is the narrow area between the cavity and the cervix.
- The cervix protrudes into the vagina with the upper half above the vagina.
- The internal os is a narrow opening between the isthmus and the cervix, the external os is a small round opening at the lower end of the cervix.

The Layers of the Uterus
The uterus has three layers: the endometrium, the myometrium and the perimetrium.

The Endometrium
This is the inner lining of the uterus composed of ciliated epithelium (mucous membrane) on a connective tissue base and it changes in thickness during the menstrual cycle. The basal layer does not change. This will be discussed further under the menstrual cycle.

The Myometrium (or Muscle Coat)
This is the middle layer of the uterus. It is the thickest layer and is made up of three layers of muscle fibre. The fibres run in all directions and intermingle to surround the blood vessels and lymphatics.

The Perimetrium
This is a double serous membrane and extension of the peritoneum, which is draped over the uterus and uterine tubes.

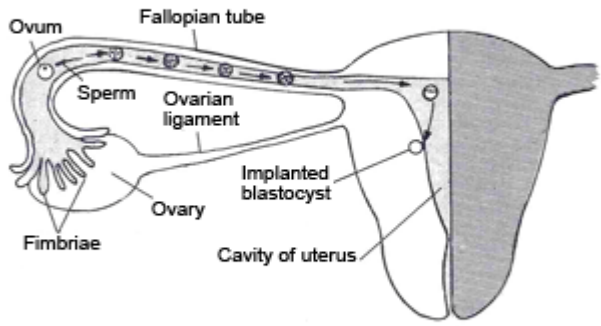
The Uterine Tubes (Fallopian Tubes)
The fallopian tubes are passages that link the ovaries to the uterus. Each tube is between 10 - 12 centimetres long and is divided into four main parts, namely:

- The interstitial portion, which is the medial part that opens into the uterus. Its whole length lies within the walls of the uterus. It is the shortest and narrowest part of the tube with a length of 1.25 centimetres and its lumen is 1 millimetre wide.
- The isthmus, which is the narrow portion immediately adjoining the uterus.
- The ampulla, which is the widest and longest (5 centimetres long) part of the fallopian tube and it is here that fertilisation occurs.
- The infundibulum, which is the fimbriated end of the fallopian tube. It is in close proximity to the ovary and its finger-like projections are known as fimbriae. One of the fimbriae, being longer than the others, is in contact with the ovary and picks up the ovum from the surface of the ovary at ovulation.

The uterine tube has three coats or layers. These are the serous, the muscular, and the mucous layers. The inner epithelium is lined with a mucous membrane of ciliated cubical epithelium, which is arranged in folds. These folds slow the ovum down on its way to the uterus. In the lining are cells that produce a secretion containing glycogen to nourish the ovum. Beneath the lining is a layer of vascular connective tissue.
The middle layer of thin muscle coat consists of two layers, a longitudinal outer layer and a circular inner layer, both of smooth muscle. The tube is covered with peritoneum.
The blood supply comes from the uterine and ovarian arteries and returns through the corresponding veins. The lymphatic drainage is

carried out through the lumbar glands and the nerve supply is from the ovarian plexus.

The Ovaries
These are two glandular structures lying on the posterior surface of the broad ligament, supported by the ovarian and the infundibulo-pelvic ligaments. They are oval shaped and are composed of a medulla and a cortex, which is covered with germinal epithelium.
The medulla is made up of fibrous tissue, throughout which the ovarian blood vessels and the lymphatics and nerves travel. The cortex is the functional part of the ovary. It contains the Graafian follicles that are in different stages of development, surrounded by the stroma.
From puberty some of the Graafian follicles enlarge under the influence of the follicle-stimulating hormone. One Graafian follicle matures each month and ruptures to release an ovum. The ovaries produce ova and the hormones oestrogen and progesterone.



Blood supply to the ovaries is provided by the ovarian arteries and drained by the ovarian veins. The lumbar glands maintain lymphatic drainage while nerve supply is from the ovarian plexus.

So far, you have learned about the different structures that make up the female reproductive system. You now know that the vagina acts as a receptacle of the semen during sexual intercourse, as a passage for menstrual blood and for the foetus during delivery. It was also mentioned that the uterus is the site where the foetus grows from implantation to maturity, the fallopian tubes are passages through which the ova passes to be propelled to the uterine cavity, and that the functions of the ovaries include production of ova and hormones.
You have now completed the external and internal genitalia of the female reproductive system.

Hormones

From puberty to menopause, the female reproductive system goes through regular cycles, governed by various hormones. You will now look at these hormones and what they do.
The most important hormones in relation to reproduction in the female are:

- The Follicle-Stimulating Hormone (FSH)
- The Luteinizing Hormone (LH)
- Oestrogen
- Progesterone

What are the functions of FSH and LH?
The hypothalamus controls and governs the anterior pituitary gland. The hypothalamus produces Gonadotrophin-Releasing Hormone (GnRH) which acts on the anterior pituitary gland to secrete two gonadotrophins: the Follicle-Stimulating Hormone (FSH) and Luteinizing Hormone (LH).

Follicle-Stimulating Hormone (FSH)
The FSH causes the Graafian follicle in the ovarian cortex to develop, mature and rupture to release the ovum into the fimbriated end of the fallopian tube. This is known as ovulation.

Luteinizing Hormone (LH)
It influences development of the corpus luteum to produce oestrogen and progesterone. LH is produced for only fourteen days after which the FSH reappears.

Ovarian Hormones
As mentioned while discussing the structure of the ovaries, the ovaries produce two hormones: oestrogen and progesterone.

Oestrogen
This is produced under the influence of FSH. It is produced by three different parts, which are:

- The granulosa and theca cells of the Graafian follicle during the first 14 days of the twenty eight day cycle.
- The corpus luteum and the adrenal cortex in small quantities after ovulation.

- The placenta during pregnancy.

Oestrogen is comprised of oestriol, oestriadiol and oestrone compounds.
The following are some of the effects of oestrogen:

- Oestrogen stimulates the growth of the secondary sex characteristics.
- It causes proliferation of the uterine endometrium during the menstrual cycle.
- During pregnancy it promotes growth of the uterine muscles.
- It promotes proliferation of the uterine endometrium.
- It suppresses ovulation.
- It inhibits lactation.
- It assists water and electrolyte retention in the body.

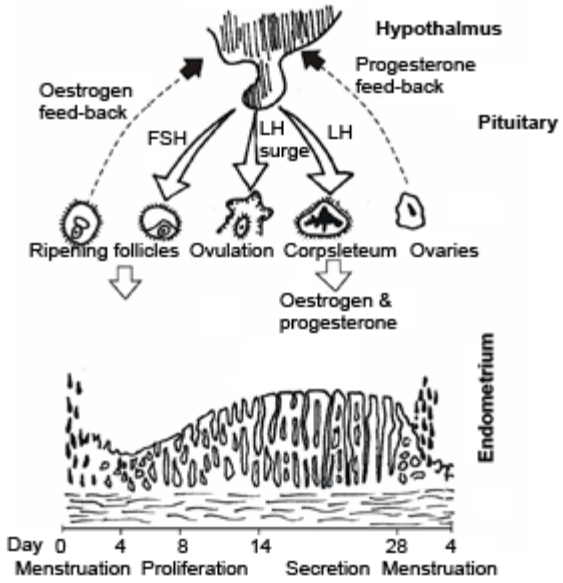
Progesterone
Progesterone is produced by the corpus luteum under the influence of the Lutenizing Hormone (LH) and by the placenta during pregnancy.
Progesterone only acts on tissues, which have previously been acted on by oestrogens, and its effect is mainly evident during the second phase of the menstrual cycle when it causes the endometrium to increase in size. It also increases secretions and blood supply in readiness for possible arrival of a fertilised ovum.

The Menstrual Cycle
The average menstrual cycle is taken to be 28 days, although it may vary in length from 22 to 35 days. The hormones you have just looked at control the menstrual cycle. A normal menstrual cycle is divided into three phases, which will now be covered individually.

Phase 1: The Menstrual Phase
This is the phase during which vaginal bleeding occurs. It lasts three to five days. The endometrium is shed down to the basal layer and discharged together with blood from the capillaries and the unfertilised ovum.

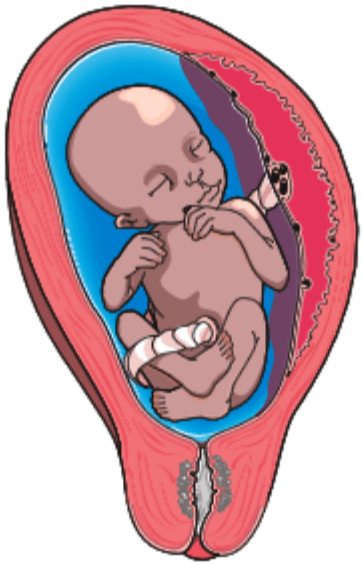
Phase 2: The Proliferative/Follicular Phase
This phase follows the menstrual phase and lasts until ovulation, approximately 14 days from the first day of menstruation in a 28-day cycle. It is the phase of regrowth and thickening under the influence of oestrogen.

Phase 3: The Secretory/Luteal Phase
This phase follows immediately after ovulation under the influence of progesterone and oestrogen from the corpus luteum. The endometrium thickens and becomes spongy, and there is an increase in secretions from the endometrial glands. If the fertilisation does not occur, the ovum dies and degenerates 36 to 48 hours after its release. The corpus luteum also degenerates about 10 days later. Menstruation then takes place 14 days after ovulation. If, on the other hand, fertilisation occurs, the corpus luteum continues to grow and produces hormones that support the pregnancy. The fertilised ovum gets implanted on the endometrium.
The illustration below shows the phases of the menstrual cycle.



Obstetric Anatomy

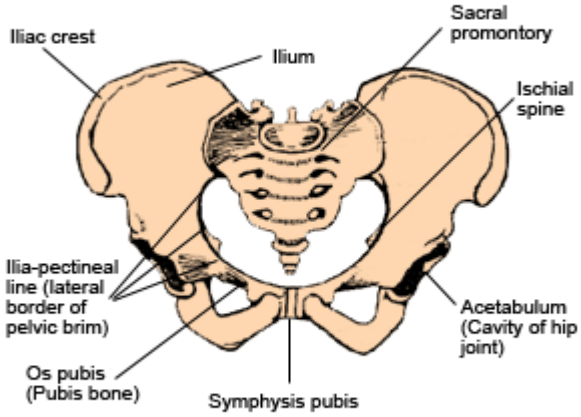
In a normal vaginal delivery, the foetus must pass through the bony canal formed by the pelvic bones. The foetal skull is the most rigid structure that has to pass through this canal. You should therefore know the limits of a normal female pelvis so that you can detect deviations from the normal. By so doing, you will be able to identify women at risk and refer them to a hospital, where a caesarean section can be performed.
While learning obstetric anatomy, you will also look at parts of the female pelvis and the foetal skull.



The Bony Pelvis

The shape of a normal female pelvis is cylindrical and has a slight anterior curve near the outlet. The curve results from the fact that the posterior body of the pelvis sacrum and coccyx is longer than the anterior border which is the symphysis pubis.

In order for the foetal head to pass through the maternal pelvis, the diameter of the pelvis at the inlet, outlet and mid-cavity levels must be adequate.



As you can see from the illustration, the bony female pelvis is a basin-like structure with a hole at the bottom through which the baby passes. It is made up of four bones, namely: two innominate bones, one sacrum and one coccyx

The Innominate Bones

These form the sides of the basin. They are joined together at the front by the symphysis pubis and are separated at the back by the sacrum. Each innominate bone is composed of three parts: the ilium the ischium and the pubic bone.

The Three Parts of the Innominate Bones

The Ilium

The ilium is large and flares out. The upper border is called the iliac crest. The anterior superior iliac spine is a bony prominence that is at the front of the iliac crest, and below it is the anterior inferior iliac spine. At the end of the iliac crest are the posterior-superior and posterior-inferior iliac spines. The iliac fossa is the concave anterior surface of the ilium.

The Ischium

This is the thick lower part of the innominate bone. When sitting, the body rests on its large prominence, that is, the ischial tuberosity. The ischial spine lies behind the ischial tuberosity.

The Pubic Bones

These form the anterior part of the innominate bone. They have a body and two projections: the superior ramus and the inferior ramus. The two pubic bones meet at the symphysis pubis and the two inferior rami form the pubic arch.

The Sacrum

The sacrum is a wedge shaped bone consisting of five fused vertebrae. The upper border of the first sacral vertebra juts forward and is known as the sacral promontory. The anterior surface of the sacrum is concave and is known as the hollow of the sacrum.

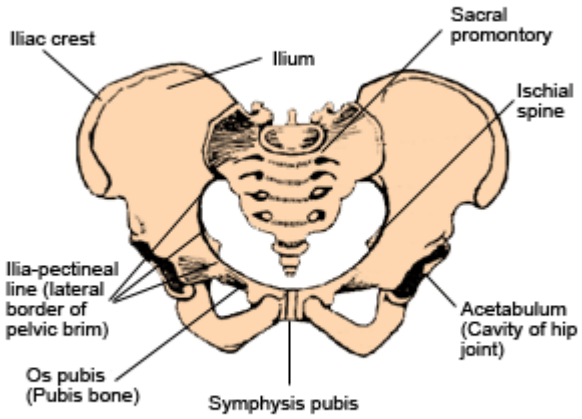
The Coccyx

The coccyx is the tailbone. It consists of four fused vertebrae and is the lowest part of the vertebral column. It has no significance in applied obstetric anatomy as it moves out of the way during delivery.

Pelvic Joints

There are four pelvic joints, namely:

- The symphysis pubis which is formed at the junction of the two pelvic bones, which are united by a pad of cartilage.
- Two sacroiliac joints which join the sacrum to the ilium and so connect the spine to the pelvis.
- The sacrococcygeal joint that is formed where the base of the coccyx articulates with the tip of the sacrum.



When there is no pregnancy, there is very little movement in these joints. However, during pregnancy due to endocrine activity the ligaments soften, allowing the joints to give. This allows for more room for the foetal head as it passes through the pelvis. The sacroiliac joints allow a limited backward and forward movement of the tip of the promontory of the sacrum.
The sacrococcygeal joint allows the coccyx to be deflected backward during the birth of the head.

The Pelvic Ligaments
Ligaments hold each pelvic joint together. These are:

- Interpubic ligament at the symphysis pubis
- Sacroilliac ligaments
- Sacroccygeal ligaments

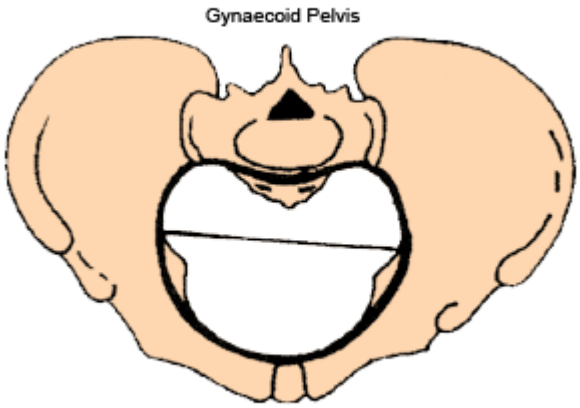
There are two more ligaments that are also important in midwifery, namely:

- The sacrotuberous ligament, which runs from the sacrum to the ischial tuberosity.
- The sacrospinous ligament, which runs from the sacrum to the ischial spine.

Types of Pelvis
The pelvis has been classified into four types, according to the shape of the pelvic brim. However, many individuals have a combination of more than one type. The four types are:
The Gynaecoid Pelvis
Also referred to as the true female pelvis, the gynaecoid pelvis has the following features:

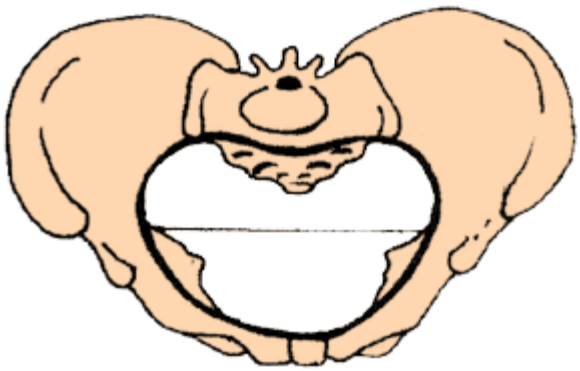
- A rounded brim
- A generous fore-pelvis
- Straight side walls
- A shallow cavity with a broad, well curved sacrum
- Blunt ischial spines
- A wide sciatic notch and pubic arch of 90°

The gynaecoid pelvis is found in women of average build and height with a shoe size of four or larger. It is the ideal pelvis for child bearing.



The Android Pelvis
The android pelvis is also known as the male pelvis. Its brim is heart-shaped with a narrow fore-pelvis. The pelvic cavity is funnel-shaped. The ischial spines are prominent and the pubic arch is less than 90°. It is mostly found in short and heavily built women. It predisposes to an occipital posterior position of the foetal head. It is the least suited to childbearing.

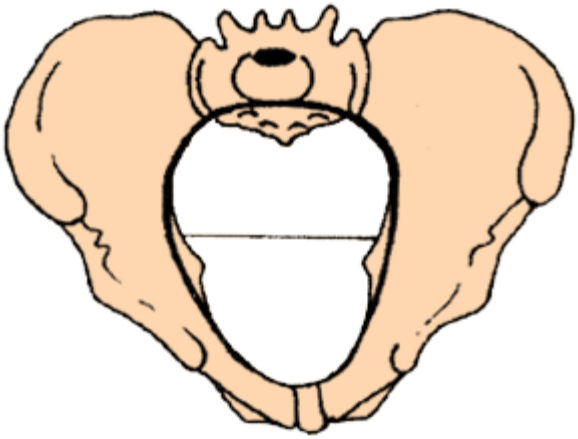
Android Pelvis



The Anthropoid Pelvis

The anthropoid pelvis has a long oval brim, in which the anteroposterior diameter is longer than the transverse. The sides diverge and the sacrum is long and deeply concave. The ischial spines are not prominent and the sciatic notch is very wide and so is the sub-pubic angle. It tends to be found in tall women with narrow shoulders. Labour usually does not present any difficulties, but a direct occipito-anterior or occipito-posterior position is often a feature.

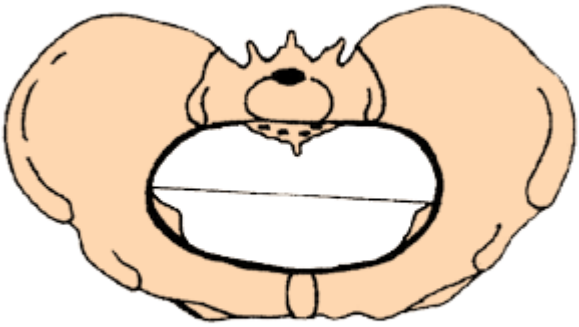
Anthropoid Pelvis



The Platypelloid Pelvis

As illustrated below, the Platypelloid pelvis is a flat pelvis, with a kidney shaped brim. The antero-posterior diameter is reduced while the transverse is increased. The sidewalls diverge, the sacrum is flat, and the cavity is shallow.
The ischial spines are blunt. The sciatic notch and sub-pubic angle are both wide. The foetal head usually descends through the cavity without difficulty.

Platypelloid Pelvis



The features of the different types of female pelvis are summarised in the table below.

Features	Gynaecoid	Android	Anthropoid	Platypelloid
Brim	rounded	heart-shaped	long oval	kidney-shaped
Fore pelvis	generous	narrow	narrowed	wide
Side walls	straight	convergent	divergent	divergent
Ischial spines	blunt	prominent	blunt	blunt
Sciatic notch	rounded	narrow	wide	wide
Sub-pubic angle	90 degrees	<90 degrees	>90 degrees	>90 degrees
Incidence	50%	20%	25%	5%

The True Pelvis

The true pelvis is the body canal through which the foetus must pass during birth. It has a brim, a cavity and an outlet.

The Pelvic Brim

The pelvic brim, which is also known as the inlet, is surrounded anteriorly by the symphysis pubis, laterally by the iliac bones and to the posterior by the sacral promontory. The sacral promontory projects into the brim. This tends to make the anteroposterior diameter less than the transverse diameter, thus forcing the oval head of the foetus to engage the brim in the more accommodating transverse diameter.

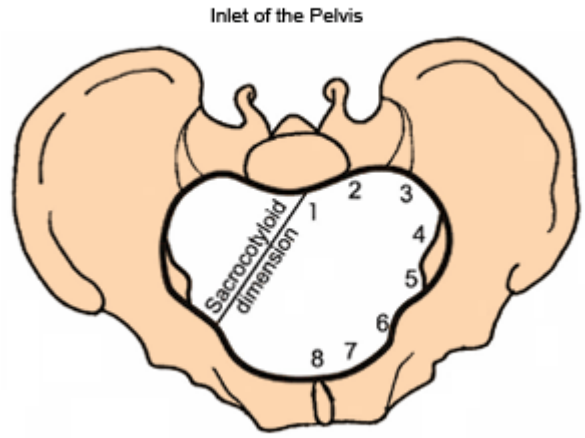
As a reproductive health nurse, you need to be familiar with the fixed points on the pelvic brim, which are known as its landmarks.

Move on to learn more about these landmarks.

As illustrated opposite the landmarks commencing posteriorly are:

- Sacral promontory (1)
- Sacral ala or wing (2)
- Sacroiliac joint (3)
- Iliopectineal line (4)
- Ilepectineal eminence - rough area where the superior ramus of the pubic bone meets the ilium (5)
- Superior ramus of the pelvic bone (6)
- Upper inner border of the body of the pelvic bone (7)
- Upper inner border of the symphysis pubis (8)

Now move on to look at the diameters of the brim in more detail.

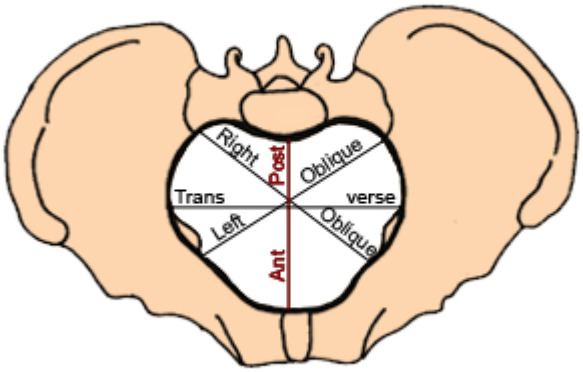


The Anteroposterior Diameter

This is measured from the upper border of the symphysis pubis to the sacral promontry. When measured to the uppermost point of the pubis, it is called the anatomical conjugate and measures 12 centimetres. When taken to the posterior border of the upper surface, which is about 1.25 centimetres lower, it is called the obstetrical conjugate and measures 11 centimetres.

The obstetrical conjugate represents the available space for the passage of the foetus. Both these diameters are sometimes referred to as the true conjugate.

Diameters of the pelvic brim



The Diagonal Conjugate

This is measured from the lower border of the symphysis pubis to the sacral promontory. It measures 12 to 13 centimetres. It can be estimated per vaginum when conducting pelvic assessment.

The Oblique Diameter

This is measured from one sacro-iliac joint to the iliopectineal eminence on the opposite side of the pelvis.

It measures 12 centimetres. There are two oblique diameters, that is the, left oblique and right oblique.

Transverse Diameter

This is the line between the furthest points on the iliopectineal lines. It measures 13 centimetres. Another dimension is the sacrocotyloid which is between the sacral promontory and the iliopectineal eminence on each side.

It measures 9 to 9.5 centimetres. It is important because in posterior position of the occiput, the

parietal eminencies of the foetal head may become caught there.

The Pelvic Cavity

The pelvic cavity, which is also known as the mid-cavity, is a forward curving canal that is bounded above by the plane of the pelvic brim, laterally by ischial spines, posteriorly by the forward curving sacrum and anteriorly by the ascending ramus of the ischium.

The anterior wall is only about 4 centimetres and the posterior wall is approximately 12 centimetres. The transverse diameter, which is 12.5 centimetres, is slightly narrower than the antero-posterior diameter, which is 13.5 centimetres. The oval head of the foetus therefore has to turn through 90° so that its long axis fits in this more accommodating antero-posterior diameter.

The Pelvic Outlet

The posterior outlet is bounded anteriorly by the pubic arch, laterally by the ischial tuberosities, posteriorly by the tip of the sacrum or coccyx and the ligament joining the ischial tuberosities to the sacrum, which are known as sacrotuberous ligaments.

There are two outlets that are described as:

- The anatomical outlet, which is formed by the lower borders of each of the bones and the sacrotuberous ligaments.
- The obstetrical outlet, which is of greater significance because it includes the narrow pelvic strait through which the foetus must pass. It is the space between the narrow pelvic strait and the anatomical outlet. The outlet is diamond-shaped and has three diameters.

Now move on to look at the three diameters of the obstetrical outlet.

The **anteroposterior diameter** is from the lower border of the symphsis pubis to the sacro-coccygeal joints and is 13 centimetres. It indicates the space available during delivery.

The **oblique diameter** lies between the obturator foramen and the sacrospinous ligament but there are no fixed points. It is 12 centimetres.

The **transverse diameter** lies between the two ischial spines and measures 10 to 11 centimetres.

Pelvic Assessment

It is very important for you to understand how to assess the landmarks and measurements of the female pelvis. This is because it will help you to anticipate complications that may occur during delivery so that you can take the appropriate action to save the mother and child.

The adequacy of the pelvis can be judged clinically through a vaginal examination. Three diameters are measured:

Anteroposterior Diameter

During a vaginal examination, you can estimate the Antero-Posterior diameter (AP) of the pelvic inlet by palpating for the sacral promontory with the examining finger. Then you note where the lower margin of the symphysis pubis touches that finger. This gives the diagonal conjugate.

The true conjugate is the line from the sacral promontory to the upper border of the symphysis pubis. The true conjugate is derived by subtracting 1.5 from the diagonal conjugate.

The Oblique Diameter

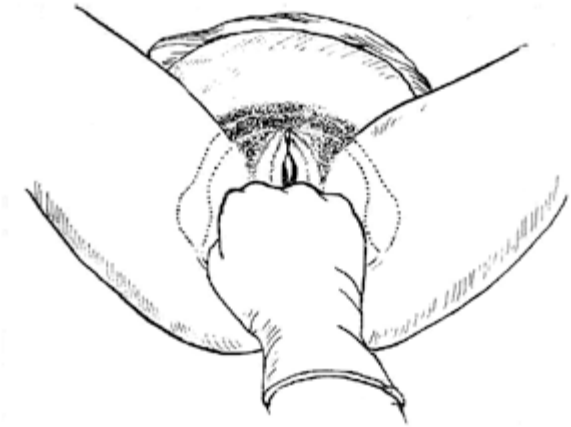
This is the line from one sacroiliac joint to the iliopectineal eminence on the opposite side of the pelvis. It measures 12 centimetres. There are two oblique diameters, the left oblique and right oblique.

Transverse Diameter

The transverse diameter of the pelvic outlet is measured by placing a clenched fist between the two ischial tuberosities (see illustration below). A measurement of 8 centimetres or more suggests an adequate diameter, which is at least about four knuckles.

Another dimension is the sacrocotyloid dimension. It passes from the sacral promontory to the iliopectineal eminence on each side and measures 9 to 9.5 centimetres. It is important because in posterior position of the occiput, the parietal eminencies of the foetal head may be caught there.

Assessing the pelvis outlet



The Pelvic Floor

The pelvic floor is formed by two muscle layers and layers of pelvic fascia. The most important of these is the strong diaphragm of muscles slung like a hammock from the walls of the pelvis. This pelvic diaphragm is made up of muscles and fascia, which unite in the midline. The muscles are:

- Levator ani, which are flat muscles that form a sling which supports the pelvic organs
- Coccygeus, which are triangular sheets of muscle and tendinous fibres situated behind the levator ani

The pelvic floor supports the weight of the abdominal and pelvic organs. Its muscles are responsible for the voluntary control of micturition and defecation. They also play an important part in sexual intercourse. During childbirth, the pelvic floor influences the passive movement of the foetus through the birth canal and relaxes to allow its exit from the pelvis. In prolonged labour, it is strained and overstretched. This may lead to genital prolapse later.

Every pregnant woman needs to have an assessment of the pelvic capacity to determine pelvic adequacy for the passage of the child she is carrying.

It is important for you to understand the obstetric anatomy of the female pelvis. You will need this knowledge in order to understand and appreciate the mechanisms of labour, which will be covered later in unit three.

The Foetal Skull

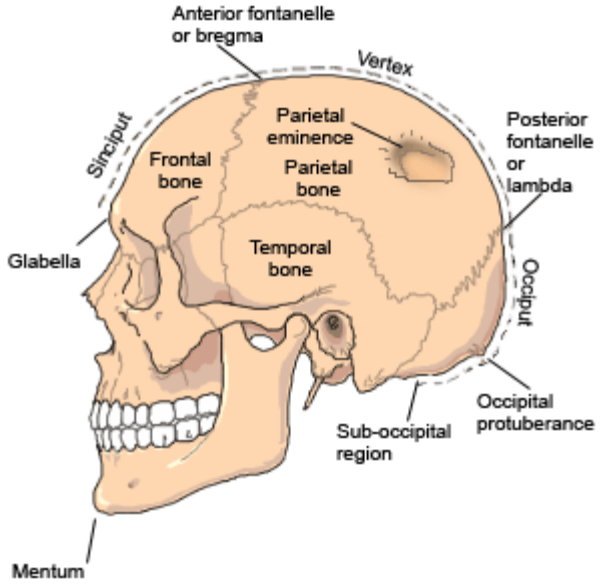
The foetal skull contains a delicate brain, which may be subjected to great pressures as the head passes through the birth canal. You need to understand the landmarks and measurements of the foetal skull, so that you are able to recognise normal presentation and positions, and thus facilitate delivery with the least possible trauma to mother and child.

The landmarks of the skull are described as:

- The vault, which lies between the orbital ridges and the nape of the neck. Here the bones are thin and pliable so as to allow for alterations of the skull at birth. It is composed of the occipital bone, two parietal bones and two frontal bones.
- The base, which is comprised of firmly united bones that protect the vital centres in the medulla.
- The face, which is composed of 14 small bones that are firmly united and cannot be compressed.
- The mentun, which is also called the chin.

The regions of the skull are:

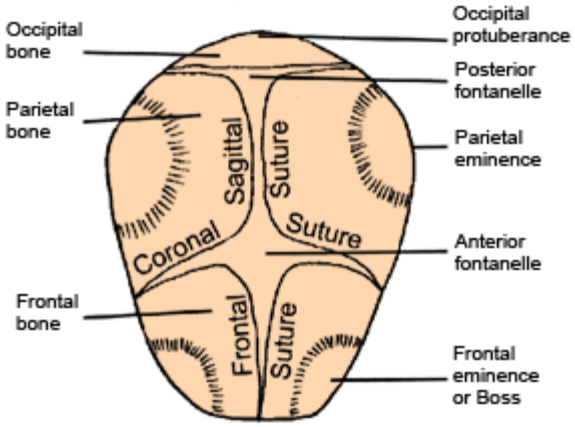
- The occiput, which lies between the foramen magnum and the posterior fontanelle. The sub-occipital region is the part below the occipital protuberance.
- The vertex, which is bounded by the posterior fontanelle, the two parietal eminences and the anterior fontanelle.
- The sinciput or brow, which occurs from the anterior fontanelle and the coronal suture to the orbital ridge.



The Foetal Skull - The Sutures

Sutures and fontanelles separate the bones of the skull from each other. These allow for a degree of overlapping during labour and delivery. They are cranial points that are formed where two bones adjoin. They include:

- The lambdoidal suture, which separates the occipital bone from the two parietal bones.
  The sagittal suture, which lies between the parietal bones.
- The coronal suture, which separates the frontal bones from the parietal bones.
- The frontal suture, which runs between the two halves of the frontal bone. The frontal suture becomes obliterated with time while the other sutures become fixed joints.



The Foetal Skull - The Fontanelles

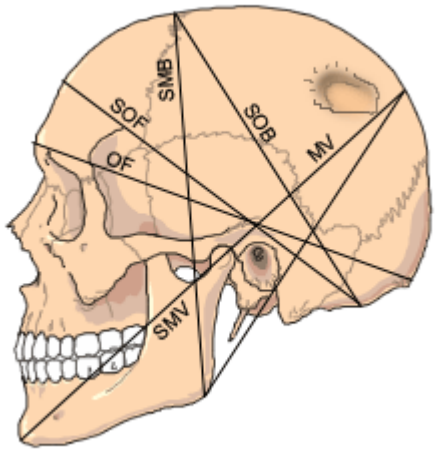
This refers to the point where two or more sutures meet. They include:

- The posterior fontanelle or lambda, which is at the junction of the lambdoidal and sagittal sutures. It is triangular in shape and can be recognised per vagina. Normally it closes at about six to eight weeks of age.
- The anterior fontanelle or bregma is at the junction of the sagittal, coronal and frontal sutures. It is broad and diamond shaped and measures 3 to 4 centimetres long and 2 to 5 centimetres wide. The average time of closure is 18 months, but the fontanelle may close as early as 9 to 12 months.

Diameters of the Foetal Skull

The foetal skull has eight measurements. There are two transverse diameters and six longitudinal or anteroposterior diameters.
The transverse diameters are:

- The biparietal diameter, which is measured between the two parietal eminences and is 9.5 centimetres.
- The bitemporal diameter, which is taken between the furthest points of the coronal sutures and the temples. It measures
  8.2 centimetres.



Key		
Abbreviation	**Diameter**	**Length**
SOB	Sub-occipitobregmatic	9.5 cms
SOF	Sub-occipitofrontal	10.0 cms
OF	Occipitofrontal	11.5 cms
MV	Mentovertical	13.5 cms
SMV	Sub-mentovertical	11.5 cms
SMB	Sub-mentobregmatic	9.5 cms

The longitudinal or anteroposterior diameters are:

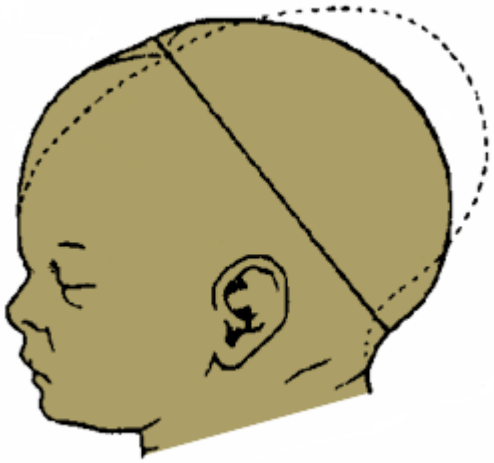
- Sub-occipitobregmatic, which measures 9.5 centimetres running from below the occipital protuberance to the centre of the anterior fontanelle.
- Sub-occipitofrontal, which is 10 centimetres, measured from below the occipital protuberance to the centre or the frontal suture.
- Occipitofrontal, which measures 11.5 centimetres from the occipital protuberance to the glabella.
- Mentovertical, which is 13.5 centimetres, measured from the point of the chin to the highest point on the vertex.
- Sub-mentovertical, which is 11.5 centimetres, measured from the point where the chin joins the neck to the highest point of the vertex.
- Sub-mentobregmatic, which measures 9.5 centimetres from the point where the chin joins the neck to the centre of the bregma.

The Foetal Skull - Moulding

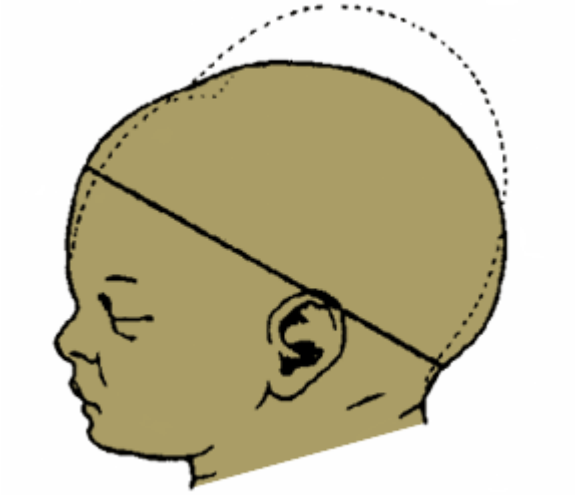
Moulding is the term applied to the alteration in the shape of the foetal head that takes place during its passage through the birth canal. This alteration is possible because the bones of the vault allow a slight degree of bending and the skull bones are able to override at the sutures.

The overriding allows a reduction in the size of the presenting diameters while the diameter at right angles to the presenting diameters is able to lengthen due to the give of the skull bones.

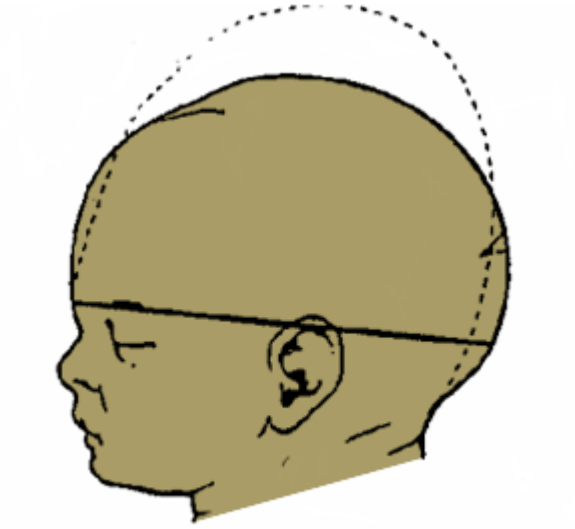
Vertex presentation, head well flexed



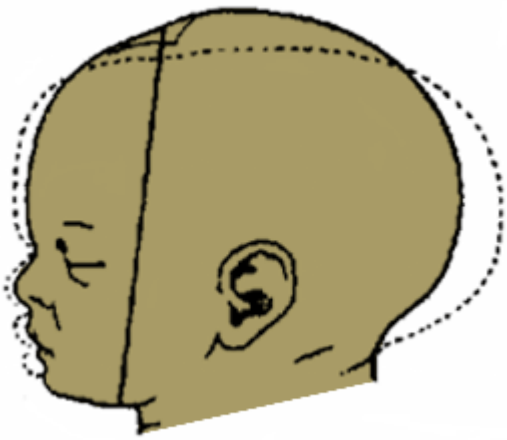
Vertex presentation, head partially flexed



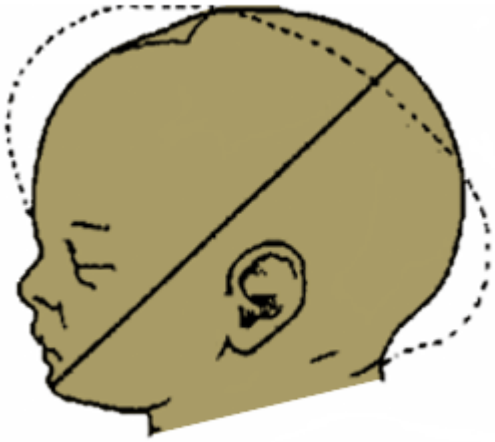
Vertex presentation, head deflexed



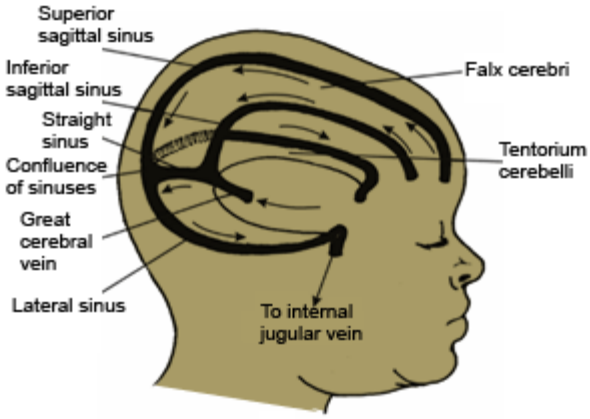
Face presentation



Brow presentation



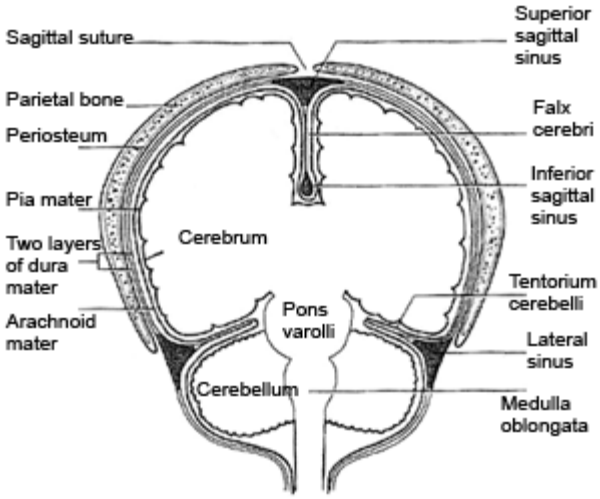
Moulding is a protective mechanism and prevents the foetal brain from being compressed as long as the moulding is not excessive, too rapid or in an unfavourable direction.
If the foetal skull is subjected to abnormal moulding during normal delivery certain structures may be damaged.



The structures that may be damaged as a result of abnormal moulding include:

- The intracranial membranes and sinuses, most importantly, the associated folds of the dura mater and the venous sinuses.
- The falx cerebri, which is a fold of membrane that dips down between the two cerebral hemispheres and runs beneath the frontal and sagittal sutures, from the root of the nose to the internal occipital protuberance.
- The tentorium cerebelli, which is a horizontal fold of dura mater that lies in the posterior part of the skull at right angles to the far cerebri. It is situated between the falx cerebrum and the cerebellum. The membranes contain large veins or sinuses, which drain blood from the brain.

The illustration opposite shows the coronal section through the foetal head to show intracranial membranes and venous sinuses.



SECTION 2: PHYSIOLOGY OF PREGNANCY

Introduction

This section will cover the process of fertilisation, the development of the foetus and physiological changes in pregnancy.

Pregnancy is a critical period for both the woman and her unborn child. It is, therefore, very important for you to understand the physiological changes that occur during pregnancy in order to appreciate the effect they may have on the pregnant woman and to be able to manage her pregnancy appropriately.

Objectives

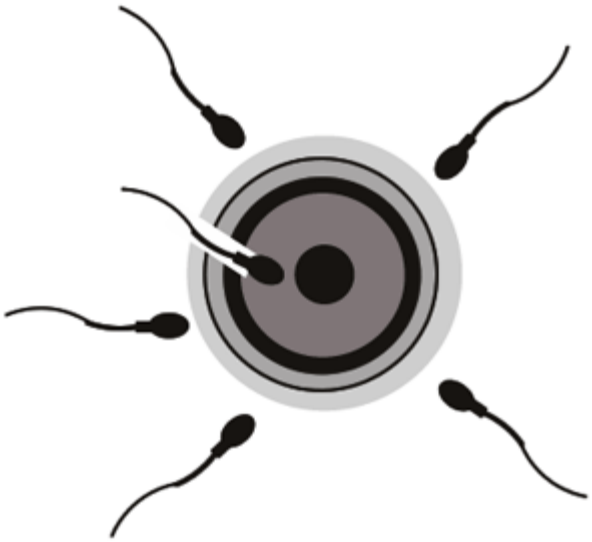
By the end of this section you will be able to:

- Discuss the process of fertilisation and development of the fertilised ovum
- Describe the development of the placenta and its functions
- Discuss the physiological changes that take place during pregnancy

Fertilisation and Development of the Fertilised Ovum

Fertilisation takes place when the sperm meets the ovum in the fallopian tube. After ovulation, the ovum passes into the fallopian tube and is moved along by the cilia and the peristaltic muscular contraction of the tube. At this time the

cervix produces alkaline mucus that attracts the spermatozoa.
When intercourse takes place many spermatozoa (about 300 million) are deposited in the upper vagina. Those that reach the light cervical mucus survive and propel themselves towards the fallopian tubes while the rest are destroyed by the acid medium of the vagina. Many sperm will reach the fallopian tube where they meet the ovum. During this journey the sperm mature and are capable of producing an enzyme known as hyaluronidase, which will help penetration into the ovum. Only one sperm will enter the ovum. After the sperm goes into the ovum, the membrane is sealed to prevent other sperm
from entering.



In order to understand the process of fertilisation you will need to remember some of the basic facts. These are:

- Each nucleus of the human body cell contains 46 chromosomes. These chromosomes are responsible for the transmission of all inheritable qualities.
- The ovum and the spermatozoon each contain only 23 chromosomes, hence when fertilisation occurs, the total 46 chromosomes are established. Thus, some inherited qualities are from the father and some from the mother.
- An ovum always contains one X chromosome.
- A spermatozoon contains either an X chromosome or Y chromosome.
- When a sperm with an X chromosome fertilises an ovum, the combination will be XX. This will give rise to a female. If a sperm with a Y chromosome fertilises an ovum, the combination will be XY. This will give rise to a male.
- The unfertilised ovum stays alive for about 24 hours and spermatozoa for up to 48 hours in the genital tract.

As mentioned earlier, the sperm and the ovum will each contribute 23 chromosomes to make a total of 46 chromosomes. The fertilised ovum is now known as a zygote.
After fertilisation has taken place in the ampulla of the fallopian tube, the zygote goes through the tube and continues until it reaches the uterus three to four days later. During this time, cell division takes place and the fertilised ovum or zygote divides into two cells, then into four and so on until a cluster of cells known as morula is formed. Next, a fluid filled cavity (blastocele) appears in the morula, which now becomes known as a blastocyst. A single layer of cells called the trophoblast, which will later form the placenta and chorion, surrounds the blastocyst. The mass of inner cells forms the foetus and amnion.
Pregnancy begins immediately after fertilisation. This process is then followed by implantation of the developing embryo into the deciduas. Thereafter, there is growth and differentiation of the various organs in the foetus in the first three months of pregnancy.
Development of the placenta and membranes is almost complete by the tenth week of pregnancy.

Formation of the Decidua
The decidua is the name given to the endometrium during pregnancy. From conception, increased secretion of oestrogen causes the endometrium to grow four times more than its non-pregnant size. The endometrial glands become larger, more tortuous and dialled. Blood vessels increase in size. This results in a soft spongy vascular bed in which the zygote implants. Three layers can now be differentiated: the basal layer, the spongy layer and the compact layer.

The Basal Layer
The basal layer lies immediately above the myometrium.
It remains unchanged but will regenerate a new endometrium during puerperium.

The Spongy Layer
The spongy layer, also called functional layer, lies above the basal layer. It consists of tortuous glands rich in secretions, enlarged blood vessels and stroma cells. The chorionic villi invade this layer to form a secure anchorage. This allows them to access oxygen and nutrition. The spongy layer will separate as soon as the baby is born.

The Compact Layer
The compact layer forms the surface layer of the decidua. It comprises the necks of the glands and stoma cells.

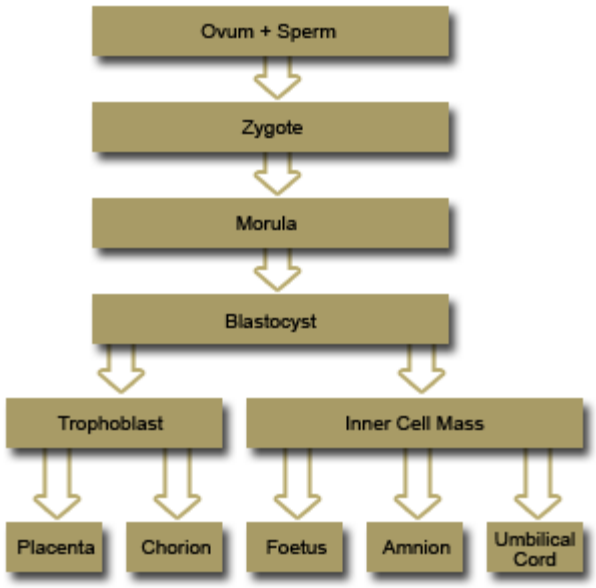
Implantation
This is a process by which the blastocyst burrows into the thickened endometrium known as decidua. This process takes place on or about the sixth day after fertilisation. When the blastocyst enters the uterus, the trophoblast that lies over the inner cells mass becomes sticky and adheres to the endometrium.
The trophoblast secretes an enzyme, which digests the stroma cells and causes a depression in which the blastocyst lies. This digestion continues until the blastocyst is buried in the spongy layer and the site of entry is sealed. The endometrium closes over it completely.
The blastocyst is now referred to as the embryo. The decidua underneath the blastocyst is called the basal decidua, that which covers it is the capsular decidua and the remainder is called the true decidua. Eventually, as the blastocyst grows and fills the uterine cavity, the capsular decidua meets and fuses with the true decidua.
You will now see what happens to the trophoblast and the inner cell mass, which was mentioned earlier.

The Trophoblast
Small projections called chorionic villi appear all over the surface of the trophoblast at the point of contact with the basal decidua. These grow rapidly and obtain nourishment for the growing embryo.
The villi that proliferate are known as Chorion frondosum, which by the twelfth week are fully developed and form the placenta. Those that surround the decidua capsularis degenerate and become the membrane called the chorion.

The Inner Cell Mass
While the trophoblast is developing into the placenta, which will nourish the foetus, the inner cell mass is forming the foetus. The cells differentiate into three layers, each of which forms particular parts as follows:

- The ectoderm, which forms the skin and the nervous system.
- The mesoderm, which forms the bones, muscles, the heart and blood vessels.
- The endoderm, which forms the mucous membranes and glands.
- Two cavities, which appear in the inner cell mass. The amniotic cavity on the side of the ectoderm and the yolk sac on the side of the endoderm.
- The amniotic cavity, which is filled with fluid, enlarges and folds round the embryo to enclose it. The amnion forms the lining. It swells and eventually comes into contact with the chorion.
- The yolk sac nourishes the embryo until the placenta is sufficiently developed to take over.
- Embryo is the name given to the blastocyst for the period from implantation up to eight weeks. During this period all the organs and systems of the body are laid down and thereafter they only grow. From the eighth week through to delivery, the embryo is known as a foetus.

The illustration opposite shows the different stages of the fertilised ovum.
Now you know how fertilisation and implantation take place, move on to look at the placenta and amniotic fluid and their functions.



The Placenta

The fully formed placenta is a spongy disc, circular in shape, about 20 centimetres in diameter, and 2.5 centimetres thick. It weighs about 500 grams and is dark red in colour. It is composed of mainly chorionic villi, which are also known as chorion frondosum. The placenta begins to develop around the fourteenth day after fertilisation, and is fully formed by the sixteenth week of pregnancy.

The placenta has a foetal and a maternal surface. The maternal surface is the one attached to the uterine wall. The foetal surface lies adjacent to the foetus and is covered with amnion, which gives it a shiny appearance.

The placenta is divided into 15 to 20 centimetre lobes by deep grooves. It is made up of 15 to 20 cotyledons and an umbilical cord, which is usually attached near its centre. The umbilical cord has two arteries and one vein.

The developing chorion villi are of two kinds: those that enter deeply into the basal deciduas, anchoring the placenta and shorter ones, which hang loosely in the maternal blood and absorb food, oxygen and excrete waste, known as the nutritive villi. The former are less in number. Mature chorionic villi are tree-like and contain the foetal capillaries network arising from one stem. Each villum is covered with few layers of tissue, which make it impossible for the foetal and maternal blood to mix.

It was mentioned earlier that the placenta is fully formed by the sixteenth week after fertilisation. Foetal blood is pumped by the foetal heart along the umbilical arteries and through their branches to the capillaries in the chorionic villi in the placenta. Here the blood absorbs oxygen and nutrients and is returned via the umbilical vein to the foetus.

Functions of the Placenta

The placenta has several functions as indicated below:

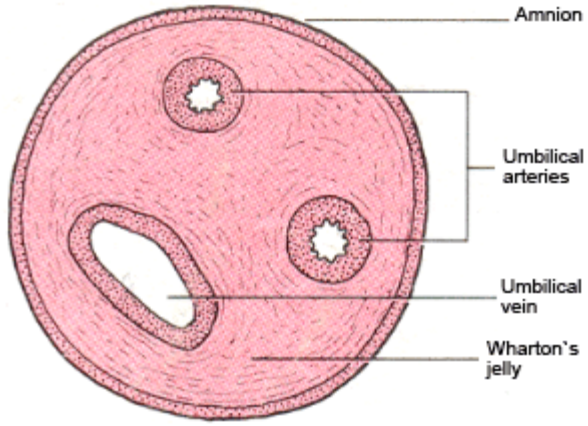
- Respiratory, that is, oxygen from the mother's haemoglobin passes to the foetus and the foetus gives off carbon dioxide by simple diffusion.
- Nutritive, whereby the foetus obtains nutrients from the mother's diet through the placenta.
- Excretory, that is, waste products of metabolism and carbon dioxide are excreted into maternal blood by diffusion.
- Protective, where the placenta acts as a barrier against transfer of infection from the mother to the foetus. However, a few organisms such as the rubella virus and the spirochaete of syphilis are able to pass through.
- Storage, that is, the placenta stores glycogen and re-converts it for use as required and also stores iron and fat soluble vitamins.
- Endocrine, where the placenta acts as an endocrine gland and produces a number of hormones as follows, which include Human Chorionic Gonadotrophin (HCG), oestrogens, progesterone and Human Placental Lactogen (HCL).

The Umbilical Cord or Funis

The umbilical cord extends from the foetus to the placenta. It consists of the umbilical blood vessels, two arteries and one vein. The blood vessels are enclosed and protected by Wharton's jelly and a layer of amnion covers the whole cord.

The length is about 50 centimetres. If it measures 40 centimetres or less, then it is considered to be short. A very long cord may become wrapped around the neck or body of the foetus or become knotted and cause occlusion of blood vessels, especially during labour.

Move on now to discuss anatomical variations of the placenta and the cord.



Anatomical Variations of the Placenta and Cord

Succenturiate Lobe

This is the most significant variation. It is a small extra lobe separated from the main placenta and joined to it by blood vessels, which run through the membranes. It is dangerous because it can be retained in utero after delivery and cause infection and haemorrhage. It is important to examine the placenta carefully after delivery.

Circumvallate Placenta

Circumvallate placenta is when the placenta has two membranes that form an opaque ring on the foetal surface. It is formed by a doubling back of the amnion and chorion and may result in the membranes leaving the placenta nearer the centre instead of at the edge.

Velamentous Insertion of the Cord

This is when the cord is inserted into the membranes. The umbilical vessels run through the membranes from the cord to the placenta. The cord may become detached during active management of the third stage. If the placenta is low lying, the vessels may run across the uterine os. This situation is known as vasa praevia. In this case there is danger of haemorrhage from the foetus when the membranes rupture.

Bipartite Placenta

In this case two separate lobes are present, each with a cord leaving it. The two cords join a short distance from the two parts of the placenta.

Tripartite Placenta

In tripartite placenta, there are three distinct lobes similar to bipartite placenta.

The Foetal Sac

This consists of a double membrane. The outer membrane is the chorion, which lies under the capsular decidua. It becomes closely adhered to the uterine wall. The inner membrane is the amnion, which contains the amniotic fluid.

The Amniotic Fluid (Liquor Amnii)

The amniotic fluid is a clear, pale, straw-coloured fluid consisting of 99% water. The amniotic fluid fills the space enclosed by the amnion which is the innermost membrane enclosing the foetus.
It is constantly in circulation, being excreted by the placenta and the amnion itself. Later in pregnancy, the foetus swallows the amniotic fluid and passes it out as urine.
The amniotic fluid is contained in the foetal sac, which consists of a double membrane. The outer membrane is the chorion and the inner is the amnion. The chorion is a thick, opaque and fragile membrane while the amnion is a smooth, tough translucent membrane. It is derived from the inner cell mass. The foetal sac contains the amniotic fluid and the foetus.
The functions of the amniotic fluid include the following:

- It allows for the growth and free movement of the foetus.
- It guards the foetus against mechanical shocks, that is, it acts like a shock absorber.
- It equalises the pressure exerted by the uterine contractions.
- In the early months of pregnancy, it allows plenty of room for free movement.
- In labour, the bag of fore waters assists the dilatation of the cervix.
- When membranes rupture during labour, the liquor flushes the birth canal from above with fluid that is aseptic and bactericidal.

The source of amniotic fluid is thought to be both foetal and maternal. It is secreted by the amnion, especially that which covers the placenta and the umbilical cord. Some fluid is excluded from the maternal vessels in the deciduas and some from the foetal vessels in

the placenta. Foetal urine also contributes to the volume from the tenth week of gestation onwards.
The normal amount of amniotic fluid is about 600 to 1500 millilitres. If the amount exceeds 1,500 millilitres the condition is known as polyhydramnious and if it is less than 1,300 millilitres, it is known as oligohydramnious. These abnormalities are often associated with congenital malformations of the foetus.

Development of the Embryo and Foetus

The development of the embryo occurs as follows:

0 - 4 weeks:	Primitive central nervous system forms. The heart develops and begins to beat and limb buds form.
4 - 8 weeks:	There is very rapid cell division. Head and facial features develop and all major body organs are in place in primitive form. Early movements are visible on ultrasound.
8 - 12 weeks:	Eyes fuse and kidneys begin to function. From 12 weeks the foetus begins to pass urine. Circulation functions properly and sucking and swallowing begin. Sex is identifiable.
12 - 16 weeks:	There is rapid skeletal development and meconium is present in the gut. Nasal septum and palate fuse.
16 - 20 weeks:	Mother feels foetal movements or quickening. Foetal heart is heard on auscultation.

20 - 24 weeks:	Most organs are able to function and foetus responds to sound. The skin is red and wrinkled.
24 - 28 weeks:	May survive if born at this stage. There is respiratory movement and eyelids open.
28 - 32 weeks:	The testes descend into the scrotum. Foetus begins to store fat and iron. Skin becomes less wrinkled.
32 - 36 weeks:	The body is more rounded because of increased fat deposit and head hair is grown, nails reach finger tips and ear cartilage is soft.
36 - 40 weeks:	Skull is firm and contours rounded. Birth is due.

Foetal Circulation

The foetus does not breathe in the utero. If it did, it would drown in liqour amnii. Since the foetus does not breathe, the blood does not go to the lungs for oxygen. This means that the foetus must get oxygen and nourishment through the placenta, so extra structures are required to provide for this need. Thus the foetus develops its own blood and at no time do foetal and maternal blood mix.

There are five temporary structures in foetal circulation.

The Umbilical Vein
This leads from the umbilical cord to the underside of the liver and carries blood rich in oxygen and nutrients. It has a branch that joins the portal vein and supplies the liver.

The Ductus Venosus
This is a vessel from the umbilical vein to the inferior vena cava, which carries oxygenated blood to the heart.

The Foramen Ovale
This is a temporary opening between the two atria in the foetal heart that allows oxygenated blood to enter the left atrium so as to be pumped out through the aorta.

The Ductus Arteriosus
This vessel connects the pulmonary artery to the descending arch of aorta. It deoxygenates blood from the head and upper limbs thereby bypassing the pulmonary circulation.

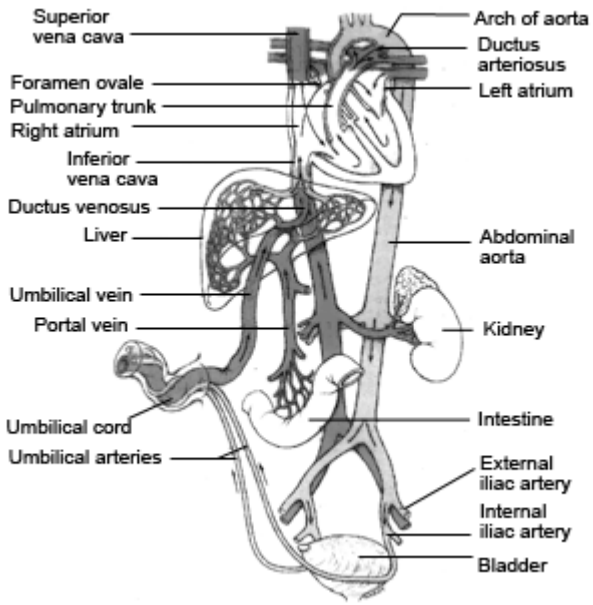
The Hypogastric Arteries

These two vessels branch off from the internal iliac arteries. They are known as umbilical arteries when they enter the umbilical cord.

All foetal blood passes through the placenta to get oxygen and nutrients and to eliminate waste. The course taken by the blood through the foetal circulation is as shown opposite.

The blood takes about half a minute to circulate. Oxygenated blood (50% saturated with oxygen) and nutrients flow through the placenta to the umbilical vein.

The umbilical vein takes the purified blood from the placenta and enters the baby's body at the umbilicus, then runs beneath the anterior abdominal wall to the under-surface of the liver (the liver gets the most oxygenated blood in the foetus). Here it gives off two branches to the left lobe. A small branch is also given off to join the portal vein and takes blood to the right lobe.



The vein now becomes the ductus venosus and carries the blood to the inferior vena cava where it mixes with blood from the lower parts of the body. The blood then enters the right atrium and most of it passes through the voramen ovale into the left atrium. In this way, it bypasses the lungs. The blood then passes through the mitral valve into the left ventricle and out through the aorta. The aorta gives out branches to the head, neck and arms. These, therefore, receive purer blood than any part of the foetal body except the liver.

Deoxygenated blood from the head, neck and arms passes through the superior vena cava to the right auricle and is directed through the tricuspid valve to the right ventricle. From the right ventricle the blood enters the pulmonary artery. A small branch takes a small amount of blood to the functionless lungs. The remaining blood passes through the ductus arteriosus to the aorta to supply the remaining body organs and legs.

The internal iliac arteries lead into the hypo gastric arteries, which return blood to the placenta via the umbilical arteries. The external iliac artery supplies blood to the lower extremities and returns to the inferior vena cava.

The umbilical arteries then pass into the abdominal wall to the umbilical cord at the navel and so reach the placenta where the blood passes through the chronic villi for respiratory and metabolic exchange, ready to circulate through the foetus again.

Adaptation at Birth

At birth, the baby cries and the lungs expand and their vascular field increases. This draws blood to the lungs through the pulmonary arteries, which is then collected and returned via the pulmonary veins to the left atrium. Placental circulation ceases soon after birth reducing blood flow to the right side of the heart, while increasing blood flow to the left side. This causes the foramen ovale to close.

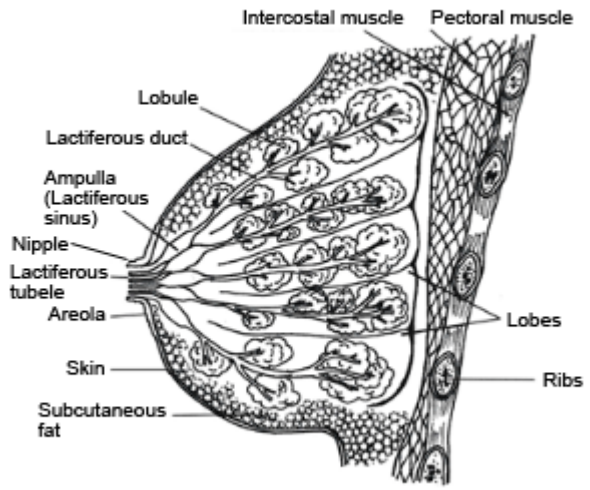
With the establishment of pulmonary respiration, the ductus arteriosus closes and the cessation of placental circulation results in the collapse and drying of the umbilical vein, the ductus venosus and the hypogastric arteries.

The umbilical vein becomes the ligamentum teres, the ductus venosus the ligamentum venosus and the foremen ovale becomes the fossa ovalis. The hypogastric arteries remain open as the superior vesical arteries.

The Breasts

The breasts are secreting glands composed mainly of glandular tissue arranged in lobes (about 20 in number). Each lobe is divided into lobules that consist of alveoli and ducts. The alveoli contain acini cells, which produce milk. The acini cells are surrounded by myoepithelia cells, which contract and relax to propel milk out. Small lactiferous ducts, carrying milk from the alveoli, unite to form larger ducts. One large duct leaves the lobe and widens to form an ampulla (lactiferous sinus) which acts as a temporally milk reservoir. A lactiferous tubule emerges from

each ampulla to the surface of the nipple. Each breast functions independently of the other.



The nipple is composed of erectile tissue, which is covered with epithelium and plain muscle fibres. These muscles have a sphincter-like action which controls the flow of milk. Around the nipple is an area of pigmented skin called the areola, which contains the Montgomery's glands. The glands produce sebum, which lubricates the breasts during pregnancy and throughout breastfeeding.

Blood supply is from the internal and external mammary arteries and branches from the inter-costal arteries. During lactation blood supply is increased. Blood, from the breasts, drains into the mammary and axillary veins. The lymphatic drainage systems of the two breasts communicate freely. This accounts for the rapid spread of malignant growth from one breast to another. The breasts have poor nerve supply and their function is controlled by hormones.

Physiology of Lactation

During pregnancy, oestrogen and progesterone hormones stimulate the growth and secretion of colostrum. Production of milk is inhibited by oestrogen. At the end of the third stage of labour, hormone production is reduced by the delivery of the placenta. This stimulates the anterior pituitary gland to release Prolactin, which initiates milk production. The sucking reflex by the infant stimulates the production of oxytocin by the posterior pituitary gland. The oxytocin is carried in the blood stream to the breasts where it causes the myoepithelia cells to contract and propel milk along the ducts.

You will learn more about breast-feeding in unit three.

Physiological Changes in Pregnancy

It is very important for you to understand the physiological changes that occur during pregnancy in order to appreciate their effects on the pregnant woman. This will enable you to manage her pregnancy appropriately.

Physiological changes in pregnancy take place in the following:

- The reproductive organs
- The cardiovascular system
- The respiratory system
- The renal system
- The gastrointestinal system
- Maternal weight
- Musculo-skeletal system
- The skin

Now move on to look at the physiological changes in pregnancy in more detail.

Changes in the Reproductive Organs

Changes in the Uterus

The uterus provides a nutritive and protective environment in which the foetus will develop and grow. The uterine muscle fibre increases in size (hypertrophy) and in number (hyperplasia). The uterus continues to grow this way for the first 20 weeks, thereafter, it stretches to accommodate its contents. It increases in size from 60 grams - 900 grams.

By the eighth week of gestation it begins to generate small waves of contractions known as Braxton Hicks contractions, which are painless and continue throughout pregnancy. The blood supply to the uterus increases to keep pace with its growth and also to meet the needs of the placenta.

In early pregnancy the uterus becomes globular in shape to accommodate the foetal growth, liquor amnii and placental tissue. This causes pressure on other pelvic organs. For further reading, refer to Myles Textbook 13th Edition

Changes in the Cervix

The cervix acts as an effective barrier against infection. It also protects the pregnancy.

Under the influence of progesterone, the endo-cervical cells secrete mucus, which becomes a cervical plug known as operculum. This plug

provides protection from ascending infection. In late pregnancy, the cervix softens in response to increasing painless contractions. Prostaglandins are thought to have a role in cervical softening in readiness for the onset of labour.

Changes in the Vagina
Oestrogen causes the vagina to become more elastic. These changes will allow dilatation during the second stage of labour to receive the descending foetal head.
There is an increased amount of the normal white vaginal discharge called leucorrhoea. The vaginal ph becomes more acidic to provide protection to some micro-organisms but also increases susceptibility to others such as candida albicans.

Changes in the Cardiovascular System
The cardiac output increases from 5 litres to 7 litres per minute by late pregnancy. This is caused by an increase in resting heart rate of about 15 beats per minute by the end of pregnancy and an increase in blood volume.
The red cell mass increases by about 18% by the end of the pregnancy. The plasma volume increases from the tenth week of pregnancy and reaches its maximum level of 50% above non-pregnant values by the 32nd to 34th week, and maintains this until term.
As the plasma increase is greater than that of the red cell mass, there is haemodilution effect. This results in lowered haemoglobin level. This effect is referred to as physiological anaemia. The mean acceptable HB level in pregnancy is 10 - 12 g/dl of blood.
Despite these changes the blood pressure remains normal. The increased cardiac output does not affect the blood pressure. It may drop slightly by mid-trimester and towards term it returns to the level of the first trimester.

Changes in the Respiratory System
The respiratory rate does not alter but the amount of air inhaled per minute increases from 7 to 11 litres.

Changes in the Renal System
Progesterone relaxes the walls of the ureters and allows dilation and kinking. This tends to result in a slowing down or stasis of urinary flow, making infection a greater possibility.

Changes in the Gastrointestinal Tract
There is increased salivation. Women often experience changes in their sense of taste, leading to dietary changes and food cravings. Craving for substances such as bricks/soil is known as pica.
Progesterone relaxes the smooth muscles. Gastric emptying and peristalsis are reduced in order to maximise the absorption of nutrients. Heartburn is common and is associated with gastric reflux due to relaxation of the cardiac sphincter. Constipation is also common due to sluggish gut motility. Nausea and vomiting occur mainly during early pregnancy as a result of raised hormonal levels.

Changes in Maternal Weight
There is continuous weight increase during pregnancy, which is due to the foetus and fat deposition. The expected weight gain is approximately 2 kilograms in the first 20 weeks followed by an average of 0.5 kilogram per week until term leading to 12 kilograms in total.

Changes to the Musculo-Skeletal System
Progesterone encourages relaxation of ligaments and muscles. This increases the capacity of the pelvis in readiness for labour. The unstable pelvic joints result in the rolling gait sometimes seen in pregnant women. In the multigravidae, this is likely to cause backaches and ligamental pain especially in the hip joint.

Changes to the Skin
During pregnancy, there is increased activity of the melanin-stimulating hormone causing deeper pigmentation. Some women develop deeper, patchy colouring on the face known as chloasma. Many develop a pigmented line running from the pubis to the umbilicus known as linea nigra. Others may develop thin stretch marks called striae gravidarum. The increased blood supply to the skin leads to sweating. Women often feel hotter possibly due to progesterone-induced rises in temperature of 0.45℃ together with vasodilation.

Changes in the Breast
The breast enlarges due to increased tissue growth, blood supply and fat deposition. Deposition of melanin toughens the nipple area in preparation for breastfeeding.

UNIT TWO PART TWO: PREGNANCY

In part one of this unit you covered the anatomy and physiology of the female reproductive system and the physiological changes that take place during pregnancy.
In this unit you will cover the management of normal pregnancy, the risk factors during pregnancy and how to manage them.
This unit is composed of two sections:
Section One: Management of Normal Pregnancy.
Section Two: Risk Factors in Pregnancy.

Unit Objectives

By the end of this unit you will be able to:

- Explain management of normal pregnancy
- Describe risk factors in pregnancy and their management

SECTION 1: MANAGEMENT OF NORMAL PREGNANCY

Introduction

In this section you will cover the management of normal pregnancy, which includes prenatal care, the management of minor disorders and the drugs used in pregnancy. Remember that a successful pregnancy and delivery depend to a great extent on the care given right from conception to delivery. The knowledge, skills and attitudes acquired will enable you to manage mothers competently.
As you progress, reflect upon the topics that were covered in part one of this unit, that is, fertilisation, development of the foetus, physiological changes in pregnancy, the breast and lactation. The knowledge you gained will be applied as you go through this section.

Objectives

By the end of this unit you will be able to:

- Diagnose pregnancy
- Explain the routine management of a pregnant woman
- Differentiate the physiological changes from the minor disorders of pregnancy
- Familiarise yourself with the current obstetric pharmacology
- Describe treatment that midwives are allowed to prescribe in their professional capacity

Diagnosing Pregnancy

You will start by looking at the diagnosis of pregnancy and defining some of the terms commonly associated with pregnancy.

- Trimester refers to a three month calendar period.
- Gravidity is the number of times a woman has been pregnant regardless of the outcome of the pregnancies.
- Parity refers to the delivery of a child that grew beyond 28 weeks (the age of viability) irrespective of whether the baby was born alive or dead.
- A Primigravida is a woman who is pregnant for the first time.
- A Primipara is a woman who has had only one delivery.
- A Multigravida is a woman who has had two or more pregnancies.
- Multipara refers to a woman who has had two or more deliveries.
- Nullipara is a term that refers to a woman who has never delivered.
- A Grand multipara is a woman who has had six or more deliveries.

Remembe
If a woman keeps on aborting before the 28th week, she becomes a multigravida but will remain nullipara.

The average duration of pregnancy is 266 days. This is counting from the time the pregnancy started, which is after ovulation and approximately two weeks after the first day of the Last Normal Menstrual Period (LNMP). If the counting is made from the first day of the LNMP, then the duration is 280 days or forty weeks.
The duration of pregnancy can also be expressed in months. These can be calendar months or lunar months. A lunar month is the time from one new moon to the next. It is equal to four weeks or exactly 28 days. A calendar month is longer, usually 30 or 31 days. Therefore, on average, pregnancy lasts 40

weeks, that is, ten lunar months or approximately nine calendar months.
The diagnosis of pregnancy is made on the basis of symptoms, signs and investigations of pregnancy. These can be conveniently divided into those of the first, second and third trimester.

Signs and Symptoms of Pregnancy

The main symptoms and signs during the first trimester include:

- Amenorrhoea
- Enlargement and tenderness of the breasts
- Nausea
- Excessive salivation (ptyalism)
- Frequency of micturition due to the pressure of the gravid uterus on the urinary bladder
- Constitutional symptoms (that is, tiredness, weakness and sometimes depression)

As previously mentioned, a pregnant woman often experiences tiredness, general weakness and sometimes depression. The real cause of these symptoms is not established but may be hormonal. These symptoms usually improve by the 16th week after the last menstruation.
As the pregnancy progresses more signs and symptoms are observed. You will cover each of these in a little more detail.

Enlargement of the Breasts

The nipple and the areola increase in size. Small nodules, known as Montgomery's tubercles, develop around the nipple. The areola darkens.

The Cervix

The cervix becomes bluish in colour, which is referred to as Jacquemier's sign, because of the increased vascularity and congestion with blood. It also becomes softer. When you perform a bimanual vaginal examination with two fingers inserted in the anterior fornix of the vagina, and the other hand placed behind the uterus abdominally, the fingers of both hands almost meet because of the softness of the isthmus. This is known as Hegar's sign. It is most marked between the 6th and 12th week of pregnancy. There is also an increased pulsation felt in the lateral fornices, which is known as Osiander's sign. The uterus is slightly enlarged.

Quickening

This is when a mother feels the first movements. Primigravidae recognise these movements at about the 20th week, and the multipara at about the 16th week.

Uterus Enlargement

This occurs around the 12th week. You should be able to feel the enlarged uterus abdominally just above the symphysis pubis. The fundus reaches the level of the umbilicus at about the 22nd week, and the xiphisternum by the 36th week.

Foetal Identification

You should be able to feel the foetal parts, for example, the head, from the 24th week onwards. You might be able to feel foetal movements while palpating the fundus. Foetal heart sounds can be heard around the 24th week. The rate varies from 120 to 160 beats per minute.

Investigations

Now that you are aware of the symptoms and signs of pregnancy, you will look at the investigations that may be carried out to confirm pregnancy.
When diagnosing pregnancy, it is not always necessary that you carry out investigations. However, it is important for you to know the kind of investigations that may be done.

Pregnancy Test

This depends on the Human Chorionic Gonadotrophins (HCG) secreted in the mother's urine. It is more likely to be certain when the urine is concentrated, that is, a fresh, clean, early morning specimen. With a sensitive test, HCG can be detected in maternal plasma or urine by eight to nine days after ovulation.

The Ultrasound

This is a scanner, which enables you to see the foetus and its cardiac activity, particularly if performed by the 6th week of pregnancy.

X-ray Method

By the 16th week, if an x-ray is performed, it will show foetal bones. This is an undesirable method of diagnosing pregnancy because in early or mid-pregnancy, the foetus is very susceptible to the adverse effects of radiation.

Signs and Symptoms of Pregnancy

SIGN	TIME OF OCCURRENCE (Gestational age)	DIFFERENTIAL DIAGNOSIS
Possible (presumptive) signs		
Early breast changes (unreliable in the multigravida).		
Amenorrhoea	3-4 weeks +	Contraceptive pill
Morning sickness	4 weeks +	Hormonal imbalance, Emotional stress, Illness
Bladder irritability	4-14 weeks	Gastrointestinal disorders, Pyrexial Illness, Cerebral irritation etc.
Quickening	6-12 weeks	Urinary tract infection, Pelvic tumour
	16-20 weeks+	Intestinal movement, 'wind'
Probable Signs		
Presence of hCG* in: Blood Urine	 4-12 weeks 6-12 weeks	 Hydatidiform mole Choriocarcinoma
Softened isthmus (Hegar's sign)	6-12 weeks	
Blueing of vagina (Jacquemier's sign)	8 weeks	
Pulsation in fornices (Osiander's sign)	8 weeks	Pelvic congestion
Uterine growth	8 weeks	Tumours
Braxton Hicks contractions Ballottement of foetus	16 weeks 16-28 weeks	
Positive signs		
Visualisation of foetus by: Ultrasound X-ray	 6 weeks + 16 weeks +	 No alternative diagnosis

Foetal heart sounds by: ultrasound foetal stethoscope Foetal movements: palpable visible Foetal parts palpated	 6 weeks+ 20-24 weeks + 22 weeks + late pregnancy 24 weeks +	

Key

* Human Chorionic Gonadotrophin
\+ Onwards

Routine Management of the Pregnant Woman

In unit one of this module you were introduced to the Safe Motherhood Initiative (SMI) and child survival. You learnt that one of the pillars of safe motherhood and child survival was antenatal care. In this section you are going to study antenatal care in detail.

The Aims of Antenatal Care
Did you think of this?
Antenatal care is the care you give to a pregnant woman to ensure that she reaches the end of her pregnancy both physically and psychologically healthy and that she delivers a healthy baby.
Good quality antenatal care always includes:

- Diagnosing the pregnancy before 24 weeks
- Regular blood pressure checks, testing for oedema, and urine examination
- Regular abdominal examination
- The recognition of high risk cases and their referral for special care
- Immunisation against tetanus to both the mother and unborn baby
- Treating of minor complications

Remember:
Good antenatal care must include the development of a relationship of trust between the health worker, the pregnant woman and, if possible, her family.

In order for you to provide good quality antenatal care, you must achieve the following aims:

- Make the mother aware of the benefits offered by your clinic both during pregnancy, at the time of delivery, and afterwards.
- Advise the mother on how to look after herself and her baby. You should also advise on a balanced diet, and activities likely to improve and maintain her health and that of her baby.
- Prepare her psychologically and physically for delivery. Do this by allaying her fears and counselling on harmful beliefs and practices.
- Give prophylactic treatment against anaemia and vaccination against neonatal tetanus.
- Identify those 'at risk', that is, women who might have problems during pregnancy or labour, and correct the abnormalities or refer to hospital for management of the pregnancy or delivery.
- Help a mother to make an Individual Birth Plan (IBP).
- Help the mother prepare for, and learn how to take good care of the child physically, psychologically and socially.

You will now look at factors that influence the maternal and perinatal mortality rates.

Maternal mortality refers to the death of the mother during pregnancy or within 42 days after the termination of pregnancy. The cause may be related to or aggravated by pregnancy, labour or puerperium. Data from the 2003 Kenya Demographic Health Survey (KDHS) estimated maternal mortality ratio at 414 maternal deaths per 100,000 live births.

Perinatal mortality includes stillbirths, which is the death of the foetus after 28 weeks and neonatal deaths, that is, death during the first week of life. According to the 2003 KDHS, the

results indicate that perinatal mortality rate is 40 deaths per 1,000 pregnancies.
A successful outcome of the pregnancy depends on the following two general factors:

- The reproductive efficiency of the mother
- The standard of obstetric care

The reproductive efficiency of the woman, in turn, depends on the following factors:

- The age of the mother
- Her parity
- Her physique and stature
- Her general state of health

You will now cover each factor separately, starting with the age of the mother.

Age of Mother
The optimum age for child bearing is between the age of 18 and 35 years. Pregnancy occurring below 18 years of age leads to a high incidence of prematurity and perinatal mortality rate. Since adolescent girls have not yet grown to their full stature, obstructed labour with all its disastrous results is very common.
After the age of 35, babies are usually considerably large, and the pelvic joints stiffer, thus they do not give room easily. Uterine dysfunction with slow dilatation of the cervix is common. Childbearing towards the end of the woman's reproductive life carries additional risk. Hypertension, other vascular diseases, and renal degenerative conditions begin to appear, leading to placental insufficiency.

Parity
The risks in pregnancy for the mother and child are relatively high in the first pregnancy. They then drop sharply in the second and third and then slowly rise in subsequent pregnancies. Therefore, by the sixth pregnancy the risks to this multipara exceed those of the primigravida and thereafter rise more steeply with each pregnancy.
A grand multipara is likely to get complications in pregnancy and labour.

Iron deficiency anaemia, which occurs because pregnancy and lactation deplete the woman's iron stores.

Malpresentation because of over relaxed abdominal muscles, that is, muscles that are not firm.

Uterine rupture due to obstructed labour and malpresentation.

Postpartum haemorrhage, which occurs because the uterus has fibrous tissues and is overstretched due to repeated pregnancies. This causes uterine atony. This occurs when the uterine muscle has lost the tone.

Cephalo-pelvic disproportion, that is, babies tend to be larger with each succeeding pregnancy. Disproportion may, therefore, occur after many subsequent pregnancies.

Remember:
As a health worker you should not unduly rely on the security of a good past obstetric history. If you do, you may easily overlook signs of trouble in pregnancy or labour in a multipara.

Physique and Stature
The maternal height is a very valuable measure of reproductive efficiency. In any community, the shortest height group has the highest perinatal mortality and the highest prematurity rate. Women below 150cms by height are at risk of cephalo-pelvic disproportion. On the other hand, women who are obese are more at risk of getting pre-eclampsia.

Maternal Health
The reproductive efficiency of the woman also depends on the woman's general state of health. If she starts off her pregnancy in poor health, she is likely to deteriorate throughout her pregnancy.

Factors that make a woman more vulnerable to a difficult pregnancy

- Low social status, which means the woman, may not be able to afford good nutrition or medical care. She, at the same time, is likely to live in a poor environment, conducive to infections.
- A large family to take care of, which is likely to increase stress and predispose her to other diseases such as high blood pressure.
- Poor nutrition because of frequent and closely spaced pregnancies, when a woman's body is depleted of nutrients. This is known as maternal depletion syndrome. Also, because of certain beliefs and taboos, some women regard some foods such as eggs as harmful to them during pregnancy.

- Infectious diseases, because immunity to infection is weakened during pregnancy. Infections such as AIDS, malaria, amoebic dysentery, and infective hepatitis, are particularly severe during pregnancy.
- Anaemia, which is caused by a number of factors such as hookworm infestation, is common in rural areas, especially where there are no latrines. You will learn more about anaemia in pregnancy in section two of this unit.
- Many women still deliver without the care of a skilled attendant. People who are unskilled and untrained still deliver many women in unhygienic conditions. There is a high risk of rupture of uterus and other complications.

Antenatal Care

Activities at the First Antenatal Visit

The first antenatal visit should take place as early as possible, preferably in the first trimester. It is an opportunity to collect baseline data about the mother, for example, weight, blood pressure and so on. This baseline data is important because it forms a basis for comparison during later visits. Also, during the first visit, any other abnormalities can be detected and treated before they have a detrimental effect.

The activities of the first visit include:

- Registration
- Height and weight measurement
- History taking
- Physical examination
- Laboratory examination
- Management of complaints
- Immunisation
- Health Education

You will now review each of these activities in a bit more detail.

Registration

Every pregnant woman that comes to the antenatal clinic should be registered and given an antenatal card.

Weight and Height Measurement

Measure height and weight and record them on the card. A woman with a height below 150cms is likely to have cephalo-pelvic disproportion. Excessive weight gain, that is, more than 1kg per week indicates accumulation of fluid in the tissues (oedema). A lack of increase in weight or weight loss may mean malnutrition.

History Taking

When you take the history you should include the following:

- Particulars of the mother, which include the name, age, marital status, religion, and address.
- History of the present pregnancy, which includes the date of the first day of the last normal menstrual period, the parity and gravidity. From this, calculate and record the Expected Date of Delivery (EDD) by adding seven days to the first day of the last normal menstrual period and subtracting three months from that month. For example, if her last period started on 18th June, 18 plus 7 gives you 25. Then June minus three months, (6-3) will give March. So the EDD is March 25th of the following year.
- Gynaecological history, which will include the menstrual history, any past operations for gynaecological complaints and Sexually Transmitted Infections (STIs).
- Past obstetric history, for which you should ask the mother about the outcomes or complications of each of the previous pregnancies. Inquire into whether she delivered at home or at a hospital. Ask for the birth weights of the children, whether they were breastfed and whether they are alive or not.

General Medical History

Ask about any serious medical diseases likely to affect pregnancy and labour such as heart diseases, diabetes mellitus, renal diseases, tuberculosis and sickle cell disease.

Surgical History

Find out about injuries to the pelvis and spine, operations on the abdomen and blood transfusion.

Physical Examination

A thorough examination is made at the first visit. This is divided into a general examination and an obstetric examination. The general examination should include:

- General appearance, namely the nutritional status, whether weak or sick

looking. Note the gait and if she walks with a limp.

- Height, noting that any woman below 150cms in height is likely to have cephalo-pelvic disproportion.
- Weight, that is, a pregnant woman on average gains 2kg every month. The total weight gain by the end of pregnancy is about 10-20kg. Excessive weight gain indicates accumulation of fluid in the tissues (oedema). Lack of increase in weight or loss may mean malnutrition. Obesity may lead to an increased risk of gestational diabetes.
- Blood pressure, which is taken in order to ascertain the normal and provide a baseline for comparison. A pressure of 140/90mm/Hg at booking is indicative of hypertension and could cause damage to the placenta.
- Signs of anaemia in conjunctiva, hands and tongue.
- Check for oedema of face, hands and ankles
- Observe type of breathing and chest generally for abnormalities.

Breast Examination

Palpate gently with the flat of the hand to feel for any lumps. Check if the nipple is protractile. Educate the woman on how to examine the breasts by herself.

Obstetric Examination (Abdominal)

An obstetric examination aims at:

- Observing for signs of pregnancy
- Assessing foetal size and growth
- Assessing foetal health
- Diagnosing the location of foetal parts
- Detecting any deviation from normal

The client is asked to empty her bladder and then to lie on her back on a couch with the arms by her sides. Inspect the abdomen for the shape, size, scars and foetal movements. Any abnormality detected is referred for further investigations.

Estimate the height of the fundus and compare it with the weeks of amenorrhoea. This helps you to assess foetal growth and detect any deviations from the normal. Check for varicosities at the back of the leg. Ask the woman to remove any tight clothing at the leg. At this time it is also important to check for phlebitis by looking for any reddened areas.

Palpate the sides of the abdomen to locate the foetal back in order to determine the position. You do this by facing the patient and then supporting the uterus with your right hand. Keep pushing the foetus with your left hand towards the right. Reverse the order to feel the left side of the uterus.

Palpate the lower pole of the uterus, just above the pelvic brim. Ask the mother to bend her knees slightly in order to relax the abdominal muscles and ask her to breath steadily with her mouth open. Facing the foot of the bed, mark the brim of the pelvis with your hands and cup what presents between them. If the head is presenting, a smooth surface will be felt. If you do not find the head in the pelvic brim or at the fundus, suspect a transverse lie. This will be significant only after the 36th week of gestation.

The foetal heart sounds are listened to last, so as to assess the foetal wellbeing. The Pinard's foetal stethoscope is commonly used to hear the foetal heart.

As you perform the physical examination, talk to the mother and check her facial reaction as you palpate the abdomen. When you complete the procedure reassure the mother.

Findings of Abdominal Examinations

All these are recorded upon completion of the exercise and they include:

- Gestational age, which is estimated as per the size of the fundus.
- Lie, which refers to the relationship between the long axis of the foetus and that of the mother and can either be longitudinal, transverse or oblique.
- Attitude, which refers to the relationship of the foetal head and limbs to its trunk. It is most commonly flexion.
- Presentation, which means the foetal part that is lying at the pelvic brim or in the lower pole of the uterus and can either be vertex, breach, face, shoulder or brow. The most common is the vertex. Note that vertex/brow/face all refer to head presentation.
- Denominator is the name given to the presenting part for example, occiput for vertex, sacrum for breech and mentum for face.
- Position, which refers to the relationship between the denominator of the presentation and the landmarks of the pelvic brim.

Laboratory Investigations

There are several types of laboratory investigations. These include:

- Haemoglobin estimates
- Urine testing for proteins, sugar and microscopy
- Stool examination for ova and cysts
- Blood test for syphilis, usually VDRL
- Blood group and Rhesus factor
- Elisa for HIV after pre-test counselling

Health Education

Immunisation

The first dose of tetanus toxid (0.5mls) should be given at first contact or as early as possible during pregnancy. The rest of the doses (four) are given as per schedule on the immunisation card.

Antenatal Clinics

The antenatal clinic visits are an ideal time to educate mothers about a variety of health issues pertaining to their health and that of their children. The best way to ensure that every mother gets maximum health information is to have a regular schedule of topics to be covered at each antenatal visit.

Write down a programme for health education of mothers. List the topic you will cover at each clinic visit and the points of emphasis for each topic.

Visit	Topic	Points of Emphasis
1.		
2.		
3.		
4.		

When you are giving health information, you should emphasise on the following:

- Keeping antenatal and immunisation cards safely.
- Visiting antenatal clinic as planned, that is, before sixteen weeks, between 16-24 weeks, between 24-34 weeks and after 34 weeks, unless complications arise.
- Taking a balanced diet and plenty of rest.
- Avoiding drugs, unless prescribed by a health worker. You should emphasise the dangers of smoking and alcohol consumption.
- Maintaining good personal hygiene.
- Seeking medical advice in case of ailments.

There are various topics that may also be discussed with mothers-to-be during community health talks. You will now cover some of them.

Nutrition

A balanced diet is emphasised for the health of the woman and the developing foetus. A balanced diet contains protein, carbohydrates, fat, fibre, vitamins and minerals.

Preparation for the Newborn

Prepare the mother for delivery. Advise what clothing to prepare for the coming baby, as well as on how to prepare for her changing role as she becomes a mother. She should also be ready for delivery in a hospital or health centre.

Care of the Newborn

Educate the mother on exclusive breastfeeding, keeping the baby warm, cord care and warning

signs of infection such as septic cord, fever, and refusal to breastfeed.

Breastfeeding
The socio-cultural changes that discourage mothers to breastfeed need to be detected and dealt with promptly.
Employers and the society at large need to support the mothers in the breastfeeding endeavour.

The Advantages of Breastfeeding

- Breast milk is clean, while powdered milk usually gets contaminated by the water used to mix it or by being put into a dirty bottle. This may lead to diarrhoea and death.
- Breast milk is a balanced food for the baby, while powdered milk often results in fat or thin babies.
- Breast milk is always available while powdered milk is imported and expensive.
  Thus, breast milk is cheaper.
- Breast milk contains protective antibodies while powdered milk, if badly handled, will contain bacteria.
- Breastfeeding brings close body contact between mother and baby. There is psychological satisfaction and the mother and baby develop a strong relationship, which leads to good social adjustment later in life. Tell the mother to put the baby to the breast immediately after birth.
- Breast milk is at the right temperature all the time.
- Breast milk contains a substance that promotes absorption of iron from the baby's gut.

Care of Breasts and the Newborn
Advice on the care of the breasts is particularly important in any primigravida. Check if the woman has inverted or 'turned in' nipples and check for any cracks. The idea of teaching mothers to do nipple stretching exercises and massaging nipples to push out inverted nipples is no longer recommended. This is because this can damage the nipple and sometimes causes uterine contractions and premature labour .
After delivery, if the baby is very reluctant to suck, the mother should express the milk into a clean container and feed the baby with a cup and teaspoon.

Many women deliver at home due to poor road communication to the health facilities. In such circumstances, you should emphasise the need to cut the cord with a new razor blade fresh from its wrapping and, therefore, free from tetanus spore contamination.
You should discourage the use of cow dung and similar local medicament on the umbilical stump.
A discharging or red eye is a serious problem in the newborn and needs medical attention.

Immunisation
Educate the woman on the immunisations she is to receive during her pregnancy period, for example, tetanus toxoid, and their importance. At this point it is also necessary to inform her about the immunisation the baby will receive, at what age, duration and their importance.

Complications of Pregnancy
These include excessive vomiting, vaginal bleeding, excessive swelling of the ankles and face and persistent frontal headache among others. Highlight the importance of seeking early medical attention.

Sexually Transmitted Infections
Underline the importance of having safe sex and the effect of sexually transmitted infections to the unborn child. At this point, it is important to inform the woman of the signs and symptoms of some of the most common STIs, and the importance of seeking treatment, together with her partner.

Family Planning
The importance of family planning should also be emphasised. The available methods and their effects should be outlined, so that she is able to decide on the method of her choice immediately after delivery.

Alcohol and Smoking
Alcohol gives rise to foetal problems. Therefore, a woman is best advised to stop drinking prior to conception, or immediately she realises she has conceived. Smoking, likewise, has adverse effects to both the mother and the unborn child, and should also be avoided.

Sexual Intercourse
Sometimes, sex during pregnancy is feared to have adverse effects on the baby. It is important for a midwife to advise the couple that sex is

safe except in special conditions, for example, if a woman has had frequent miscarriages.

Remember:
While giving the health education, let the woman or couple raise their fears or concerns, as different people perceive pregnancy differently.

Follow-up Antenatal Visits
Can you think of the importance of follow-up visits?

The main aim of follow-up visits is to check the general health of the mother and to ascertain the rate of growth and welfare of the foetus. You would
also check the lie and presentation of the foetus so
as to determine the expected mode of delivery. It is also an opportunity to allay any anxiety or fears
in the mother about the pregnancy or labour.

Remember:
The wellbeing of the foetus is indicated by an increasing maternal weight that is proportional to the increasing uterine size and is compatiblewith gestational age, regular foetal movements tha follow a regular pattern, and foeta heart rate of between 110-150 beats per minute.

During follow-up visits, your activities should include the following:

- A short history should be taken in which you ask how she has been, ask about her appetite, sleeping habits, vaginal discharge or bleeding, headaches which are persistent and swelling of the feet.
- Estimate the fundal height; determine the foetal lie, position and presentation. Auscultate the foetal heart rate and note its rhythm.
- Treat any minor ailments and refer major ones to hospital. Give ferrous sulphate and folic acid as prophylaxis for anaemia.
- Give health information at every visit. Always give the woman information about her present condition and a return date for the next visit.
- Give malaria prevention treatment, that is, sulphur based drugs, with the first dose during the second trimester and second dose during the third trimester.

Remember:
As you carry out the activities previouslycovered,you willalso need to be able to identify women who fall in the high-risk and low-risk groups in your health facility.

You will now look at the low risk ailments or minor disorders of pregnancy. Major disorders of pregnancy will be covered in the next section.

Low Risk Ailments (Minor Orders of Pregnancy)

These remain minor as long as they do not pose much risk to the life of the mother and the baby. They are mainly caused by hormonal, accommodation, metabolic and/or postural changes. They include backache, constipation, abdominal cramps, heartburn and morning sickness.

Remember:
Minor disorders may escalate and become serious complications of pregnancy. Therefore, as a health provider you have to be alert to the development of any complications and refer appropriately.

You will now cover the management of each minor disorder.

Nausea and Vomiting (Morning Sickness)
As mentioned in the previous section, this is mainly caused by a rise in hormonal levels. It occurs between four and sixteen weeks, usually in the morning hours, but it can occur at any time of the day. When vomiting becomes severe, it is called hyperemesis gravidarum. This condition will be discussed in the section on risk factors in pregnancy.
Advise the woman to take carbohydrate snacks at bedtime and in the morning before rising. At this point, it is important to rule out other causes of vomiting.

Heartburn
This refers to a burning sensation that is felt at the medistinal region due to reflux of gastric contents into the oesophagus through the cardiac sphincter that is relaxed by the increased levels of progesterone. It is prevalent between 30 to 40 weeks.

Advise the affected woman to avoid bending over, to take small meals, to sleep with several pillows and to lie on her right side in a semi-reclining position. If this condition persists, give anti-acids and refer.

Constipation
This occurs due to reduced gastric motility caused by to the increased levels of progesterone. Advise the woman to take plenty of water, fresh fruits, vegetables and wholemeal foods. Inform her of the importance of taking a glass of warm water in the morning before breakfast as this will help in activating the gut. Exercise is of great importance too.

Backache
Backache occurs due to softening of the ligaments that is caused by hormones. Advise the woman what causes this problem and reassure her that it will be over after the pregnancy.

Obstetric Pharmacology

This is the study of the actions and effects of drugs on the foetus and the gravid uterus. Although the placenta forms a barrier between the foetal and maternal circulations, the drugs can still cross it. Drugs that are lipid, that is, fat soluble, can only cross if present in high concentrations. Water soluble drugs on the other hand, cross the placental barrier easily.
Once a drug has crossed to the foetus, it may persist there for a long time. This is due to the poor development of the mechanisms necessary to excrete the drugs.
The possible bad effects of drugs on the growing foetus are expressed by the term 'teratogenic', which means the making of monsters or abnormal children. Drugs with such properties are particularly dangerous soon after implantation when the majority of the foetal organs are being formed. This is the stage of organ formation or organogenesis. However, even later, the use of drugs carries risks as the central nervous system develops throughout pregnancy.
The high risk period, therefore, is the first 12 weeks of pregnancy, especially three to eight weeks from the first day of the last normal menstrual period.

Remember:
Do not give drugs to pregnant women. If you must give drugs for a serious medical condition, check first to make sure that the particular drug you are giving is safe in pregnancy.

What do you think the bad effects of drugs may be on the foetus?

Did you think of the following?
Drugs crossing the placental barrier may act directly on the foetus or indirectly on the placenta by impairing its function. They may reduce blood supply to the uterus or may affect the maternal hormonal balance.

Specific Dangers of Drugs
The danger the drugs may cause will depend on the stage of pregnancy during which the drug has been taken.

Drugs in Early Pregnancy
Early pregnancy is a time characterised by nausea, vomiting and occasionally depression. Antiemetic drugs, used to stop vomiting, are dangerous to the foetus and should be avoided whenever possible. In particular, the following should be avoided:

- Antiparasitic agents
- Anti cancer drugs, for example, methotrexate
- Strong antibiotic agents
- Antiviral agents

Drugs in Late Pregnancy
Drugs given in late pregnancy may not cause gross anatomical defects but they can affect the foetus in other ways, including the following:

- Androgens or progesterone can cause foetal masculinisation
- Iodine and anti thyroid drugs can cause goitre
- Tetracycline can interfere with bone and tooth development

Drugs Just Before Labour
Drugs given at this time may accumulate in the foetal circulation. The foetal liver is not mature enough to be able to excrete them. Anticoagulants will cause severe neonatal haemorrhage. Sulphonamides can cause jaundice. Chloramphenicol results in a general

collapse of the baby, which is also known as the grey baby syndrome.

Drugs During Labour
Any drug which acts to depress the respiratory system, such as those given to the mother to relieve pain, will make the newborn have difficulty in starting respiration. Barbiturates and anaesthetic agents may depress the newborn's respiration.
As a general principle drugs, should be avoided throughout pregnancy, and especially in the first 12 weeks. You should attempt to cope with the mother's problems by giving reassurance and moral support with the minimum amount of drugs. If drugs are really required, their safety should be evaluated and the duration should be limited to the shortest time possible.

Remember:
As much as possible, avoid giving drugs to a pregnant mother in the first 12 weeks of the pregnancy.

Drugs acting on the uterus are classified into two groups, namely uterine relaxants and uterine stimulants.

Uterine Relaxants
Uterine relaxants relax the uterine muscles at different stages of pregnancy. These are progesterogen and adrenoreceptor stimulants.

Progesterogen
These act in early pregnancy and are believed to make the uterus less irritable. They are sometimes used in the management of habitual or threatened abortion. As some of these agents cause masculinisation in female foetuses, they should be used with great caution. Never give these drugs yourself. Refer the patient to hospital.

Adrenoreceptor Stimulants
These include isoxsuprine, salbutamol (ventolin) and orciprenaline. They are used in late pregnancy to prevent premature labour as they have a direct relaxant effect on the uterine muscle. However, they also have strong cardiovascular effects and their use on a large scale can be dangerous.

Uterine Stimulants
These include prostaglandins, oxytocin and ergometrine.

Prostaglandins
These are a group of naturally occurring agents, which, depending on the circumstances, can either contract or relax smooth muscle. They are produced by the seminal vesicles. Other sites of origin are the adrenals, kidney, liver, gut and nervous tissue.
Certain types of prostaglandins cause vigorous uterine contractions at any stage of pregnancy. They can be used to induce an abortion or to induce labour. They can be administered intravenously, orally, as vaginal pellets, or as an intrauterine injection. At present they are very expensive

Oxytocin
This is produced by the posterior lobe of the pituitary gland. Syntocinon (pitocin) is a synthetic drug similar to oxytocin. Its dosage is expressed in units and it is usually given by an intravenous infusion so that its effects can be quickly discontinued if necessary. It is occasionally administered as a tablet (buccal pitocin). Syntocinon produces rhythmic contractions of the uterus with a relaxation phase in between, thus mimicking normal uterine activity in labour.
Its uses include:

- Induction of labour
- Sometimes treatment of uterine inertia
- Management of some cases of postpartum haemorrhage
- Management of inevitable abortions
- Evacuation of molar pregnancy

Dangers of oxytocin include foetal hypoxia and perinatal death as well as rupture of uterus.

Ergometrine
This is one of the ergot alkaloids, a naturally occurring group of substances prepared from a fungus. These substances have the ability to cause strong contractions of smooth muscle, including the uterine muscle. This will be covered further on the next page.
Unlike other ergot alkaloids, Ergometrine acts almost solely on the uterus. It produces a sustained tonic contraction of the uterus and its effects wear off after two to four hours. It is therefore unsuitable for inducing labour where slow, regular contractions with a good relaxation phase, like those produced by oxytocin are needed.
Ergometrine is the most important drug used to treat or prevent post partum haemorrhage. This is because of its ability to produce a sustained contraction, which shortens the muscle fibres so

as to prevent bleeding from the placental site. When given intravenously it acts in 45 seconds, but when given intramuscularly, it has the disadvantage of being slow to act (seven minutes).
However, as pitocin acts more rapidly when given by intramuscular route (two minutes), the two drugs are usually given as a combination known as syntometrine which is five units of syntocinon combined with 0.5mg of ergometrine. Syntometrine acts within two to three minutes when given intramuscularly.
Ergometrine can also cause peripheral vasoconstriction, hence the patient's blood pressure can increase after an injection of ergometrine, particularly after an intravenous injection.
To avoid toxic effects, 1.5mg is the maximum total dose of ergometrine maleate that can be given safely in 24 hours.

Remember:
Ergometrine should be avoided in cases of moderate or severe hypertension UNLESS there is postpartum haemorrhage.

SECTION 2: RISK FACTORS IN PREGNANCY

Introduction

In the previous section you looked at the management of normal pregnancy and the management of minor disorders caused by pregnancy. In this section you will look at the high risk factors in pregnancy including the medical conditions that affect pregnancy. The types of women in this group are those who are at higher risk of having complications either during pregnancy or labour. This may be because in their past deliveries they had problems like postpartum haemorrhage, which are likely to recur, or they have chronic diseases such as diabetes which are likely to get worse with pregnancy.
There are also those who are at risk in this particular pregnancy because of a problem such as severe anaemia, which has just developed. Note that these are the major causes of both maternal and foetal morbidity and mortality. Thus, early diagnosis and proper management is essential for a successful pregnancy and delivery.

Objectives

By the end of this section you will be able to:

- Manage mothers with risk factors/conditions in pregnancy
- Detect mothers with medical conditions during pregnancy

Risk Factors/Conditions in Pregnancy

You will start with some of the more common conditions during pregnancy that may cause risk to the pregnant woman and/or the foetus.

Hyperemesis Gravidarum

This is a condition where vomiting is severe and continuous throughout the day. The woman vomits everything she has eaten. This usually leads to severe dehydration and ketoacidosis. She becomes malnourished. If treatment is not started quickly, liver and kidney damage may result. Anaemia may develop as a result of lack of vitamin B, folic acid and iron.

Can you think of three conditions that are associated with hyperemesis gravidarum?

Did you think of these?
Hyperemesis gravidarum occurs in very few women. It is usually associated with multiple pregnancies, hydatidiform mole and/or a history of habitual abortions.

Management of Hyperemesis Gravidarum
If in a health centre or dispensary, the patient should be referred to a hospital as soon as the diagnosis is made. In the hospital, the following should be done:

- Intravenous infusion of five percent dextrose alternating with normal saline will be given to correct the dehydration.
- Anti emetics like promethazine hydrochloride (phenergan) or metoclopromide hydrochloride (plasil) are given usually parenterally to control the vomiting.
- Multivitamin supplements are given.
- The patient is reassured and her visitors restricted.
- Routine nursing care and observations of vital signs are maintained twice daily or as necessary.

The patient should be discharged at least two to three days after vomiting has ceased. The case should be followed up in the antenatal clinic.

Polyhydramnios

This is a condition in which the quantity of amniotic fluid exceeds 1500mls. It may not become apparent until it reaches 3000mls. It is a fairly rare condition.
Polyhydramnios is associated with the following conditions:

- Oesophageal atresia
- Open neural tube defect
- Multiple pregnancy, especially in monozygotic twins
- Maternal diabetes mellitus
- Rarely in rhesus isoimmunisation
- Severe foetal abnormalities

There are two types of polyhydramnios: chronic and acute.

Chronic Polyhydramnios

This occurs gradually, usually from about the 30th week of pregnancy.
It is the most common type.

Acute Polyhydramnios

This is a rare type, which occurs at about 20 weeks and comes on very suddenly. The uterus reaches the xiphisternum in about three to four days. It is associated with monozygotic twins or severe foetal abnormality.
Polyhydramnios can be recognised in the following ways:

- The mother may complain of breathlessness and discomfort.
- If the condition is acute in onset, she may complain of severe abdominal pain.
- The condition may aggravate other symptoms associated with pregnancy such as indigestion, heartburn, constipation, oedema, varicose veins of the vulva and lower limbs.
- On abdominal inspection, the uterus is larger than expected for the period of gestation and is globular in shape. The abdominal skin appears stretched and tight with marked striae gravidurum and marked superficial blood vessels.
- On palpation, the uterus is tense and it is difficult to feel foetal parts.
- The abdominal girth is much more than expected for the period of gestation.
- Auscultation of the foetal heart is difficult because of the free movement of the foetus.
- Where possible an ultrasonic scan should be done to confirm the diagnosis. It may also reveal multiple pregnancy or foetal abnormality if these are present

Management of Polyhydramnios

The mother is admitted to hospital and, where possible, the cause of the condition is determined. The subsequent care will be determined by the condition of the mother, the cause and the period of gestation.
If there is foetal abnormality, the method and timing of delivery will depend on the severity. If there is gross abnormality, induction should be started. The nursing care should include rest in bed in sitting position to relieve dyspnoea. Assist the patient with personal hygiene and routine prenatal observations.
If abdominal discomfort is severe, abdominal amniocentesis may be considered. If it is done, infection prevention measures must be observed and only 500ml should be withdrawn at a time. Labour may be induced in the case of late pregnancy. Before the membranes are ruptured, the lie must be determined and the membranes ruptured cautiously allowing the fluid to flow slowly. This is to avoid cord prolapse, alteration of the lie and abruptio placenta which may occur after sudden reduction of uterine size.

Complications of Polyhydramnios

There are several complications associated with polyhydramnios. These include:

- Increased foetal mobility leading to unstable lie and malpresentation
- Cord presentation and cord prolapse
- Premature rupture of the membranes
- Placenta abruptio when the membranes rupture
- Premature labour
- Postpartum haemorrhage

Oligohydramnios

In this condition there is an abnormally small amount of amniotic fluid. It may be 300 to 500ml at term but amounts vary and it may be much less. It is associated with absence of kidneys or

Potter's syndrome in which the foetus has pulmonary hypoplasia.
The lack of amniotic fluid reduces intrauterine space and causes deformities of the foetus due to compression. The baby's skin is dry and leathery in appearance and the nose may be flat. It may have talipes and a squashed-looking face.
The following characteristics will help you recognise the presence of oligohydramnios:

- The uterus is smaller than expected for the period of gestation
- The mother notices reduced foetal movements if she has had a previous normal pregnancy
- On palpation the foetal parts are easily felt and the uterus is small and compact

Management
The woman should be admitted for investigations, usually in the form of an ultrasound scan. If there are no foetal abnormalities, the pregnancy will be allowed to continue. Labour may be induced early to avoid placental insufficiency.
Analgesics are given during labour because the contractions are usually very painful. However, be aware that impaired circulation may cause foetal hypoxia. After delivery the baby is examined carefully for abnormalities.

Bleeding in Late Pregnancy (Antepartum Haemorrhage

Bleeding in late pregnancy refers to any bleeding from the genital tract from the 28th week of gestation and before the birth of the baby. It is usually known as antepartum haemorrhage.

Remember:
Never perform a vaginal examination on a woman with antepartum haemorrhage. This may lead to severe bleeding which can be fatal.

The two most important causes of bleeding in late pregnancy are placenta praevia and abruptio placentae. You will now look at each of these separately.

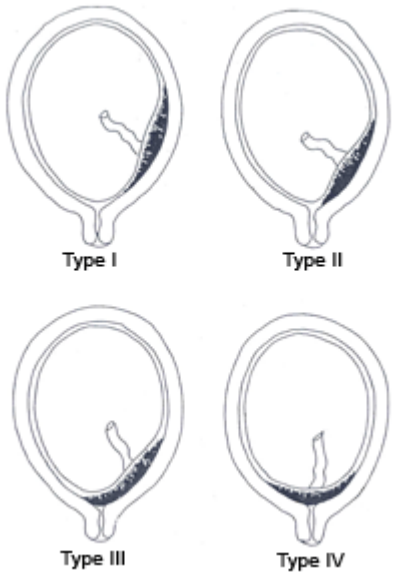
Placenta Praevia
This is bleeding from a partially separated placenta, which is wholly or partially situated in the lower uterine segment. It might be covering either part or the entire internal os.
It is more likely to occur with increasing maternal age. It is more common in women aged 35 and above. It is also associated with increasing parity, and is twice as common in multigravida as in primigravida.
Placenta praevia is divided into four types or degrees.

Type 1
The placenta lies in the upper segment and only the lower margin dips into the lower uterine segment.

Type II
The placenta is partially situated in the lower uterine segment with the lower margin of the placenta reaching the edge of the internal os but does not cover it. It is known as marginal placenta praevia.

Type III
The placenta covers the internal os when closed up to three to four centimetres dilatation. This is known as partial or incomplete placenta praevia.

Type IV
The placenta lies centrally over the internal os and covers the os even when the cervix is fully dilated.



Signs and Symptoms of Placenta Praevia

The signs and symptoms of placenta praevia include painless vaginal bleeding which starts when at rest or sleeping. It starts suddenly, usually from the 32nd week of gestation because of Braxton Hicks contractions.

Additionally, because the placenta occupies the lower uterine segment, the foetal head remains high, which results in malpresentation and unstable lie. If bleeding is severe, the blood pressure is low, the pulse and respirations are high, and there is shock corresponding with the amount of bleeding.

The Management of Placenta Praevia

If in a health centre or dispensary, refer all pregnant women with vaginal bleeding to hospital. Ensure there is a running intravenous drip of saline or dextrose before transferring the patient to the hospital. A nurse should always accompany the patient to the hospital.

In the hospital the type of management will depend on the amount of blood loss, the condition of the mother and foetus, the location of the placenta and the gestation period.

The aim of management is to control haemorrhage and to try to conserve the pregnancy up to 38 weeks gestation when the foetus is mature.

Where there is slight vaginal bleeding, conservative treatment is started if the pregnancy has not reached 38 weeks of gestation. The patient is admitted for complete bed rest and total care.

Measures to be Taken in the Case of Placenta Praevia

- Blood is taken for HB, grouping and cross matching
- She is put on mild sedation like phenobarbitone
- No abdominal palpation is done as it may trigger severe bleeding
- Save all pads to assess blood loss
- Give high protein diet
- Take two hourly vital signs
- On the third day speculum examination is done to exclude incidental haemorrhage
- At 34 weeks scanning is carried out to assess progress and to confirm diagnosis
- The patient should be retained in hospital until the 37th week when Examination Under Anaesthesia (EUA) is done in theatre ready for caesarean section in case of severe bleeding
- In placenta praevia type one and two and if placenta is anterior, the membranes are ruptured and spontaneous delivery awaited. Labour is induced with oxytocin drug
- In placenta praevia type two with placenta posteriorly situated and in type three and four, caesarean section is performed

In the case of moderate to severe vaginal bleeding, you should set up intravenous infusion and prepare for immediate caesarean section. Blood for HB grouping and cross matching should be taken, and physical and psychological preparation of the mother is done.

Complications of Placenta Praevia

The following are some complications of placenta praevia:

- Post partum haemorrhage
- Foetal hypoxia
- Puerperal sepsis
- Anaemia
- Maternal and foetal death

Abruptio Placentae (Accidental Haemorrhage)

This is bleeding from premature separation of a normally situated placenta occurring after the 28th week of gestation. It is associated with the following conditions:

- Hypertensive conditions and pre-eclampsia
- High parity
- Trauma
- Sudden release of polyhydramnious
- High fever
- Traction of abnormally short umbilical cord during labour
- External cephalic version
- Fright or sudden shock, for example, bad news

Types of Abruptio Placentae
There are three clinical presentations.

Mixed or combined, where bleeding is partly revealed and partly concealed.

Concealed, where the blood is trapped between the placenta, membranes and the uterine wall. There is no visible bleeding.

External or revealed, which is where there is free (visible) vaginal haemorrhage.

Signs and Symptoms of Abruptio Placentae
In the revealed type, there is slight to severe vaginal bleeding. On abdominal palpation there may or may not be pain and tenderness. The pulse is raised and there is low blood pressure or hypertension.
In the concealed type, there is severe abdominal pain and the patient is in shock. There is no vaginal bleeding and the uterus is very tender and is board like. The foetal parts cannot be palpated and there are no foetal heart sounds. The pulse is raised and there may be oliguria and proteinuria.
In the combined type, the patient has both features of revealed and concealed bleeding. The degree of shock is higher than the visible blood loss. The uterus is tender and rigid and pain is constant.

Management of Abruptio Placentae
Refer the patient to hospital if in a health centre or dispensary. She should be started on intravenous drip. Inform the hospital if possible. Take a specimen of blood for grouping cross matching before starting the drip and take it with the patient when she is transferred. In the hospital, admit the patient and call the doctor immediately. Give emotional support and physical care. Relieve pain with IM morphine 15mg or pethidine 100mg. If there is severe bleeding treat for shock and prepare for caesarean section.
Take vital signs, such as blood pressure and pulse, quarter to half hourly and temperature four hourly. Raise the foot of the bed to prevent vena cava occlusion by gravid uterus. Maintain a urine output chart and test urine for protein. You should also test blood for coagulation defects and take clotting time at intervals for monitoring. Prepare for reception and resuscitation of the baby. Usually, the baby is still born. A blood transfusion should be given where necessary.

Conservative Management
This occurs in cases of mild separation of the placenta. When the mother and baby are in good condition, intra-uterine scanning is done to assess the degree of haemorrhage and continuous foetal monitoring is done to assess foetal condition.
If both mother and baby are well and gestation is under 37 weeks, she may be discharged and seen weekly at the antenatal clinic.
At 37 weeks gestation you should readmit the mother for induction. The membranes should be ruptured and she should be started on oxytocin drip and monitored half hourly for onset of labour. In case of foetal distress, Caesarean section should be performed.

Complications of Abruptio Placentae
These can be very serious and include the following:

- Failure of blood clotting mechanisms, leading to excessive haemorrhage in concealed bleeding
- Renal failure or hypovoleamia
- Puerperal sepsis
- Anaemia
- Maternal death
- Foetal death
- Anterior pituitary gland necrosis. Thrombosis of pituitary gland may occur in severe bleeding and if the mother stays in shock for long

Other causes of antepartum haemorrhage include:

- Rupture of small vessels at the edge of the placenta
- Cervical erosion
- Cancer of cervix
- Severe cervicitis
- Infected cervical polyp

For any of these conditions, refer the patient to the hospital for management. You will learn their specific management in unit three.

The Differences between Placenta Praevia and Abruptio Placentae

Placenta Praevia	Abruptio Placentae
1. Painless vaginal bleeding	1. Painful vaginal bleeding
2. Recurrent bleeding	2. Non recurrent bleeding
3. The blood lost is bright red	3. The blood lost is dark red
4. The amount of blood lost is in keeping with the general condition of the patient	4.The amount of blood lost may be very little compared with the subsequent shock and/or anaemia
5. No signs of pre-eclampsia	5. Signs of pre-eclampsia may be present
6. The foetus is most often alive	6. The foetus is dead in most cases
7. The uterus is soft and not tender	7. The uterus is tender and may be hard
8. The foetal parts are easily palpable	8. The foetal parts may be difficult to palpate
9. The uterine size corresponds to dates of gestation	9. The uterus may be larger than dates of gestation
10. The presenting part may be displaced into the iliac fossa	10. The presenting part is usually in the normal place

Pre-eclampsia

Can you think of five conditions that may predispose a mother to pre-eclampsia?

Pre-eclampsia is a condition peculiar to pregnancy and occurring usually after the 28th week of gestation. It is characterised by the presence of hypertension, oedema and proteinuria or any two of the three. It is more common in the following conditions:

- Primigravida, especially the too young or over 35 years
- Multiple pregnancy
- Diabetes mellitus
- Hydatidiform mole
- Essential hypertension
- Polyhydramnios
- Mothers with past history of pre-eclampsia
- Obese mothers

As you can see, it is important to take a good history as it will enable you to detect this condition early.

The cause of pre-eclampsia is not known, but there are various theories relating to its possible causes, which are endocrine in nature, metabolic or immunological.

Diagnosis of Pre-eclampsia

The diagnosis of pre-eclampsia is not easy since the mother has no obvious complaints. There are three cardinal signs.

Hypertension

There is a rise in diastolic pressure of 15 to 20mm/hg above the mother's normal diastolic pressure, or an increase above 80 to 90mm/hg on two occasions. A marked increase in systolic pressure above that expected for the mother's age is important to note, for example, 140 to170 where the mother's normal pressure is between 90/60 and 120/70mm/hg.

Proteinuria

This is important in the absence of urinary tract infection. It may be detected in testing a midstream specimen of urine, which should be followed by laboratory investigation. The amount of protein in the urine indicates the severity of pre-eclampsia.

Oedema

Oedema of ankles is common in late pregnancy but it disappears overnight. This is known as physiological oedema. Any generalised oedema is significant and occult oedema is suspected in cases of excess weight gain above what is expected for the gestation. Clinical oedema may be mild or severe. The oedema puts on pressure and is found in the following areas:

Feet, ankles, and pretibial region; lower abdomen; vulva, which is uncomfortable and distressing to the mother; sacral area in a mother confined to bed; facial puffiness of the face and eye lids, fingers.

Pre-eclampsia can be classified as mild, moderate or severe.

Mild Pre-eclampsia
This is detected when, after resting, the diastolic pressure is 15 to 20mm/hg above the basal blood pressure recorded in early pregnancy or a diastolic above 80 to 90mm/hg, for example, BP 130/80 to 140/90. Oedema of feet, ankles and pretibial region may also be present.

Moderate Pre-eclampsia
This is diagnosed when there is marked rise in both systolic and diastolic pressure - 140/100 to 160/100mm/hg, proteinuria of 0.5gm/litre with no evidence of urinary tract infection and generalised oedema.

Severe Pre-eclampsia
Symptoms include the blood pressure exceeding 160/110mm/hg and an increased proteinuria over 1gm/litre. There may be marked generalised oedema, frontal headache and visual disturbances.
The effects of severe pre-eclampsia on the mother include:

- Abruptio placenta
- Condition may worsen, leading to eclampsia
- The kidneys, lungs, heart and liver may be seriously damaged due to haematological disturbance
- The capillaries within the fundus of the eye may be irreparably damaged causing blindness

The effects on the foetus are:

- Low birth weight due to reduced placental function
- Increased incidence of hypoxia during prenatal and intranatal periods
- Placenta abruptio leading to hypoxia and later death
- Prematurity if the baby is delivered early delivery due to placenta abruptio or worsening of the condition

The midwife plays an important role in detecting pre-eclampsia. There should always be vigilant antenatal care to enable early detection and management.
You should also ensure a thorough history taking to detect the mothers at risk early in pregnancy.
Follow up should include monitoring of weight and blood pressure and urine testing on every subsequent visit.
Factors that may predispose the patient to pre-eclampsia, such as multiple pregnancies and obesity should be noted early.

Management of Pre-eclampsia
The method of management will depend on the severity of the condition. The main principles of care are:

- Provide adequate rest and monitoring of observations to avoid eclampsia
- Prolong the pregnancy until the baby is mature enough to survive
- Safeguard the life of the mother

Mild Pre-eclampsia Management
The mother should be advised on bed rest at home and she is seen weekly to assess her condition. She should be given anti-hypertensive drugs such as aldomet 500mg. Sedatives such as valium or phenobarbitone should also be administered to help her rest and she should be advised to report to the hospital in case of any problem.

Moderate Pre-eclampsia Management
The patient should be admitted to hospital for bed rest. She should only be allowed to go to the toilet. She should be nursed in sitting position or lying on the side to encourage uterine blood flow. Bed rest will reduce oedema by improving the renal circulation, facilitating kidney filtration and producing diuresis. It also lowers the blood pressure.
The patient's diet should be rich in protein, fibre and vitamins and low in carbohydrates and salt. Her weight should be recorded twice a week. Observe for oedema daily. Urine should be tested for protein and Ketones. Esbach setting is done daily to assess level of protein loss. Twenty four hour urine collection should be done to estimate oestriol level as an indication of placental function.
Fluid intake and output should be maintained strictly to monitor renal function.
Sedatives, such as phenobarbitone, may be given to ensure rest and sleep. Give antihypertensive drugs like aldomet to lower blood pressure. Take vital signs: blood pressure, temperature, pulse and respirations four hourly.
The foetal heart rate should be taken four hourly or two times daily, depending on the condition. A kick chart to monitor foetal movement should also be kept.
When the mother's condition improves, she can be discharged to attend clinic weekly until she goes into spontaneous labour. Otherwise, she

should be admitted at 38 weeks for induction of labour. If, in spite of the above care, the condition does not improve, caesarean section should be performed.

Management of Labour

Remain with the mother throughout labour. Maintain close vigilant observations of:

- Presence of oedema
- Urinary output
- Urinalysis results
- Blood pressure

Report any deviations to the doctor immediately. Take vital signs as follows: blood pressure and pulse rate half hourly, temperature four hourly, unless otherwise indicated.

Perform abdominal examination and observe for contractions and foetal heart rate half hourly. At the same time, observe for signs of second stage of labour and immediately alert both the obstetrician and paediatrician.

After delivery, monitor blood pressure four hourly for 24 hours. Urinalysis should be done twice a day. You should maintain a urinary output chart and continue with antihypertensive drugs and normal postnatal or caesarean section care.

Active Management of Severe Pre-eclampsia

Admit the mother in a quiet, dimly lit room on complete bedrest. In the room there should be an emergency tray and an epileptic tray in case of a fit. The aim of care is to prevent convulsions and control hypertension to prevent death of the mother and foetus.

Place the mother on lateral position to improve foetal circulation and to prevent vena cavae compression by the uterus. Remain with the mother and maintain vigilant observations. On admission you should take all observations and note them on a chart and continue half hourly or as prescribed by the doctor.

The doctor will prescribe antihypertensive drugs like hydrolysing 5-10mg which is administered slowly and blood pressure monitored every five minutes until it stabilises. Diazepam is also given 10mg stat followed by 40mg in 5% dextrose. Lasix 20 to 80mg may be given as a diuretic. Antibiotics may be prescribed if necessary. Strict monitoring of blood pressure should be done.

Maintain a strict intake and output chart and test all urine that is passed. In some cases an indwelling catheter may be passed. Fluid intake is restricted to one to two litres in 24 hours. Esbach should be set daily. The weight should also be measured daily or on alternative days.

Administer medication as prescribed. Observe for signs of onset of labour and signs of impending eclampsia. If protenuria and high blood pressure persist, the doctor should induce labour by artificial rupture of membranes followed by syntocinon drip. Unless there is some obstetric contra-indication a caesarean section will be done.

You have seen that mothers with severe pre-eclampsia can proceed to eclampsia. The following are warning signs of impending eclampsia:

- A sharp rise in blood pressure
- Diminished urinary output
- Increased proteinuria
- Severe persistent frontal occipital headache
- Drowsiness or confusion (due to cerebral oedema)
- Blurring of vision or flashing lights (due to retinal oedema)
- Nausea and vomiting
- Epigastric pain which the mother may interpret as indigestion (due to oedema of the liver)

Should a mother present to your clinic with these signs, give her an anticonvulsant and refer to hospital immediately for further management. In the hospital, the midwife should summon the doctor immediately.

Care During Labour

Treatment for severe pre-eclampsia should be continued. Perform a vaginal examination to assess the progress of labour. During the second stage, episiotomy should be performed to shorten the phase and the doctor will use vacuum extractor to prevent the mother from pushing. Ergometrine is avoided because of its vaso-constrictive effect and instead syntocinon 5 IV in a drip or intramuscularly is given. A Caesarean section may be performed if the condition does not improve or there is obstetric contra-indication for vaginal delivery.

Post Delivery Care for Pre-eclampsia Cases

Sedate the mother and continue observations of vital signs. Continue and adjust drugs as necessary.

Eclampsia

Eclampsia is an acute condition characterised by convulsions and coma. The incidence of

eclampsia is 0.2 to 0.5% of all pregnancies. It can occur in the antenatal period at the rate of about 20%; during the intrapartum period at the rate of about 25% and during the postnatal period within the first few hours after delivery (35%).

Signs and Symptoms of Eclampsia
The prodromal signs of eclampsia are those we have described as serious signs of pre-eclampsia. The more immediate precursors of eclampsia are vomiting, intense headache and epigastric pain.
There are four stages of an eclampsia fit.

Premonitory stage, which lasts 10 to 20 seconds. The mother is restless and rapid eye movements can be noted. The head may be drawn to one side, twitching of the facial muscles may occur, and the mother is not aware of what is happening.

The **tonic stage** lasts 10 to 20 seconds. The muscles of the mother's body go into spasms and become rigid. The back may become arched and her teeth become tightly clenched. The eyes appear like they are staring and her diaphragm goes into spasm. Respirations cease and cyanosis occurs.

The **chronic stage** lasts 60 to 90 seconds. There is violent contraction and intermitted relaxation of the mother's muscles causing convulsive movements. There is increased salivation and foaming at the mouth.
The mother's face becomes congested and bloated while her features become distorted. The mother becomes unconscious and breathing is stertorous while the pulse full and bounding. The convulsions subside gradually.
In the stage of **coma** stertorous breathing continues and the coma may persist for minutes or hours. Further convulsions may occur before the mother regains consciousness.
Now move on to look at the management of eclampsia

Management of Eclampsia
The main principle of management is to stop convulsions and deliver the pregnant woman by the quickest and safest method. The mother's welfare is of paramount importance and the foetus is the secondary consideration as it is already in great danger.

Steps taken at the health centre
- Stop convulsions by giving intravenous diazepam or phenobarbitone or paraldehyde.

- Insert a mouth gag to prevent the mother from biting her tongue.

- Place the mother in semi-prone position to facilitate drainage of saliva and vomitus.

- Aspirate to remove mucus and to maintain clear airway and administer oxygen as necessary.

- Transfer the patient to hospital by quickest means and accompany her.

- Take a delivery and emergency tray with drugs and mucus extractor, the patient's notes and records.

- Inform the hospital before you leave.

Steps taken in the hospital
- Call the doctor and, meanwhile, put up intravenous drip of 5% dextrose for nutrition and drugs.

- IV diazepam 10mg is given followed by 40mg in 5% dextrose 500ml IV drip at 60 drops/minute.

- IV hydralazine 10mg is given to reduce the blood pressure. It should be given slowly and blood pressure checked every five minutes.

- The doctors will perform careful assessment to determine the method of delivery. Vaginal delivery is preferred unless there is contra-indication.
- Once the blood pressure is under control, labour is induced by artificial rupture of membranes and syntocinon drip commenced.

- Insert a urethral catheter and maintain continuous urine drainage.

- If vaginal delivery is not possible she is delivered by caesarean section.

The patient should be nursed in a darkened, quiet room. At this point you should take the following steps:

- Take observations of vital signs and uterine contractions half hourly.

- Protect from injury from the cot sides and nurse in semi-prone position to encourage saliva and mucus drainage.
- Do not restrict convulsive movements.
- Ensure catheter care and keep the airway clear.
- Prepare for delivery or caesarean section as appropriate.

After a fit continue oxygen therapy and, do not give oral fluids. Intravenous fluids should be restricted to 2000ml in 24 hours. Maintain strict fluid intake and output chart. Observe for signs of labour. Delivery is by vacuum extraction and sedation is continued. The baby should be nursed in the special care baby unit (nursery).

Complications that may arise

- Cerebral haemorrhage
- Mental confusion
- Thrombosis
- Acute renal failure
- Liver necrosis
- Many develop myocardial infarction due to pulmonary oedema
- Bronchopneumonia
- Temporary blindness
- Injuries or fractures may result if the patient falls or movement is restricted during a fit
- She may bite her tongue
- Foetal hypoxia, prematurity, still birth

Medical Conditions that may Complicate a Pregnancy

There are several medical conditions that may complicate a pregnancy. These include:

- Cardiac disease
- Anaemia
- Diabetes
- Malaria
- Tuberculosis
- Urinary Tract Infections

You will now cover these in more detail.

Cardiac Disease in Pregnancy

There are changes that occur in the cardiac system during pregnancy due to the increased demand in the foeto-placental unit. These changes increase the workload of the heart. The major changes are:

- Blood volume increases by 35%
- Cardiac output increases by 40%, that is from 4.5 to 6l/min

The extra work that the heart has to do is reduced by the decreased blood viscosity and lowered peripheral resistance. The pulse rate rises slightly in order to pump out the extra blood around the body. Oxygen consumption is raised. The heart is displaced upwards during the last trimester by the gravid uterus. During the third stage of labour 300 to 400ml of blood is added to the circulating volume by the contracting uterus.

These changes commence in early pregnancy and gradually reach their maximum at the 30th week and are maintained until term.

Risk Factors for Heart Disease

The following factors predispose patients to heart disease:

- Anaemia, which should be avoided and if present, vigorously treated.
- Infections, the most common of which are upper respiratory infections. These should be treated with antibiotics.
- Obesity should be avoided. Controlled weight gain should be encouraged to avoid extra strain on the heart.
- Hypertension and pre-eclampsia should be admitted and controlled.
- Smoking mothers should be advised to control their habits.
- Multiple pregnancies should be well monitored.
- Strain of any form should be avoided and mothers should be encouraged to have enough rest and adequate sleep.
- Exercises that induce breathlessness should be discouraged.
- Fatigue of any kind should be avoided.

Cardiac disease in pregnancy has been classified in four grades. These are:

Cardiac Grade I

In this grade, there are no symptoms but a heart murmur is discovered on general examination.

Cardiac Grade II

There are symptoms during ordinary physical

activity (breathlessness) but no symptoms when at rest.

Cardiac Grade III

There are symptoms during mild physical activity. The mother is unable to perform ordinary daily activity. On slight exertion she gets exhausted and severely dyspnoeic and has anginal pain.

Cardiac Grade IV

There are symptoms even at rest. There are signs of cardiac disease and heart failure.
Effects of cardiac disease in pregnancy

- The increase in blood volume and body weight causes strain on the already impaired heart.
- The increased cardiac output reaches maximum at 30 weeks when the output is 25% above normal and, therefore, there is greater need for rest.
- The normal venous dilation, which accompanies pregnancy, slows the venous return to the heart and, therefore, increases the difficulty in maintaining adequate output.

This results in an increased risk of thromboemboli and bacterial endocarditis and raised maternal mortality when blood flow is impaired. There also also risks to the foetus and these include intrauterine growth retardation, raised incidence of congenital heart disease, and raised risk of foetal loss.

Management of Heart Disease
The mother is followed up by obstetrician, cardiologist, haematologist and anaesthetist for effective management. The main aim of management is to maintain and improve the physical and psychological well being of both the mother and the foetus and to prevent complications.
Prenatal management for mild cardiac disease (Grades I & II) should include:

- Good history taking and a careful examination of the mother should be done on the first visit.
- The mother is seen fortnightly until 32 weeks, then weekly until term. Ideally, she should be admitted between 29 to 32 weeks for rest.
- All infections should be prevented and, if present, treated promptly.
- Anaemia should be treated effectively and prevented by extra iron HB. Therefore, check regularly for anaemia.
- Health messages on the importance of a balanced diet, avoiding excess weight, adequate rest and sleep, need for house help, and the effects of smoking, should be shared.
- Tooth extraction is possible under antibiotic cover but should be discouraged.
- Drugs like digoxin, diuretics such as lasix to reduce oedema, and sedatives may be taken as prescribed.
- At 38 weeks gestation, the patient should be admitted for complete bed rest.

Management of Heart Disease (Grades I and II)
In **first stage** labour, follow normal admission procedure. You should:

- Inform the obstetrician and the cardiologist
- Vigilant observations quarter to half hourly, especially of pulse, respirations, colour and foetal heart rate
- Administer prophylactic antibiotics
- Mild sedation

In the **second stage** of labour the following steps should be taken:

- The patient should avoid exhaustion
- Paediatrician to be around
- The mother should be placed in the dorsal position or the position in which she feels most comfortable
- Episiotomy and vacuum extraction may be performed

In the **third stage** of labour:

- No ergometrine should be given
- The cord should be delivered by controlled
  cord traction

During the **puerperium**, the following measures should be taken:

- The patient may need to rest and may require sedatives
- Keep her under strict observation half hourly until stable then two to four hourly
- Treat any infections promptly
- If there are no complications, discharge on the tenth day post delivery

Management of Heart Disease (Grade III and IV)

When managing a patient with severe cardiac disease, the following steps should be taken in the prenatal stage.

The patient should be nursed as a cardiac failure patient. She should be admitted on first contact for complete bed rest. The strain is greatest between the 23rd and 32nd weeks and so total nursing care should be given during that period. There should always be two nurses present to perform any procedure.

A very sick mother should be nursed in the propped up position and preferably in a cardiac bed. You should monitor foetal heart and foetal placental blood flow. Administer a diet low in salt and ensure adequate rest, through the use of sedatives if necessary. Maintain good hygiene. Administer drugs as prescribed by the doctor and treat anaemia. Ensure that there is social care and support by family members and social workers.

In terms of psychological care, it is very important to reassure the patient about her condition. Attend to her emotional needs and give counselling on reproductive health.

Intrapartum management usually involves an easy delivery due to hypoxia. Take the following measures:

- Avoid exhaustion
- Prop up in bed to prevent orthopnoea
- Give oxygen continuously
- Give analgesics but avoid inhalation
- Observations should be taken quarter hourly

In the second stage, avoid pushing and give episiotomy and vacuum extraction. No ergometrine should be administered. If there is any post partum haemorrhage, give syntometrine.

Puerperium management involves nursing in Intensive Care Unit (ICU) for 48 hours. You should take the following steps:

- Ensure that the patient has complete bed rest and total nursing care
- Observations half hourly until stable, then four hourly
- Withhold breast feeding if mother is in heart failure
- Admit the baby in a special care unit

Remember:

Carry out a thorough first examination to rule out congenital heart condition. Continue antibiotics and sedatives for two weeks. Discharge when condition is satisfactory.

Always keep in mind the following complications, which may arise:

- Congestive cardiac failure
- Pulmonary oedema
- Cardiac arrest
- Puerperal sepsis as a result of lowered resistance to infection
- Deep venous thrombosis, pulmonary embolus, which may lead to death
- Postpartum haemorrhage due to anaemia
- Bacterial endocarditis
- Myocardial infarction

Acute Heart Failure

The following are signs of acute heart failure:

- Cyanosis
- Rapid irregular pulse rate
- Cold sweating extremities
- Cough with blood (haemoptysis)
- Pulmonary oedema, which is sudden with tachycardia, intense dyspnoea, bronchospasm, cough, frothy mucus

The mother is nursed propped up in bed. Her diet should be low in salt. Restrict fluid intake and maintain fluid intake and output chart strictly. Rehydrate slowly. The patient should be kept warm and she should avoid exertion. Exercises, such as passive leg movements should be encouraged.

Observe the vital signs quarter hourly, report severe breathlessness, cyanosis, raised pulse rate above 110 per minute and respiration above 24 per minute.

Management of Labour for Acute Heart Disease Cases

First Stage

- Prop up in bed
- Valium 5 to 10mg in early labour to allay anxiety
- Morphia for pain
- Observations quarter hourly
- Rehydrate slowly

Second stage

- Usually short and easy
- Sit up or lie in the most comfortable position
- Give continuous oxygen
- No pushing
- Episiotomy is performed under pudendal nerve block
- No ergometrine
- Syntometrine is given only if Postpartum Haemorrhage (PPH) occurs

Third Stage

Patient may collapse when uterus contracts returning more blood into circulation thus overloading the heart. To avoid this, the right hand is placed on the abdomen firmly above the umbilicus to decrease abdominal pressure.

Discourage mother from over breathing because it draws more blood to the heart. If syntocinon is given, it should be continuous infusion with a syringe pump (10 to 20 units). Lasix should be given half hour before commencing the drip. This also applies if blood is to be transfused.

Puerperium

Heart failure may occur suddenly during puerperium, especially if the patient has incompetence of the aortic valve.

The patient should be nursed on complete bed rest. Ensure adequate breathing and leg exercises to prevent embolism. Ambulate on the fourth to fifth day. You should continue antibiotics for two weeks

Breastfeeding is encouraged unless there is actual heart failure.

The following family planning methods are advised:

- Natural family planning
- Barrier methods with spermicides
- Progesterone only pill

The mother will require adequate health information messages concerning contraceptives and her condition in order to make an informed choice.

Anaemia in Pregnancy

Anaemia is a deficiency in the quality or quantity of red blood cells with the result that the oxygen carrying capacity of the blood is reduced. The normal haemoglobin level in a female is 12 to 14gm per deciliter. Anaemia is diagnosed in pregnant women when the haemoglobin level is below 10gm per deciliter.

The following are some of the signs and symptoms of anaemia:

- Pallor of mucous membranes
- Breathlessness
- Dizziness
- Fatigue and lethargy
- Fainting attacks
- Headaches due to lack of sufficient oxygen to brain cells
- Anorexia and vomiting

Anaemia affects the patient in several ways. With regard to the mother, anaemia has the following effects:

- It reduces enjoyment of pregnancy due to fatigue
- It reduces resistance to infection caused by impaired cell mediated immunity
- Predisposition to postpartum haemorrhage
- Potential threat to life
- Problems caused by treatment and side effects like constipation

Anaemia also affects the foetus in the following ways:

- High perinatal mortality if maternal haemoglobin level is below 8gm/decilitre
- Increased risk of intra uterine hypoxia and growth retardation and severe asphyxia in severe anaemia
- Increased sudden infant death when maternal haemoglobin is below 10gm/decilitre

Degrees of Anaemia

These are classified according to the severity in pregnancy:

- Mild anaemia is when haemoglobin level is between 8.1gm/dl to 9.9gm/dl
- Moderate anaemia is when the haemoglobin level is between 5.1gm/dl to 8gm/dl
- Severe anaemia is when the haemoglobin is less than 5gm/dl

In severe anaemia there is:

- Renal hypoxia resulting in retention of sodium and electrolytes

- Myocardial hypoxia leading to heart failure
- Mental confusion
- Cough, especially with congestion in lungs

You will now look at the types of anaemia commonly seen in pregnancy.

Physiological Anaemia

During pregnancy the blood plasma volume increases by 15% by the 10th week of gestation and 50% by the 32nd to the 35th week of pregnancy.

The red cells mass increases by 30%. These result in increased cardiac output from five to seven litres per minute.

These changes result in apparent anaemia but as this represents the normal pregnancy state, they should not be regarded as pathological.

Iron Deficiency Anaemia

During pregnancy approximately 1400gm of iron is needed during the entire period. Please note that this is given in small doses of about 200gm three times a day. This is necessary for:

- The increased number of red blood cells
- The foetus and the placenta
- Replacement of blood lost during delivery
- Lactation

Remember:

Absorption of iron is usually hindered by tea or coffee consumption, thus ascorbic acid is given to hasten iron absorption if one cannot stop taking tea or coffee.

Folic Acid Deficiency Anaemia

Folic acid is required for the increased cell growth of both the mother and the foetus. The main causes of folic acid deficiency anaemia are:

- Low dietary intake
- Reduced absorption
- Interference with utilisation like in substance abuse, anti-convulsant drugs and sulphonamides which are folate antagonists
- Excessive demand and loss like in haemolytic anaemia

Management of Anaemia in Pregnancy

The management of a woman with anaemia depends on the type and severity of anaemia, and the duration of pregnancy.

Mild Anaemia

This is characterised by haemoglobin between 8.1 to 9.9gm/decilitre. At a gestation of 20 to 29 weeks, the woman is given heamatinics and a diet rich in protein and iron.

At 30 to 36 weeks, the haemoglobin levels are checked, diet is emphasised and haematinics continued. These include oral iron, for example, ferrous sulphate 200mg three times daily.

Investigations are carried out to establish the cause of the anaemia, for example, malarial parasites, hookworms, sickle cell disease. The mother is given health messages on nutrition, rest and taking drugs as prescribed.

Moderate Anaemia

This is characterised by haemoglobin levels of between 5.1 to 8gm per decilitre. At gestation of 29 to 30 weeks investigations are carried out to establish the cause and institute treatment.

Haematinics are given and a total dose of parenteral inferon 50 mgs/mililitre is given in a slow intravenous infusion of normal saline after a test dose to rule out sensitivity.

Intramuscular iron in the form of sorbital 50mg/ml is also administered. The dose is 1.5mg/kg body weight weekly. Haemoglobin levels are monitored regularly starting on the third day after commencement of treatment and then monthly. The injection should not be given in conjunction with oral iron as this enhances toxic effects.

At 30 to 36 weeks of gestation the woman is given total dose inferon and transfused with no more than 500ml whole blood. The blood is given slowly under close supervision. After transfusion, the woman will be put on folic acid. At 37 weeks blood transfusion is given again as above.

Parenteral iron is contraindicated for women who have liver or renal conditions.

Severe Anaemia

This is characterised by haemoglobin below 5gm per decilitre. This is an emergency where the mother is admitted and put on complete bed rest to reduce cardiac workload as she could go into cardiac failure.

Investigations are carried out to establish the cause. Meanwhile, she is nursed in left lateral position to prevent compression of the vena

cava by the gravid uterus. Vital observations are taken quarter hourly and the foetal heart rate is monitored.
Transfuse three units of packed cells slowly. Monitoring is continued quarter hourly. Administration of haematinics is continued.
In case of malaria, hookworm or sickle cell disease, the root cause of the anaemia is treated.
Health messages are shared on diet and general prevention.

Management During Labour
Blood is cross-matched and the patient is started on transfusion of packed cells only to avoid cardiac overload. Emergency drugs are kept ready. In the second stage of labour, oxygen is given and a vacuum extraction is carried out. Intravenous lasix is given. Syntocinon 40 to 60 units in half litre of 5% dextrose is given by pump.

Remember:
Ergometrine is contra-indicated because it causes vaso-constriction.

Blood loss should be minimised by rubbing the uterus to contract it. Controlled cord traction is used to deliver the placenta. The mother should avoid any exertion.

Post Natal Care
The mother is given antibiotics to prevent infection, and put on haematinics for three months. The haemoglobin is checked on the third and sixth week.
Family planning and good nutrition are encouraged.
If a pregnant woman has folic acid deficiency, you should give folic acid supplements and oral Iron. If she has vitamin B12 deficiency she should be given a weekly dose of 100mg of vitamin B12 injections until the condition is reversed.

Prevention of Anaemia in Pregnancy
The prevention of anaemia in pregnancy involves taking the following steps.

Health Education
You should advise mothers in the antenatal clinic about a balanced diet. Green vegetables should not be overcooked as this destroys the folic acid. Teach them about proper disposal of faeces to avoid hookworm infestation. Encourage the practice of child spacing to avoid frequent pregnancies so as to give the woman's body time to replenish her body stores. In addition encourage her to continue coming to antenatal clinic.

Prophylactic Medication
Give the following supplements to the women throughout pregnancy:

- Ferrous sulphate 200mg three times a day
- Folic acid 5mg daily
- Prophylactic anti malarial medication

Ensure early detection and adequate treatment of malaria, anaemia, antepartum and postpartum haemorrhage.

Diabetes in Pregnancy

Diabetes mellitus is not a new terminology and module one will be frequently referred to.
Diabetes is a metabolic disorder due to partial or total lack of insulin, characterised by hyperglycaemia. This may seriously complicate a pregnancy as you will see later on.

Primary Diabetes
Diabetes can be primary which involves abnormality of the pancreas and is sometimes called juvenile diabetes.

Secondary Diabetes
The other type of diabetes is known as secondary diabetes. It occurs later in life and could be due to a disease in the pancreas such as tumours or infection interfering with the normal production of insulin by the islets of Langerhan's. It can also first appear during pregnancy.

Classification of diabetes mellitus in pregnancy

Insulin Dependent Diabetes Mellitus is where the patient has abnormal blood sugar and is on insulin therapy to control the blood sugar levels.

Non Insulin Dependent Diabetes Mellitus is where the patient has abnormal blood sugar but it is controlled by diet alone.

Gestational Diabetes Mellitus is where the patient develops abnormal glucose during pregnancy.

Potential Diabetic is where the individual has an increased tendency to develop the disease during pregnancy, due to having delivered an unduly large baby (4.5kg or more), family history of diabetes, chronic obesity or glycosuria.

Carbohydrate Metabolism in Pregnancy
Do you remember the functions of insulin, digestion and metabolism of carbohydrate which was covered in module one?
To understand what happens during pregnancy you must know what happens normally.
If you need to do so, go back and review this section in module one.
There are a lot of changes, which occur due to pregnancy and some of these changes will be covered now.

Fall in fasting blood sugar
The foetus obtains glucose from its mother via the placenta by the process of diffusion. From the 10th week of pregnancy there is progressive fall in maternal fasting glucose from 4 to 3.6 mmol/l.

Ketoacidiosis
During the third trimester the mother begins to utilise fat stores laid down in the first and second trimester. This results in free fatty acids and glycerol in the blood stream and the woman becomes ketotic more easily.
Hormonal Effect
The foeto-placental unit alters the mother's carbohydrate metabolism to make glucose more readily available. Human Placental Lactogen hormone (HPL), manufactured by the placenta, causes resistance to insulin in the maternal tissues. The blood remains raised for a longer period than in the non-pregnant state.
The extra demands on the pancreatic beta cells can precipitate glucose intolerance or overt diabetes in those whose capacity for producing insulin was just adequate prior to pregnancy. If the mother was already diabetic before pregnancy, her insulin need will be further increased.

Glycosuria in Pregnancy
Glycosuria in pregnancy is not diagnostic of diabetes because there is:

- An increase in glomerular filtration rate as it passes through the proximal convoluted tubule faster than the re-absorption
- Lowered renal threshold to glucose for the diabetic, which leads to more glucose in the glomerular filtrate
- Renal tubular damage interferes with glucose re-absorption and may be revealed for the first time during pregnancy

You will now cover the different grades of diabetes.

Potential Diabetes
Potential diabetes is indicated by various criteria, for example, one or both parents are diabetic,
or the mother has previously borne an unduly large baby. Usually, there is marked chronic obesity and glycosuria.

Chemical
Chemical diabetes is characterised by abnormal Glucose Tolerance Test (GTT) but is without symptoms.

Overt or Clinical
This is indicated by abnormal GTT with symptoms and raised fasting blood glucose level.

The Effects of Pregnancy on Diabetes
When the mother has diabetes and then becomes pregnant, there will be further increase in insulin demand and even a mother who had only been on a controlled diet, without need for medication, may now require insulin supplements. This is due to low renal threshold to glucose and also low glucose intake by mother due to nausea and vomiting.
The mother easily gets ketoacidosis as the fat is broken down. In late pregnancy, insulin requirements are still high as there is reduced sensitivity of the tissues to due to the Human Placental Lactogen hormone. Those with juvenile diabetes may progress to nephropathy hence kidney failure and retinopathy leading to blindness.

The Effects of Diabetes on Pregnancy
It is important to know what happens to the mother and foetus in relation to glucose and insulin control and the effects.

Effects of Diabetes on the Mother
Unrecognised or a badly treated diabetes leads to complications in both the mother and the baby. If well controlled, then the effects to pregnancy may be minimal.

Maternal complications include:

- Urinary tract infection
- Candidiasis of vulva and vagina
- Reduced fertility, spontaneous abortion, pregnancy
  induced hypertension
- Hydramnios
- Pre-term labour

The foetal and neonatal complications occur when the blood sugar is not controlled and are mainly due to glucose being attached to the haemoglobin (glycosulated haemoglobin). This results into impaired oxygen carrying capacity resulting in the following conditions.

Macrosoma

Glucose crosses the placental barrier easily but insulin does not. Hyperglycaemia in the mother is reflected by foetal hyperglycaemia in late pregnancy. The foetal pancreas responds by producing excess insulin, which cannot cross back into the maternal circulation. The insulin converts excess glucose into glycogen, which is stored as fat deposits in the tissues resulting in a big baby.

Foetal Hypoxia

Intrauterine hypoxia is caused by vascular changes on the maternal side of the placenta, and increased oxygen consumption by the placenta and foetus. The foetal haemoglobin is glycosurated hence there is an increase in the red blood cells count (polycythaemia) in order to compensate for the demand of oxygen by the foetus. The baby is red due to polycythaemia.

Congenital Malformations

Poor control of sugar in the first seven weeks of pregnancy leads to congenital malformation. The most common occurrence is sacral agenesis which includes anencephaly and spina bifida. The cardiovascular system will have ventricular septal defects and transposition of the great vessels.

Other conditions that may transpire include intra uterine death as a result of too severe maternal ketosis. There may be increased perinatal death soon after birth from hypoglycaemia and respiratory distress syndrome in the newborn.

The babies are also prone to jaundice and hypocalcaemia. Birth trauma is also possible due to their large size and all these increase the risk of perinatal mortality if not well managed. Perinatal mortality is high in mothers who have developed nephropathy and retinopathy. Such women should avoid pregnancy.

This topic will be discussed in more detail in unit three of module two, which deals with care of the baby of a diabetic mother.

Risk Factors of Diabetes Mellitus

At this point you will deal with those who are predisposed to diabetes in pregnancy.

Certain women are at risk of developing gestational diabetes during pregnancy and may be identified when the history reveals one or more of the following:

- Diabetes in a close family member
- Recurrent abortion
- Unexplained still birth
- Congenital abnormality
- Large baby above 4.2kg
- Previous gestational diabetes or impaired glucose tolerance test
- Persistent glycosuria
- Excess of normal weight gain approximately 20%

Diagnosis of Diabetes During Pregnancy

Diagnosis of diabetes includes assessing the obstetric history of the patient which may include

- Unduly large babies
- One or more still births
- Neonatal death
- Polyhydramnios

The potential diabetic state of the woman should also be assessed. Checking for glycosuria two hours after a meal involves the use of reagent strips or tablets if approximately 6.7mmol/1 (20mg/dl) GTT. A full GTT involves:

- Fasting blood sample for glucose level
- Glucose load of 50gm oral glucose

(If one hourly, blood glucose level is equal to or approximately
7.7mmol/l or higher.)

The aim of GTT is to assess body response to a glucose load. The level of glucose should gradually decrease in the blood as follows:

- Fasting blood glucose: 5.8mmol/l
- One hour after ingestion of 80 to 100mg 75mg glucose equal to11.0mmols/l (195mg/dl)
- Two hours after ingestion of 80 to 100mg 9.0mmols/l equivalent to 150mg/dl
- Three hours after ingestion of 80 to 100mg 7.0mmols/l equivalent to 120mg/dl

After ingestion, the blood glucose rises initially but returns to normal within a given length of

time. At 28 to 34 weeks gestation, if after giving glucose and testing of venous sample, you find two out of four samples exceed the above, then a diagnosis can be made.
So far you have gone through the definition, classifications of diabetes, the effects of diabetes on pregnancy and pregnancy on diabetes, those at risk and how to diagnose the disease. Now you will go through the management prenatally, intrapartally and postnatally.

Pre Natal Care of the Diabetic Case
A mother who is at risk of developing diabetes during her pregnancy should be taken care of by the diabetic specialist, obstetrician, dietician and midwife. Ideally preconception counselling is done and the mother is stabilised. If she has nephropathy or retinopathy, pregnancy should be avoided. The aim of prenatal care is the control of blood sugar. To avoid hypoglycaemia and hyperglycaemia adjust the insulin dose.

Remember:
Maintain blood glucose level within the normal range of 4.0 - 5.5mmol/l.
Ensure that post-delivery the blood sugar does not exceed 7.2mmols/l.
Prolong the pregnancy to ensure foetal viability.

Once diagnosed, the mother should be followed up keenly by the two doctors fortnightly up to 32 weeks gestation and then weekly up to term.

Admission may be undertaken at 12 weeks and 32 weeks for stabilisation when hormonal changes may affect the mother. Hospitalisation is also done in case any complication or infection occurs.

Stabilisation
This is the care given to the admitted mother to bring the blood sugar down and maintain it. A daily urinalysis should be carried out six hourly using dextrostix, and also when necessary. Blood sugar should be measured twice weekly or daily if high.
Short acting insulin subcutaneously given on a sliding scale (measure) helps to avoid gross foetal abnormality. Scanning is done to assess the foetal maturity/growth and an x-ray may be carried out after 30 weeks gestation. The foetal wellbeing is also monitored by the mother noting the frequency of the foetal kicks.

Any infection, for example urinary tract infections, has to be detected early and appropriate treatment given. At term a pelvimentry is done to assess pelvic adequacy.

Once the mother is stabilised, she is discharged to continue with prenatal clinic fortnightly or weekly depending on the gestation. The mother is readmitted at 37 to 38 weeks for induction of labour if she has not gone into spontaneous labour.

Weight Monitoring
A dietician should be consulted but diet with high fibre produces a more constant blood glucose as carbohydrate is released for absorption more slowly. The need for carbohydrate increases as the foetus grows and must be reviewed.

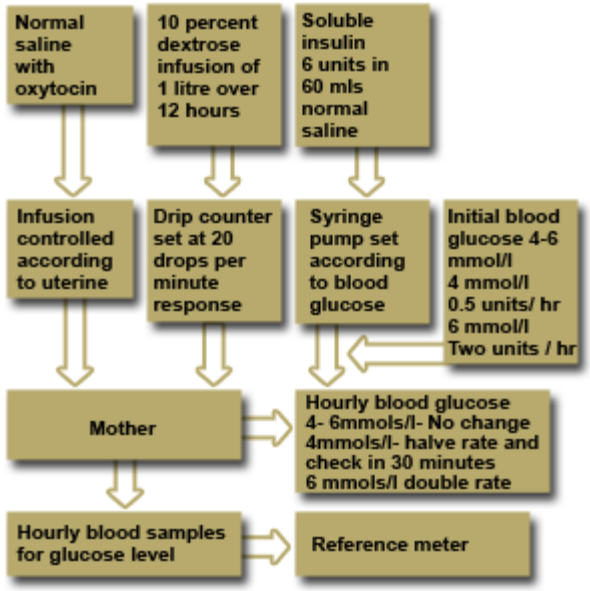
Can you think of four health messages concerning diabetes you would give to a pregnant mother?

Did you think of these?
Diet, self injection, use of diabetic kit for testing, reading and accurate recording of the blood sugar level, signs and symptoms of hypo/hyperglycaemia and what to do.

Management of the Diabetic Case During Labour
After the good care prenatally you still have to maintain observation during labour and delivery. The mothers who are at risk, for instance those with a bad obstetric history, the elderly primigravidae, the mother with pre-eclampsia and a baby that is too big, should not deliver vaginally.
At 36 to 38 weeks the mother is admitted for elective Caesarean section. On the day of operation, the morning dose of insulin is omitted. However, if the operation is performed at a late hour then one third or half of the intermediate acting dose of insulin should be given in the morning before starting the drip.
Premature delivery is not necessary if the diabetes is well controlled. If labour starts spontaneously prematurely, then dexamethasone is given to aid in lung maturity or salbutamol (ventolin) to relax the uterus. The drugs are given with care as they increase insulin requirements.

Aim at controlling blood sugar between 4 to 5mmol/l.
Hyperglycaemia increases foetal insulin production, which usually causes neonatal hypoglycaemia. The patient may be allowed a light breakfast or nil by mouth. In some cases subcutaneous insulin is given to mothers with insulin dependent diabetes mellitus.

Regimen in Management of Diabetes During Labour



Induction of Labour in a Diabetic Mother
To induce labour, artificial rupture of the membranes is done and oxytocin is put in normal saline, which is regulated depending on the uterine contractions.
For the nutritional needs and to prevent hypoglycaemia, a drip of 10% dextrose is set up and regulated at 20 drops per minute.
Soluble insulin is given by syringe pump at six units in 60ml of normal saline. This is regulated depending on the blood sugar levels. Throughout labour the blood sugar is checked hourly. If the results are lower than 4mmol/l, reduce the insulin dose by half. If they are higher, double the dose and check blood sugar every 30 minutes.

Remember:
Long acting insulin is NOT given during induction of labour because the insulin requirements fall by about 50 percent once the placenta is delivered.

Vigilant observations of the general condition of the mother, uterine contractions, foetal heart rate, maternal pulse half hourly, blood pressure, vaginal examination four hourly, and urinalysis two hourly (or more frequently) are made and charted on the partograph accordingly every half, two and four hours. Any deviation from the normal should be noted and the doctor informed. Sedatives and analgesics, which could depress the foetal respiratory centre, should be avoided. The physical care of the mother is maintained. The drips are regulated accurately. If the mother has not delivered within eight hours, she is re-assessed and caesarean section is performed.

During delivery a paediatrician should be present to take care of the baby immediately after birth. The principles of managing the baby after birth involve clearing the airway, providing warmth, giving oxygen and preventing hypoglycaemia and hypocalcaemia. The baby is admitted in the baby unit for management after the resuscitative measures are carried out.

Postnatal Care of the Diabetic Mother
The care of a diabetic mother after delivery is very important as it enhances the previous care. You will note that after delivery of the placenta the carbohydrate metabolism returns to normal almost immediately. Thus, the insulin dose has to be reduced by half immediately to avoid hypoglycaemia.
The intravenous infusion is maintained until the next meal. Meanwhile, the blood sugar has to be constantly checked and levels controlled within the normal range and the insulin dose adjusted accordingly. When she is breast feeding, the mother will need increased intake of carbohydrate by 50gm a day. Small amounts of insulin enter the breast milk but these are destroyed in the baby's stomach.
A diabetic mother is more prone to infection so care should be exercised to prevent it. On discharge, the health messages shared with the mother should include: diet, insulin administration, post natal and diabetic check up, personal hygiene, baby care and immunisation and so on.
Now you have gone through diabetes in pregnancy you must have realised that, if well managed, the risk to both mother and baby can be minimised. Throughout pregnancy, labour and delivery, the blood sugar should be controlled between 4-6mmols/l.

Attendants should be very keen to identify complications and manage the woman appropriately. You should also be able to decide the mode of delivery, which is either per vaginal or elective caesarean section. If the mother has not gone into spontaneous labour at term, induction of labour should be done under the supervision of an obstetrician, a diabetician and a paediatrician.

Malaria in Pregnancy

As you know, malaria is a very common condition in Kenya. You will cover malaria in detail later in the course.
In this unit you will cover the effects malaria may have on the course of pregnancy as it affects the health of the mother.
Malaria can cause the following in a pregnant woman and the foetus:

- Haemolysis of red blood cells, causing anaemia and jaundice
- Hyperpyrexia (very high fever), which may cause abortion or preterm labour
- Malaria parasites have affinity for the placenta and this interferes with nutrition of the unborn baby and may cause intra-uterine growth retardation, stillbirth or abortion

Management of Malaria in Pregnancy
The aim of treatment is to reduce the pyrexia and bring the attack to an end as quickly as possible. The following steps should be taken:

- Give a full course of fansidar three tablets stat.
  It is given as a single dose
- Administer a mild analgesic such as paracetamol
- Folic acid 5mg daily

In order to prevent of malaria in pregnancy, the following steps should be taken:

- Use of chemoprophylaxis
- Give all pregnant women two presumptive treatments for malaria at the beginning of second trimester and beginning of third trimester
- Encourage mothers to take other preventive measures including taking ferrous sulphate and folic acid, clear bushes around the home, drain all stagnant water near the home, use of insecticide treated mosquito nets and insecticides at night

Tuberculosis in Pregnancy

Tuberculosis will be covered in more detail later in the course. In this unit only the effects of tuberculosis on pregnancy will be covered.
The incidence of pulmonary tuberculosis in Kenya seems to be on the increase because of its association with the HIV and AIDS epidemic.

How does tuberculosis present in a pregnant woman?
Clinical presentation of pulmonary tuberculosis in pregnancy may be asymptomatic but typical symptoms include:

- Night sweats
- Fever in the evenings
- Weight loss
- General weakness
- Loss of appetite
- Productive cough
- Occasionally haemoptysis

Women with advanced pulmonary tuberculosis are often anaemic and may go into premature labour. Some of them will present with severe breathlessness secondary to pleural effusion or empyema thoracis. Those who are anaemic will not respond to haematinics until the tuberculosis infection is brought under control.
Diagnosis of tuberculosis in pregnancy can be done by:

- Sputum smear
- Chest x-ray
- Mantoux test

Management of Tuberculosis in Pregnancy
The aim of treatment is to make the mother sputum negative by the time the baby is born. A sputum positive mother can transmit the disease to her baby. The mother is admitted until the disease is controlled. This is mandatory. Chemotherapy is commonly used. Other therapies include:

- Streptomycin and thiazina (TH). Streptomycin is given for 60 days (intramuscularly injection) and TH for 18 months.
- An alternate short term therapy regime may be preferred and the commonly used one is a combination of rifampicin, ethambutol, isoniazid and Para AminoSalicycin acid (PAS) for a period of six to nine months.

During labour necessary steps should be taken to observe infection prevention measures to avoid development of puerperal sepsis. Care should be taken to avoid post partum haemorrhage, which may lead to anaemia during puerperium.
The mother is encouraged to breastfeed but remember to protect the baby from tuberculosis by giving prophylactic Isoniazid (INAH, 25mg per kg per day). INAH resistant BCG should be given since ordinary BCG may be inhibited by INAH. If INAH resistant BCG is not available, the baby should be given ordinary BCG at birth and separated from its mother for two weeks.
If the baby still gives a negative reaction to tuberculosis at six to eight weeks, it should be re-vaccinated with INAH resistant BCG and prophylaxis should be maintained with INAH for a further six weeks until mantoux conversion occurs.

Urinary Tract Infections

Although Urinary Tract Infections (UTI) also occur to women who are not pregnant, it is a common problem among pregnant women. In a pregnant woman, this infection presents in different forms, some of which are serious, and others of mild consequence. The common conditions of urinary tract infection in pregnancy are:

- Asymptomatic bacteriuria
- Acute cystitis
- Acute pyelonephritis

Asymptomatic bacteriuria is more common in pregnant women than in non-pregnant women. The condition is also twice as common in pregnant women with sickle cell trait and three times in those with diabetes as compared to normal pregnant women.
A woman with asymptomatic UTI may feel nothing except a slight pain when passing urine. She may also have offensive smelling urine. If the condition remains untreated during pregnancy, about 25 to 35% of these women will develop acute pyelonephritis.
Acute pyelonephritis occurs in two percent of all pregnant women and its effect may be fatal to the mother and/or her foetus. This occurs in those women with previous asymptomatic bacteriuria.
Acute cystitis is less common in pregnancy than asymptomatic bacteriuria. However, it causes more concern because of its symptoms.

As stated earlier, urinary tract infection occurs more frequently in pregnancy. This is because:

- The pregnant uterus causes pressure on the ureters and the bladder which delays emptying.
- The action of hormones on the smooth muscles of the ureters and bladder also causes them to relax and dilate easily. This causes urine to move more slowly down the dilated tubes and infection lodges in them easily.
- Normally the urinary tract mucosa is highly sensitive to invading organisms and the ureters go into spasmodic contractions to get rid of such invaders.

Clinical Presentation of Urinary Tract Infection in Pregnancy
Asymptomatic bacteriuria is usually diagnosed based on laboratory investigations. E-coli is the most common organism causing this condition and accounts for 80% of the cases.
Acute cystitis presents with urinary frequency and urgency, dysuria, suprapubic discomfort, urine is cloudy with offensive smell and if cultured, bacteria cells are identified.
In acute pyelonephritis, the patient will present with the following symptoms:

- Fever
- Nausea and vomiting
- Headache
- Urinary frequency
- Dysuria
- Shivering or chills
- Lower abdominal pain
- Dehydration if vomiting has been severe
- Renal angle tenderness on examination

Management of Urinary Tract Infections
Where possible, refer all suspected cases for further investigations and management to an obstetrician in hospital. In case this is difficult, give the patient a broad spectrum antibiotic such as ampicillin 500mg, six hourly for two weeks and assess her regularly to make sure that the pus cells are cleared.
If there is no improvement within 48 hours, refer the patient to hospital. In the hospital, a urine specimen will be collected for culture and sensitivity. The appropriate antibiotics will be prescribed.

Advise the patient to clean the vulva area from

front to back to avoid contamination with faecal matter from the rectum.

Remember:

Fever in a pregnant woman may induce abortions, premature labour and intra uterine foetal death.

It should be controlled and the underlying cause treated.

Pregnancy and HIV

Effects of Pregnancy on HIV

Pregnancy is a very important and emotional period for a woman. There are many issues and concerns that HIV/AIDS presents to pregnant mothers, their partners, their families and health care workers during this period.

In the early asymptomatic phase of HIV disease, pregnancy does not seem to have any significant effect on the progress of HIV. However, pregnancy will greatly affect women whose defence mechanism has already been destroyed. Pregnancy in such women will make the disease progress rapidly to full blown AIDS.

Effects of HIV on Pregnancy

HIV infection on the other hand, does not usually appear to seriously affect the pregnancy. However, HIV infection may cause an increased likelihood of intra uterine growth retardation, prematurity, still births and congenital infection.

An HIV positive woman has about 30% chance of transmitting the HIV virus to her infant. This may occur during pregnancy, at childbirth, or during breastfeeding.

HIV Screening During Pregnancy

HIV screening during pregnancy needs careful sensitive consideration. The decision to screen a woman for HIV infection is a joint consideration between the health worker and the woman, but the woman herself should make the final decision.

Any HIV testing must be accompanied by careful and adequate pre test counselling with proper post test counselling and support. Confidentiality of the results is important. There are many advantages of knowing whether a woman is HIV positive during her pregnancy.

Advantages

 t will help to monitor important HIV related infections/conditions, to make important management decisions during pregnancy, childbirth and postpartum period.

 It will then be possible to monitor the newborn for possible infections and manage problems accordingly.

 Some women may also choose to terminate the pregnancy and to prevent future pregnancies.

 A decision can be made to test her partner if she is found to be positive and to adjust to safer sexual practices.

However, antenatal HIV testing can also result in serious problems.

 Severe emotional and psychological disturbances and marital or relationship problems.

 Crises and problems associated with discovering the HIV infection for the first time.

The possibility of transmitting the infection to the foetus will raise many other problems and considerations for the mother and her partner.

These consist of the following:

- The choice of terminating the pregnancy
- The difficulties of diagnosing HIV infection in newborns
- The possibility of caring for a sick and dying infant
- The possible feelings of guilt, sadness and fear

If the HIV infection is newly diagnosed, the woman is under a lot of stress and will need a lot of support and counselling.

The health care services and the health workers should make a great effort to establish good support and care structures to manage women, their partners and their newborns. Support and care will need to be considered for the family.

Remember:

Women with HIV need extra care during pregnancy. They should be seen more frequently than usual.

It is very important to be on the look out for the development of any HIV related conditions, especially for infections such as vaginal and oral thrush and other opportunistic infections such as herpes. Other infections which should be treated are respiratory infections, diarrhoea, skin infections, sexually transmitted diseases and Kaposis sacroma.

It is important to provide counselling for encouragement and support to the HIV positive mother and her partner throughout the pregnancy. It is also important to start preparing them for possible problems that may occur after the pregnancy, that is, whether to breast or bottle feed the baby, possibility of HIV diagnosis

in the baby and the care and treatment that may be necessary.

During delivery, every effort should be made to avoid even minor trauma to the baby before birth as this may promote transmission of the virus to the baby. All injection sites on the newborn must be properly cleaned before inserting the needle to make sure the mothers' blood is not on the skin.

Breastfeeding should be avoided if the mother can safely feed her infant with other milk feeds. BCG immunisation should be given to the newborn as usual, unless the infant is very ill. The usual postpartum care should be given to the mother.

UNIT THREE PART ONE: LABOUR AND PUERPERIUM

You have successfully completed Units One and Two of this module on Reproductive Health. In the previous units, you learnt about obstetric anatomy, normal pregnancy, antenatal care, obstetric pharmacology and breastfeeding. As you learned, a well-managed pregnancy is likely to have a very happy ending. This unit will take you through labour, puerperium and the neonate.

The unit is divided into two parts. Part One deals with normal labour, the neonate and puerperium. In Part Two, we will discuss abnormal pregnancy and abnormal labour.

This unit is composed of two sections:

Section One: Normal Labour
Section Two: The Neonate

Unit Objectives

By the end of this unit you will be able to:

- Describe the process of normal labour
- Describe the management of mother during puerperium
- Describe the management of the newborn during neonatal period
- Identify neonatal complications, their management and prevention
- Apply the knowledge acquired in the management of a woman during labour and puerperium

SECTION 1: NORMAL LABOUR

Introduction

Your role as a midwife demands clinical expertise in supervising, caring for and supporting the pregnant mother during pre-pregnancy, pregnancy, labour and puerperium. You should be able to conduct deliveries on your own, and be ready to intervene when complications arise. It is also your responsibility to recognise and act promptly should you be presented with an abnormal condition, for example: mal-presentation, obstructed labour, or obstetric and neonatal emergencies.

In order to recognise and deal with complications of pregnancy, delivery, and the puerperium, you as a health worker must first be thoroughly familiar with the characteristics of normal pregnancy, delivery and puerperium. As you may remember, you have already discussed normal pregnancy in the previous Unit. In this Unit, you will review the features of normal and abnormal labour and consider how each stage of labour is managed. You will also examine the normal puerperium and review methods of monitoring a mother for post-delivery complications.

Do you know that a mother, who is psychologically well prepared during pre-natal care, will go through labour and delivery with ease? Research has shown that if a woman in labour has confidence in her caregiver she will experience a considerably lower level of labour pains. Professionalism, calmness and a 'matter-of-fact' manner on the part of the caregiver is a greater tranquilliser to the mother who is in pain than medicine (Leeder: 1994).

It goes without saying, therefore, that a midwife's behaviour and attitude towards a mother in labour makes the difference between painful and less-painful labour. A relaxed mother will usually have a shorter period of labour than a tense mother.

Before we proceed, let us look at the objectives of this section.

Objectives

By the end of this unit you will be able to:

- Define labour
- Explain the onset of labour
- Identify the three stages of labour
- Describe the physiological changes that occur during labour
- Describe the management of normal labour

Labour

The word labour is commonly used by both medical and non-medical people, but what does this term mean to you as a midwife?

Labour is described as the process whereby the foetus, placenta and membranes are expelled through the birth canal after 28 weeks of gestation. Labour, can be either normal or abnormal.

Normal labour has several important characteristics, which you should always remember.

These are:

- Duration - completed within 18 hours
- Occurs at term between 38 and 40 weeks
- Is spontaneous
- The foetus presents by the vertex
- Has no complications to either mother or baby
- The newborn child requires minimal or no resuscitation

The Onset of Labour

A midwife should ensure women have sufficient information to assist them to recognise the onset of true labour. A pregnant woman would be best placed to diagnos the onset of labour herself.
Some young women, especially the primigravidae (those pregnant for the first time), may fail to recognise true labour. It is important that you help them differentiate between false and true labour signs. The contractions of true labour are regular and intense. In false labour, the contractions are sporadic (Braxton-Hicks contractions). False contractions occur during the last weeks of pregnancy. The following table outlines some factors that can help to differentiate true and false labour.

The presence of the following signs and symptoms will give evidence that the mother is in labour:

- Contractions of the uterus, which are increasingly strong, painful and regular
- The cervix is taken up into the lower uterine segment causing dilatation of the cervix
- There is a mucoid blood stained discharge, which is called show
- Sometimes there is rupture of membranes with drainage of liquor amnii (amniotic fluid)

The causes that trigger the onset of labour are not known. However, many theories have been offered which indicate that both hormonal and mechanical factors play a big part. You will now study each of these factors in turn.

The Contrast Between True Labour and False Labour

Factors	True Labour	False Labour
Contractions	Regularly spaced	Irregularly spaced
Interval between contractions	Gradually shortens	Remains long
Intensity of contractions	Gradually increases	Stays the same
Location of pain	Back and abdomen	Mostly lower abdomen
Effect of analgesics	Do not abolish the pain	Often abolish the pain
Cervical changes	Progressive effacement and dilatation	No changes

Hormonal Factors
It is believed that close to term progesterone levels in the body fall, while at the same time levels of oestrogen (which is responsible for sensitising the uterine muscles) rise. The fall in progesterone levels is important because it has effect on muscle contractions. The rise in oestrogen levels meanwhile triggers the release of oxytocin, which causes uterine contractions. The foetal hypothalamus is believed to produce releasing factors, which stimulate the anterior pituitary gland to produce adrenocorticotrophic hormone (ACTH). ACTH stimulates the foetal adrenal glands to secrete cortisol, which causes relative levels of placental hormones to rise. These cause further uterine contractions.

Mechanical Factors

Uterine activity can also result from the mechanical stimulation of the uterus and cervix. This may be due to over stretching, as in the case of multiple pregnancy and polyhydromnios, or pressure from the presenting part, when it is well applied to the cervix.
It appears that there is a combination of hormonal (from both mother and foetus) and mechanical factors that set labour in motion.

Pre-Labour or Premonitory Signs of Labour

This is the period two to three weeks prior to the onset of labour when a number of changes take place. You will now look at these changes in greater detail.

Lightening
Two to three weeks before labour, the lower uterine segment expands allowing the foetal head to sink deep. The descent of the head and the body of the baby gives space to the lungs, heart and stomach, which enables these organs to function easily.
The symphysis pubis widens and the pelvic floor softens and becomes more relaxed, allowing further descent of the uterus into the pelvis.

Frequency of Micturition

The descent of the foetal head increases pressure within the pelvis. This limits the capacity of the bladder, which can cause irritation. The laxity of the pelvic floor muscles gives rise to poor sphincter control causing a degree of stress incontinence. This pressure results in the congestion of circulation to the lower limbs. Additionally the relaxation of the pelvic joint may give rise to backache.

Taking up of Cervix

The cervix is taken up gradually and merges into the lower uterine segment. Shortening of cervix is looked for when labour needs to be induced.

Contractions
The contractions of the uterus are coordinated by two pacemakers in the region of the cornua. These are located where the fallopian tubes join the uterine body. The muscle contractions start at the top corner of the uterus, spread to the fundus, and then downward. During normal pregnancy, the uterus contracts intermittently but the contractions are not strong enough to overcome the resistance of a normal cervix and do not lead to its dilation. The contractions of pregnancy become more frequent towards full term and get more painfuland noticeable. A multipara may have such 'false pains' for some days before the onset of true labour. They may come to hospital too early thinking they are in established labour. This is what is referred to as 'false labour'.

You will now look at uterine action and how contractions interact with the cervix.

Uterine Action

By the end of pregnancy, the uterus is divided into two anatomically distinct segments, known as the upper and the lower uterine segments.
The upper uterine segment is a thick muscular, contractile area from where the contractions begin. The longitudinal fibres retract, pulling on the lower segment and causing it to stretch, pushing the head down.
The lower uterine segment is thinner and develops from the isthmus of the uterus about eight to ten centimetres in length and is prepared for distension and/or dilatation. The lower segment stretches when being pulled by the longitudinal fibres. The force applied by the descending head or breech also aids the stretching.
The retraction ring which is an imaginary ridge, forms between the upper and the lower uterine segment. It is present in every labour and is perfectly normal as long as it is not marked enough to be visible above the symphysis pubis.

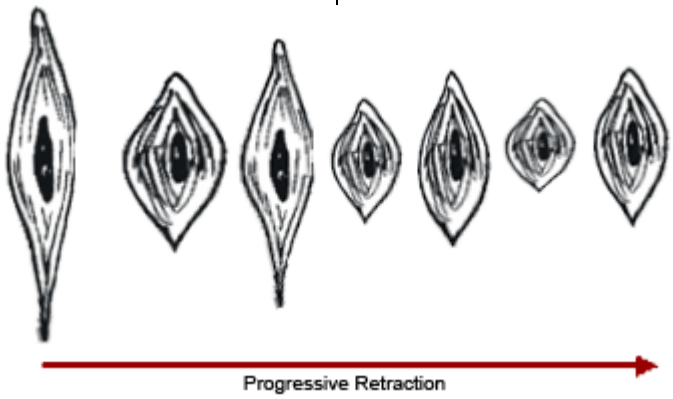
Fundal Dominance
During a contraction the uterus feels hard to touch. At the beginning of the process, contractions are painless and involuntary, and are controlled by the nervous system under the influence
of endocrine hormones.
The contraction starts at the upper part of fundus, spreading across, and by the time they reach the lower fundus, they last longer and are very intense. The peak of the contraction is reached simultaneously over the whole uterus and fades from all parts together. This pattern allows the cervix to dilate and the contracting fundus to expel the foetus.

Polarity
Polarity describes the neuromuscular harmony between the two poles or segments of the uterus throughout labour. The upper pole contracts strongly and retracts to expel the foetus. The lower pole contracts slightly and dilates to allow expulsion of the foetus to take place.

Contraction and Retraction

When labour starts, approximately 280 days from the first day of the last menstrual period, the contractions change in character. They become regular and more painful. Labour contractions differ from those of pregnancy in that they are followed by retraction. This is characteristic of uterine muscle in labour. The contracted muscle does not return to its original length when the contraction passes off.

Each succeeding contraction leads to further shortening of the muscle fibres so that the uterine cavity becomes smaller and smaller. This is what makes the cervix dilate. This process is illustrated in the figure below.

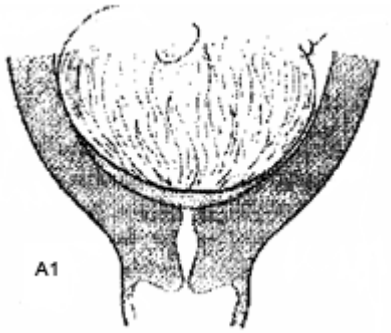


When talking about contractions, you as a midwife are concerned with three factors, namely the strength, the duration and the frequency of the contraction.
When you talk of the strength of a contraction, you identify it as one of three categories: weak, fair or fairly strong, and strong. The strength of a contraction is measured according to the time it has taken. Thus, a contraction which takes 10 to 30 seconds is said to be weak, one that takes 30 to 40 is said to be fair or fairly strong and one that lasts for 40 to 60 seconds is said to be strong.
The duration refers to the time taken by a contraction, for example a weak contraction lasts for 10 to 30 seconds.
Frequency, on the other hand refers to the number of intervals between one contraction and the next. If a mother has one contraction after every 45 minutes, the frequency is written as 1:45.

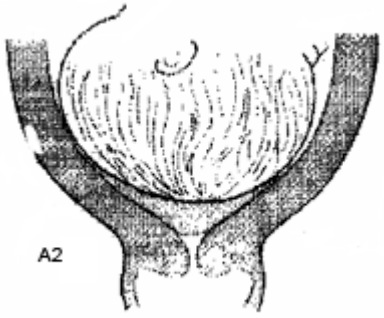
The Shortening and Dilation of The Cervix

Before labour begins, the cervix of a primagravida is a thick hard cone which protrudes into the vagina. The canal is at least one inch long. When labour begins the strongly contracting upper segment of the uterus starts retracting and getting shorter, while the thinner lower segment of the uterus gets pulled away from the presenting part. This stretches the lower segment. The latter, in turn pulls the internal Os. This dragging away of the internal Os from the presenting part starts dilating the upper part of the cervical canal. This goes on until the canal is shorter and shorter and finally there is no canal at all. The canal becomes part of the uterine cavity with only the undilated external Os and the thinly stretched cervix separating this cavity from the vagina. When this happens, we say the cervix has been 'effaced' or 'taken up'
Click the links to reveal the stages of the effacement of the cervix:

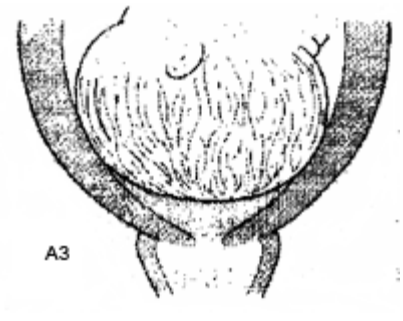
Cervical canal before effacement



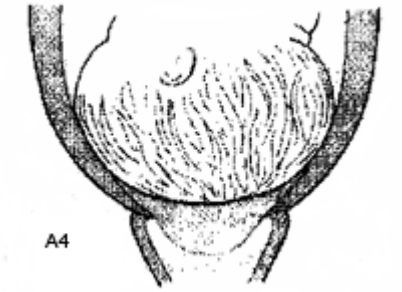
Partial effacement



Effacement almost complete



Effacement fully complete



In a primigravida the cervix usually becomes almost fully effaced before any dilation takes place, while in multiparous women the two processes take place together. The cervix of a multipara might be already effaced and be dilated enough to admit a finger up to the internal Os even before labour starts. These signs of labour are assessed by doing a vaginal examination, though with experience, you can also get a good idea by doing a rectal examination.

***The way you guide a mother has a great influence on the progress of her labour*.**

The Show

Throughout pregnancy the cervical canal is sealed by a plug of mucus known as an operculum. Together with the intact membranes this prevents organisms ascending into the uterine cavity.
When labour starts, the internal Os is pulled away from the foetal membranes and the canal is opened up. This releases the mucous plug which oozes out of the vagina mixed with a little blood. This is called the 'show'.

The Stages of Labour

Labour is divided into four stages, although in real practice, the process is a continuous one and change from one stage to the other may not be clearly obvious. The four stages of labour are known as First stage, Second stage, Third stage and Fourth stage.
Each stage will now be covered in detail.

The First Stage
This is known as the stage of cervical dilatation. This stage begins when regular, painful uterine contractions start and is detected clinically by the thinning and effacement of the cervix, followed by its dilatation. The normally thick cervix becomes thinned out and stretched over the presenting part. The first stage is completed when the cervix is fully dilated and the presenting part starts being expelled. This stage has two phases, known as the latent and the active phase.
The contractions of the uterus dilate the cervix. The dilatation of the internal Os causes the separation of the chorion from the decidua closest to it. A small bag of membranes is formed and is forced into the internal Os by the intrauterine pressure. At the beginning of each contraction, a little more amniotic fluid is forced into the bag of membranes. The head of the foetus then comes down like a ball valve and separates the amniotic fluid above it from that in the bag. The bag of membranes may remain intact until nearly the end of the first stage. However, even if the membranes rupture early the cervix will still become dilated as it is drawn up over the presenting part by the retraction of the upper segment.

During the first stage, the foetus does not move downwards to any great degree. When a certain amount of fluid has left the uterus after the membranes have ruptured, a new form of pressure comes into play, namely foetal axis pressure. The upper pole of the foetus, normally the breech, is pressed on by the fundus of the uterus, while the lower pole is pressed down onto the lower segment and cervix. Should the membranes rupture early, foetal axis pressure will operate at an early stage. In modern practice, the membranes are often deliberately ruptured during labour because this is believed to encourage more efficient uterine action and shorten labour. You should be cautious carrying out this procedure in this era of HIV.

The duration of the latent phase of labour need not be defined too accurately. Dilation of the cervix from 0 to 3cm can take six hours, but slower progress may be normal and is perfectly acceptable provided that the woman is comfortable and in no way distressed. Between 3 and 10cm dilatation (that is in the active phase of labour) the cervix should dilate at a rate of about 1 cm per hour, giving a theoretical duration of seven hours for this phase of labour in both primiparous and multiparous women. During the early part of the latent phase the pains may not be very severe but towards the end of the active phase they are often very distressing, constituting the most painful part of labour. Vomiting and reflex shivering are common at the end of the active phase of the first stage of labour.

By now the membranes have ruptured. If the membranes remain intact when the cervix is fully dilated, the onset of the expulsive stage may be delayed. This is because the cervix does not receive the pressure of the head, which helps to stimulate the uterus to increase its activity. If the membranes remain intact after full dilatation, they should be ruptured with toothed forceps or a sterile plastic amnihook during a contraction.

Second Stage

This starts with the full dilatation of the cervix and
the expulsion of the presenting part and finishes with the complete delivery of the baby. As you know,
there may be very little descent of the foetus during
the first stage. However, in the second stage, the
resistance offered by the lower uterine segment and
the cervix has been overcome and the presenting
part can be pushed down onto the pelvic floor. The resistance of the pelvic floor then has to be overcome by uterine contractions, aided by the action of the voluntary muscles of the abdominal wall and the diaphragm.

In the absence of an effective epidural block, full dilatation of the cervix is accompanied by a bearing down sensation during contractions and women are usually encouraged to push. As the contraction comes on, the woman takes a deep breath, then holds it and subsequently bears down with all the force of her abdominal muscles. These partly voluntary, partly reflex expulsive efforts place the foetus under additional stress and pushing should, therefore, not be allowed to continue for more than one hour. If delivery is not imminent, assistance in the form of Ventouse extraction, forceps delivery or even a Caesarean section may be necessary.

Third Stage

This stage commences immediately after the birth of the baby. It includes the delivery of the placenta and membranes as well as the control of bleeding. At this stage the uterus contracts down to follow the body of the foetus as it is being born. As the cavity of the uterus becomes smaller, the area of the placental site is diminished. The placenta is then cut off from the spongy layer of the decidua basalis. Further uterine contractions expel the placenta from the upper segment into the lower segment and through the vaginal vault. This process, whereby the placenta leaves the upper segment to the lower segment and through the vagina, is referred to as separation and descent.

Fourth Stage

This is the period from the delivery of placenta and membranes to the end of the first hour postpartum. The uterus is firm at level of two fingers breadth above the umbilicus. Restoration of physiological stability is established. During this period myometrial contractions and retraction, accompanied by vessel thrombosis, operate effectively to control bleeding from the placenta site. Failure of this mechanism could result in excessive blood loss (postpartum haemorrhage (PPH)) that could be life threatening. The mother should be closely observed for haemorrhage, urine retention or hypotension. The mother and child relationship should be initiated and encouraged, as it has an effect to the subsequent quality of their relationship and bonding.

Physiological Changes in Labour

You will continue with the study of the four stages of labour, paying particular attention to the physiological and mechanical changes that are involved.

Physiological Changes in the First Stage of Labour

This is the stage of dilatation of the cervix. On average, it lasts eight to twelve hours in a primigravida and six to eight hours in a multipara. It should not go beyond 14 hours in either. This stage is characterised by the uterus doing an immense amount of muscular work in the form of contracting and relaxing. Contractions are involuntary in that they do not come on through voluntary effort of the woman nor can they be voluntarily stopped. They are peristaltic and regular.

Contractions at the start of labour come every 10 to 15 minutes and last between 30 to 45 seconds. They increase in frequency and strength as labour progresses until they are separated by a minute or two. Towards the end of the first stage they last for one minute. The relaxation phase during which the muscles remain retracted also shortens.

Each contraction begins with a gradual build-up towards a peak of intensity. This is followed by a relaxation phase. During the relaxation phase, the muscle recovers and gets ready for the next contraction. This relaxation phase is important to both the foetus and the mother during the first and second stages of labour.

During a contraction the circulation through the uterine wall is reduced and the foetal heart rate is slowed but regains its normal rate as soon as the contraction has passed. If there is increasing foetal tachycardia between contractions or if the bradycardia is prolonged after each contraction, then foetal distress sets in. If the uterus contracts continuously the foetus dies from lack of
oxygen (anoxia).

The mother is also able to relax during the relaxation phase. However, if the uterus contracts continuously, the mother also gets very exhausted because the uterus uses up a lot of energy during contractions. If this goes on for too long, as is the case during prolonged labour, her energy stores become depleted and maternal distress sets in.

As the mother will not be able to eat or absorb much by mouth, she should be given supplementary carbohydrates intravenously. In a normal first stage, oral fluids to which additional sugar has been added are sufficient.

As the uterus contracts and retracts more and more, the upper muscular part becomes progressively thicker. The less muscular lower segment is pulled upwards over the presenting part and becomes thinner. The cervix becomes effaced. The effacement is followed or accompanied by progressive dilation of the cervix until full dilatation when the uterus becomes a continuous cavity with the vagina.

A fully dilated cervix is 10 cm dilated. During the first stage the uterine cavity gets progressively smaller but the foetus moves down very little. The presenting part helps in dilating the cervix. During this stage the woman should not use her voluntary efforts to bear down as this will exhaust her unnecessarily and may cause oedema of the cervix and/or foetal distress.

Management of Normal Labour in the Admission Room

The proper management of labour is essential, if you are to avoid problems or to detect them early when they occur. The patient will come to you believing she is in labour. You should be able to assess and decide whether she is in labour or not. The patient may be in early labour, but often she might arrive in the late second or even third stage.

If you are sure she is not in labour send her home to wait. If she is in labour, keep her in the ward and continue monitoring her progress. Danger, especially to the foetus, can arise suddenly
and unexpectedly

No labour should be assumed normal until the fourt stage has successfully concluded.

Admission

When you admit a mother in the first stage of labour, what activities should you carry out?

You would take the patient's personal history, conduct a physical examination and carry out tests/investigations.

On admission, you should check the woman's antenatal card for any identified risk factors. It will also help you to see if there were any abnormalities during her pregnancy. The records will also have information on her medical and obstetric history. If she has not been attending an antenatal clinic, this is the time to take detailed history as covered in unit two of this module.

Once this information has been established, find out more about the present labour. Take her history, do an examination and carry out the necessary investigations to establish the stage of labour and the state of the mother and the

foetus. The steps you should take will be covered on the following pages.

History Taking
A detailed personal history should have been taken during pre-natal care. However, if this has not been done, this is a good time to get it recorded. Make sure the names are correctly spelled because this can eventually result in problems when registering the baby. Review the last day of menstruation to calculate the expected date of delivery. Check her age, parity and contraceptive history. Assuming that a detailed personal history had been taken during pre-natal care, you should now take information about the following:

- Any presence of show
- Presence or absence of contractions
- Onset of contractions and their characteristics
- Activity of the foetus
- Rupture of the membranes
- Any treatment given
- Food taken in the last four hours

After taking the personal history, there are some observations that you should make.

Can you think what these might be?
Assess the general condition and progress of labour in the mother, as well as vital signs and blood pressure. Test urine for protein, glucose and ketones and report any abnormalities.

After taking the history and observing the mother you now need to take carry out a thorough physical and vaginal examination.

Head to Toe Physical Examination

You should start by explaining to the mother that you want to examine her. The health care provider should appreciate the psychological aspect of a woman in labour, respect her feelings and the need for company or privacy. They should support the woman and her partner or family during labour, birth and the immediate postpartum period. Failure to do this has contributed to many women delivering at home, a place where they are appreciated but without an assured clean and safe delivery.

Can you remember how to examine the mother systematically?

How to Examine the Mother Systematically

When examining her, check on her general condition. Check if she is exhausted, anaemic, in great pain, dehydrated, or with generalised oedema. You should also check her height. This will enable you to exclude any risk factors.
You should also take her vital measurements including her blood pressure, pulse, temperature, and respiratory rate. Conduct an abdominal examination checking for:

- Height of fundus
- Over-distension of the abdomen, scars or other abnormality
- Over-distension of bladder
- Possible presence of twins or multiple pregnancy
- Contractions - frequency, length, type and strength
- Lie of foetus - this is the relation of the long axis of the foetus to the long axis of the uterus (it can be longitudinal, oblique or transverse)
- Rate and rhythm of the foetal heart

You should also check on the presentation. Which part of the foetus is at the pelvic brim? Is it a head (cephalic) or the buttocks (breech)? Check the attitude; whether the head is well flexed or extended. A well-flexed head presents the smallest diameter and delivers easily. A deflexed head presents a larger diameter and causes delayed or obstructed labour.
Finally check the position of the relation of the foetal parts to the mother. This is confirmed through a vaginal examination by checking the position of the foetal occiput relative to the mother. The position of the foetal spine is the same as that of the occiput.

Refer to unit two for a more detailed description of this systematic examination. After a thorough head-to-toe examination you should perform a vaginal examination.

Vaginal Examination in Labour

This is an important examination as it can give you a lot of information, which you might not get from an abdominal examination. On the other hand, if you do it often it is uncomfortable for the woman and you might introduce an infection into the uterine cavity, especially if the membranes have ruptured. To avoid infections, you should scrub and put on gloves as you would for any

other sterile procedure. Then thoroughly swab the perineum of the woman with an antiseptic solution such as Savlon or Hibitane, or boiled water if these are not available.
A vaginal examination is necessary to:

- Check if the patient is in labour and what stage of labour (this is done on admission of the patient)
- Assess the progress of labour (this is done every four hours during the first stage of labour)
- The degree of effacement and dilatation of the cervix and the station of the head relative to the ischial spines will give you the necessary information
- Check that there is no prolapse of the cord when the membranes rupture

Remember: Do not do a vaginal examination if the mother has an ante-partuhaemorrhage, because if there is placenta praevia, severe haemorrhage will occur.

A vaginal examination is contraindicated if the mother has ante-partum haemorrhage unless it is performed in an operating theatre. In case of pre-eclampsia, the procedure should be performed only after giving a sedative.

Vaginal Examination

- Arrange your vaginal examination pack with cheatle forceps and pour solution.
- Scrub your hands for at least five minutes.
- Glove yourself methodically to prevent contamination.
- Explain the semi-lithotomy position that should be maintained during the examination to the mother.
- Swab the vulva and drop the swab methodically (used swabs should be decontaminated in jik before disposal).
- Ask the mother to breathe in and out while you perform digital examination.
- With the right hand, gently insert the fingers obliquely inside the vagina with the thumb, facing the symphysis pubis. Your left hand should be on the mother's abdomen.
- The fingers to be introduced are held on a higher level than the vaginal orifice during insertion to avoid contact with the anus. Fingers should not be withdrawn until the required information has been obtained.
- The fingers are directed along the anterior wall of the vagina. The wall should feel soft and dilatable while the vagina should be warm and moist.
- The fingers are then directed upwards to the position of the cervical Os.
- At times the Os is not felt readily, the fingers should then be directed backwards and upwards.

While performing a vaginal examination, you should observe the mother's non-verbal communication.

The Vagina

The Cervix

- Is it bruised or oedematous?
- Is it firm or soft?
- Is it taking up, that is effaced?
- How much is the Os dilated?

Do not insert more than two fingers in the cervical Os.

The Membranes

After deciding the state of the cervical Os, check for presence of membranes. Note the following:

- Are they ruptured or intact?
- If intact are they bulging?

The Cord

- Is it presenting or prolapsed?
- If prolapsed is it pulsating?

The Presenting Part

Next, determine the level of the presenting part. You should ask the following questions:

- Is it fitting the pelvis and cervix well?
- If it is the head, can you feel a suture or fontanel? Which one?
- Is it well flexed?
- If the head is at the brim it, will not be felt vaginally unless you push it down with your left hand which is on the mother's abdomen
- If the head has just engaged, it can be touched or just be tipped
- If the head is deeply engaged, the head is felt at the level of the ischial spines

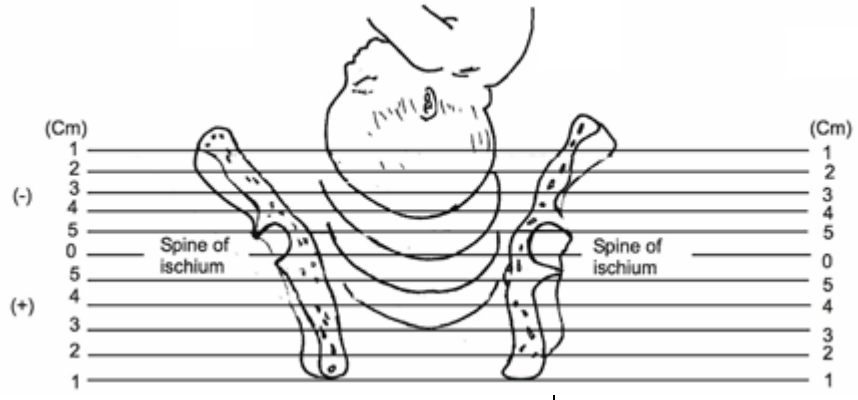
While performing a vaginal examination, you should observethe mother's non-verbal communication.

The Presenting Part

The station or level of the presenting part is the level to which the presenting part has descended in the pelvis. The level of the presenting part is expressed in relation to the easily palpable ischial spines. You can also state if it is above the brim, at the brim, in the cavity or at the outlet.

Remember that if the presenting part is at the brim then it is at station -5. As the head descends down in to the cavity of the pelvis it decreases from -5, -4, -3, -2, -1. By the time it is at the ischial spines, it is said to be at 'zero station'. It reappears from the pelvic outlet into the perineum, which is classified as +1, +2, +3, and +4. By the time it is seen at the perineum it is at station +5.

The Station of the Foetal Head



Observe the position of the presenting part. This is the position of the foetal parts in relation to the parts of the pelvis. A point on the foetus, such as the occiput in a vertex presentation, is usuall used as a reference point.

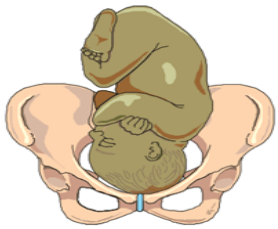
To get the position right, you have to palpate the sutures and fontanel to determine their position relative to the pelvis. This can be confirmed by abdominal examination.

In a breech or a face presentation, the reference points on the foetus are the sacrum and the chin or mentum respectively. A soft mass is felt. Foetal genital parts or the anus may be felt with the examining finger. The position is determined by the position of the sacrum in relation to the side of the mother's pelvis. The left side is expressed as left sacro-anterior (LSA) or the right side, which is known as right sacro-anterior (RSA).

In a vertex presentation, when the occiput is persistently posterior, this causes prolonged labour. In a cephalic presentation, you will feel the hard head sutures and fontanel. Determine whether it is the anterior or posterior fontanel by its shape. If it is the posterior fontanel, then the position is occipito-anterior. If it is the anterior fontanel then the position is occipital-posterior.

Face presentation is important as the chin is the facial landmark. Note how the position of the chin is related to the mother's right thigh (RT) or left thigh (LT), side of the pelvis and the anterior and posterior position expressed as RMP (right mento posterior). You should also note the brow or sinciput presentation on vaginal examination (VE). You should be able to feel the brow, frontal sutures and possibly the posterior fontanel. The extension is usually a temporary presentation, which converts to face or occiput presentation during labour. However, at times it persists and in such instances, a caesarean section is usually called for.

Illustration of baby in mothers womb showingnormal presentation



Note whether the long axis of the body of the foetus is perpendicular to that of the body of the mother. A left acromiodorso posterior (LADP) indicates that the baby's lower shoulder is to the

mother's left and its back is towards her back. A compound presentation is when the hand or occasionally a foot lies alongside the head.

The Pelvis

Next check for moulding or caput succedaneum.

What is moulding?

Moulding is when the diameters of the foetal skull are reduced in size. During labour the bones of the foetal skull tend to overlap at the sutures so that the head can easily pass through the birth canal. During a vaginal examination this is how you should check for moulding:

- In cephalic presentation, run the finger on the head feeling for the sutures
- Judge the degree of moulding by feeling the amount of overlapping of skull bones
- Check for caput

The pelvis is assessed to check if it is adequate (see unit two). The following factors should be checked:

- Is it roomy?
- Are the sidewalls well spaced?
- Can you touch the promontory of the sacrum easily?
- Is the pubic arch wide enough?
- After checking for moulding, direct the fingers behind the head and make an effort to reach the sacro-promontory. The palm of the hand should be facing upwards. Promontory of the sacrum should not be reached.
- With the palm facing downwards run the two fingers down along the hollow of the sacrum and determine the shape. The hollow of the sacrum should be curved.
- The two fingers are then moved to where the ischial spines are located on either side of the pelvis. Run the finger along this area to determine whether or not the ischial spines are unduly prominent. Or else you can stretch your fingers to see if the spines are prominent. The ischial spines should not be prominent.
- As you move the fingers with the palm facing upward, on reaching the pubic arch check if it can accommodate two fingers. The apex usually should accommodate two fingers.
- Make a fist facing downwards then place the fist between the ischial tuberosities. The Intertuberosity should accommodate four knuckles. Check if it does.

The Discharge

Withdraw the fingers and check if there is:

- Any vaginal discharge
- Any smell
- Any liquor or meconium staining
- Any bleeding

The following steps should be taken as part of your investigation:

- Take a urine sample for albumin and sugar
- Check for acetone, especially if the patient is in prolonged labour
- Take blood for haemoglobin and cross matching if the patient is anaemic or might need an operation

By this time you will have gathered enough information as to the stage of labour and whether the patient belongs to the 'at risk' category and needs referral or not.

Management of First Stage of Labour

When managing the first stage of labour, you should keep to the following procedure, making sure you record your findings in a partogram:

- Admit the patient to the waiting room, reassure her and introduce her to other patients
- Reassure her and explain what is being done at every stage
- Give her an enema only if she is in early labour
  (this will reduce the risk of faecal soiling and infection at delivery)
- The patient may have a warm bath and change into a hospital gown
- Encourage her to walk about and empty her bladder frequently
- Give her plenty of fluids with sugar or glucose as she has to work hard and needs the energy
- Do not allow any solid foods as the stomach takes a long time to empty in labour

Should she need an operation and anaesthesia, the emptying of the stomach will be difficult and she might vomit and inhale the vomit.

If she is in much pain and the delivery is still far off, give her a sedative.

Check the following regularly:

- Check the foetal heart rate half hourly or more often if you suspect distress
- Check uterine contractions (strength, type, frequency and duration) as well as maternal pulse, BP and temperature
- Check the urine output and check for albumin and acetone if indicated every two hours
- Every four hours check the level of the presenting part and the degree of dilatation of the cervix
- Constantly check the woman's reaction to labour and be aware of her needs, especially for pain relief. You can repeat pethidine 50 mg IM if cervical dilatation is still 5 cm or less. Do not give more pethidine if delivery is imminent as it depresses the baby's respiration
- Towards the end of the first stage, she can rest on her side, or in any position she finds comfortable, for example, squatting
- Discourage pushing or bearing down before the cervix is fully dilated
- Early pushing only exhausts the woman and will cause oedema of the cervix and interfere with normal dilatation
- If the bladder is full and she cannot empty it on her own, catheterise her using aseptic technique
- When the membranes rupture, usually at the end of the first stage, check the colour of the liquor for meconium staining, the foetal heart rate and do a vaginal examination to exclude prolapse of the cord

Write down the observations you are supposed to record in the partogram?

- Vital signs
- Blood pressure
- Details of vaginal examination
- Contraction strength and number of contractions in ten minutes
- Fluid balance
- Urinalysis
- Drugs administered

When observing the contractions, you should note the following:

- Uterine contraction duration, strength and frequency
- In early labour the contractions are mild, lasting 20 to 30 seconds and are infrequent
- As labour progresses, the contractions become stronger, lasting 40 to 50 seconds and are about three contractions per ten minutes
- The uterus should always relax between contractions
- The cervix dilates progressively from 4cm at a rate of approximately 1cm and 1.5cm hourly in primigravida and multigravida respectively
- The descent of the presenting part can be noted by abdominal palpation or vaginal examination. Avoid unnecessary vaginal examination

Remember to allay the mother's fears and reassure her throughout your examination and indeed throughout labour. A mother in labour needs to feel loved, cared for and to be treated with dignity.

Prevention of Infection

To prepare for clean delivery you should:

- Give an enema or suppositories
- Avoid shaving the pubic hair, given current HIV/AIDS prevalence rates
- Allow the mother to have bath whenever she wishes as it is soothing during labour
- Practice aseptic techniques through labour
- Ensure a clean environment within and around the ward

After conducting a thorough examination of the mother and recording your observations in the partogram, there are a number of things you can do to make her feel comfortable during her labour i.e. allow her to change position and move around, use back massage, have a chosen companion with her during labour, allow her to take fluids as required and return the placenta to parents if so desired and directed by the culture. However do not forget to check on the foetus especially if you suspect foetal distress.

Write down any signs of foetal distress that you can think of.

If you diagnose foetal distress what steps might you carry out?

The Second Stage of Labour

As mentioned earlier, the second stage of labour begins with full dilatation of the cervix. It is the stage of descent and expulsion of the baby. It normally lasts from one to two hours on average in primigravida, and half an hour in multipara. If this stage goes beyond two hours it is considered abnormal. The contractions become stronger, lasting 40 to 60 seconds, with a one-minute
recovery interval.
The retracted and contracting uterus pushes the foetus down into the pelvis. During the relaxation phase the pelvic floor pushes the presenting part up again but the retracted uterus does not allow all the progress achieved to be lost. Progressively the presenting part moves down until it reaches the pelvic floor. The presence of a foreign body in the vagina makes the woman want to bear down even against her will. The voluntary muscles of her abdomen and diaphragm help the uterus in the pushing. As a contraction comes the mother should be instructed to take in a deep breath, hold it and then bear down.
These expulsive efforts are partially voluntary. The vagina widens to accommodate the baby. It is now a continuous cavity with the uterus. The presenting part may push out faeces from the rectum as it goes through the vagina. When the presenting part reaches the pelvic floor it starts stretching the vulva, causing much pain, especially in the primigravida. For some time it keeps popping out during a contraction and receding back during the relaxation phase. After some time it can no longer slip back. This is known as 'crowning'. The head will have passed through the bony outlet of the pelvis. The perineum becomes stretched and paper-thin and it is at this stage that an episiotomy should be performed if necessary. The next contraction normally expels the presenting part.

Mechanism of the Second Stage of Labour

The mechanism of labour refers to a series of movements the foetus has to make to pass through the birth canal.

Lie

Lie means the relation of the foetus to the long axis of the uterus. It may be longitudinal, oblique or transverse.

Presentation

The presenting part of the foetus is that part which is in or over the pelvic brim. Its position is examined in relation to the cervix. It could be vertex, face, or a breech. However, 95% of all presentations are cephalic, and the presenting part is usually the vertex.

Position

The position describes the relationship of a selected part of the foetus to the maternal pelvis. For example, in a vertex presentation the selected part is the occiput. With face presentation it is the chin, and with a breech presentation, it is the sacrum.

Attitude

he pelvis is a curved passage with different diameters at the inlet, mid-cavity and outlet as you saw in unit two. The foetus, therefore, has to adapt itself to the shape, size, and curve of the pelvis at different levels as it descends.
To be able to manage labour skilfully, you need to understand the natural movements made by the baby so that, when assisting in delivery, you can follow the movements rather than oppose them.
The factors, which influence the mechanism of labour, are known as the three 'Ps': power, passage, and passenger.

Power

The stronger the contraction in a well prepared mother, the better the outcome of labour.

Passage

The size, shape and resistance of the birth canal including the bony pelvis, cervix, vagina and pelvic floor may speed up or slow down the process of delivery. A gynaecoid pelvis and a fully dilated cervix speed up the process.

Passenger

This refers to the size, lie and presentation of the foetus, as well as the placenta and membranes. For the foetus, a vertex presentation makes labour shorter as the presenting part fits well on the cervical Os and stimulates the cervix to dilate faster.

It is important to remember that descent occurs throughout and as mentioned earlier, ninety five per cent of all presentations are cephalic, and the presenting part is usually the vertex. This areas boundaries include the bregma or the anterior fontanel, the perietal eminences and the posterior fontanel. The presenting diameter is, therefore, the smallest - 9.5cm. In order to present with the smallest diameter, the head must be well flexed on the neck with the chin touching the chest. As the leading part meets resistance of the pelvic floor it rotates 1/8th forwards until it comes under the symphysis pubis.
The mechanism of labour in a cephalic vertex presentation includes the following steps:

- Engagement and descent
- Internal rotation
- Birth by extension of the head
- Restitution and external rotation

You will now look at each of these steps in detail.

Engagement and Descent
Engagement is the descent of the presenting diameter through the pelvic brim. The head usually engages late in pregnancy in the primigravida while in the multipara it does not engage till labour starts. The head enters the pelvic brim in oblique diameter with sub occipital frontal diameter (10.5cm). With good uterine contraction, there is more flexion of the head. The head engages with sub occipital bregmatic (9.5 cms) oblique diameter of the pelvis brim.

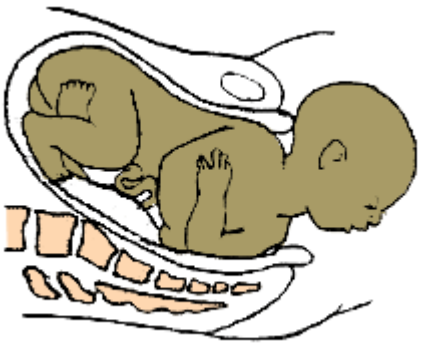
Internal Rotation
The head rotates 1/8th of a circle. Such a rotation is achieved by the action of the uterine muscle pushing downwards. The pointed vertex presents on the broad levator ani muscle. When the vertex reaches the perineum, the occiput turns from the posterior to the anterior position. Anteriorly there is more room for further descent. When the occiput is below the symphysis pubis, crowning
takes place.

Internal rotation of the foetus

Birth By Extension of the Head

Once the occiput has escaped from under the symphysis pubis, the head extends forward. The nape of the neck is pressed firmly against the pubic arch. This extension of the head causes the anterior part to stretch the perineum gradually. Further extension allows the sinciput, face and chin to escape the perineum and the head is born by extension. Extension is the result of action from two forces. The abdominal and thoracic muscles exert downward pressure. The pelvic floor and perineum resist this pressure and push the head forward and upward through the weak area, which is the vagina.

Sinciput and face delivered



Restitution

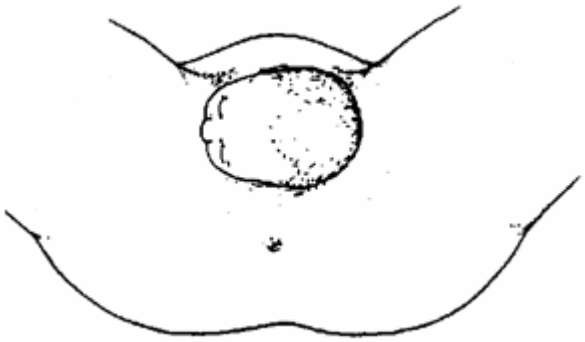
The head turns 1/8 of the circle to the left, back to where it was before. This rotation takes place to undo the twist, which occurred during the

previous internal rotation. This 'undoing of the twist' is known as restitution.

Internal Rotation of the shoulder
When the head is passing through the level of the ischial spines and the outlet in anterior posterior position, the shoulders enter in the oblique diameter of the pelvis and rotate forward 1/8 of a circle. The shoulders are now in the anterior posterior diameter of the outlet. The anterior shoulder escapes the symphysis pubis while the posterior shoulder sweeps the perineum.

External Rotation of the Head
As the internal rotation of the shoulders takes place, the head, which has already been born, rotates 1/8 of a circle as in restitution. The head now lies in the lateral position.

External rotation of the head



Lateral Flexion
Following these movements the body bends sideways to follow the curve of the birth canal. The anterior shoulder escapes under the symphysis pubis and the posterior shoulder sweeps the perineum. The body of the baby is born by lateral flexion.
To recap, the cardinal movements of labour in a vertex presentation are:

1. Engagement
2. Descent
3. Flexion
4. Internal rotation
5. Extension
6. External restitution of the head
7. Expulsion

An easy way to remember these movements is by use of the mnemonic device -'**E**very **D**ecent **F**amily **I**n **E**urope **E**ats **E**ggs'.

Management of the Second Stage of Normal Labour
Before you begin, try to remember the probable signs of the second stage of labour. Write them down on a piece of paper.

- Expulsive uterine contraction. This may happen in occipital posterior or when the head is deeply engaged with fully loaded rectum (in a case where the mother is not in second stage)
- A trickle of blood
- There may be no bleeding while the cervix is fully dilated
- Pouting and gaping of the anus
- Gaping of the vulva in primigravida. The vulva of multiparous will gape even in premature pushing
- Tenseness between the anus and coccyx
- Bulging of the perineum usually means delivery is imminent

Management of the Second Stage of Normal Labour

Can you recall the equipment you will need during the second stage of labour?
You will need a trolley with a top and bottom shelf.

On the top shelf make sure you have:

- Sterile delivery pack
- Small bucket with 0.5% jik for decontaminating instruments
- Bucket with 0.5% jik for decontaminating linen
- A bucket with plastic bag for used swabs and gloves

On the bottom shelf you should have the following:

- Suturing pack
- Antiseptic solution
- Draw sheet and mackintosh
- Syntocinon drawn, in a receiver
- Lignocaine
- 5% dextrose solution 500mls
- Needles
- Branulars
- Syringes (for emergency)
- Sterile gloves

The following steps are suggested in the management of the second stage of labour:

- Explain the procedure to the mother and reassure her

- Ask your assistant to open and arrange the delivery pack while you scrub up
- Gown and glove yourself methodically
- Instruct your assistant to put the patient in the dorsal position
- Swab the mother methodically
- Lubricate your two fingers and perform vaginal examination to confirm second stage
- You should also instruct your assistant to check the foetal heart beat after every contraction, the mother's pulse after every ten minutes and to administer syntometrin after the delivery of the anterior shoulder

Flexing of the head and guarding of the perineum

The Management of the Second Stage of Labour

- Tell the patient to wait for a contraction. When it comes, she should take in a full breath, close her mouth and bear down as strongly as she can, then quickly take in another breath and bear down again.
- She should be able to make at least two efforts during each contraction and relax between contractions. Encourage her all the time and explain the progress being made towards the birth of her baby.
- Place the baby towel on the bed, with the scissors and two forceps for clamping the cord. Prepare two pieces of cotton wool for wiping the newborn's eyes, some gauze for cleaning the airway and for a covering when cutting the cord.
- At this stage the head might start distending the perineum. The anus starts dilating and the head is seen at the vulva. It keeps receding between contractions.
- When the head distends the perineum check if the perineum is stretching well.
- Place the left hand on the advancing head with fingers spread equally over the vertex towards the bregma to stop any sudden explosive effort during and after crowning of the head. With the right hand guard the perineum, holding it with the pad.
- Check if the perineum is stretching. If not, give an episiotomy at the height of a contraction if there is any indication that the head is about to crown.

Crowning of the Head

Next is the crowning of the head. The parietal eminences pass through the bony outlet. At this stage the head no longer recedes between contractions.

Tell the mother to stop pushing as this might lead to a rapid delivery of the head and consequent brain damage. Ask her to pant. Research has shown that a series of short pushes are more effective than a long push. Encourage her as she pushes.

It is really hard work! So keep encouraging the mother with kind words and warmth!

Extension of the head

Assist the extension by grasping the parietal eminences with your left hand. Let the head come out slowly and naturally. Feel for the cord around the baby's neck. If it is there, slip it from the baby's neck over the head. If it is too tight, place two artery forceps on the cord and cut it between them. When the nose and mouth come out, wipe away the mucus with a sterile swab. By this point the whole head should be out.

The head will have restituted and rotated spontaneously to face the mother's left or right thigh. This shows you that the shoulders have descended and rotated to the anterior posterior diameter.

Delivering the Shoulders by Lateral Flexion of the Body

The following procedure should be followed when delivering the shoulders by lateral flexion of the body:

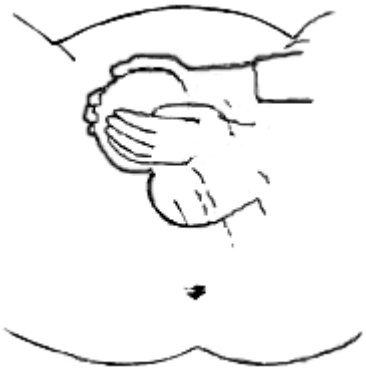
- Place one hand above and one below the foetal head

- Depress the head gently toward the anus/neck, making sure it is neither twisted nor bent sideways till the anterior shoulder is free

The delivering of anterior shoulder

 Remind your assistant to give syntometrine 0.5mg intramuscularly (in a single dose)
 Guide the head upwards in the direction of the
mother's abdomen

The delivering of posterior shoulder



- The posterior shoulder will escape smoothly over the perineum
- The rest of the body will be born by lateral flexion
- Ask your assistant for the time and note the time of birth
- Place the baby at a slight slant to drain the mucous
- Put the baby on the baby towel, clamp and cut the cord
- Give the APGAR score to the baby
- Show the baby to the mother to identify the sex of the baby
- Ask your assistant to continue with the immediate care of the baby
- Continue with the delivery of the placenta by using control cord traction
- Check the placenta for completeness and/or malformation.
- Measure blood loss
- Do the first examination of the baby
- Weigh the baby
- Do a post natal examination and record all the findings
- Give the mother a hot drink and transfer her to the postnatal ward

APGAR Score

Can you remember how to give an APGAR score?

Once the baby is out into the world, your work has just begun. You will need to assess the baby periodically.

After delivering the baby, an assessment of the general condition is done after one minute and again after five minutes. This involves the consideration of five specific signs and the degree to which they are present or absent. The factors assessed are:

- **A**ppearance - Colour
- **P**ulse - Heart rate
- **G**rimace - good grimace
- **A**ctivity - Muscle tone
- **R**espiratory efforts – vigorous crying

A score of 0, 1, 2 is awarded to each of these signs in accordance with the APGAR Score Chart.

APGAR Score Chart

Sign	Score 0	Score1	Score2
Appearance	Pale or blue	Body pink, extremities blue	Pink all over
Pulse/ heart rate	Absent	Less than 100/min	More than 100/min
Grimace	None	Slight	Good
Activity (tone)	Limp	Some flexion/movement	Spontaneous movements/active
Respiratory effort	None	Weak or slow/gasping	Good/vigorous cry

A normal infant in good condition at birth will achieve an APGAR score of 7 to 10. A score of 0 to 3 is severe birth asphyxia and 4 to 6 is moderate birth asphyxia, both of which require immediate resuscitation of the baby.
Immediate Care of the Baby

Clear the airways by sucking mucus from the mouth and nostrils and give oxygen if necessary. Ligate the cord and make sure the ligature is very tight before you cut the cord. Wipe the baby's head and the body and wrap to keep warm. You should record the following information about the baby:

- Label the baby with the mother's name and
  I.P. number
- Write the date and time of delivery
- Sex of the baby
- Birth weight

After handing the baby over to your assistant, you will have to continue to deliver the placenta using control cord traction. At this point you should remind yourself about the process of the third
stage labour.

Principles of the Third Stage of Labour

Mechanism of the Third Stage of Labour
Physiology of Third Stage
Assuming that all the aforementioned factors are well taken care of, you will now look at the physiology of the third stage of labour, starting with the mechanical factors.

The Mechanical Factors

During the third stage, the following mechanical factors come into play:

- The uterus reduces in size 2.5cm below the umbilicus, or 15cm above the symphysis pubis after the expulsion of the foetus
- The contraction and retraction of the uterine muscles continues
- The placental site is reduced to half
- Since the placenta is inelastic, it does not contract, so it detaches from the shrinking uterine wall
- The placenta is pushed further to the lower uterine segment by the weight of the retro-placental clot. This is the accumulated blood from the separated placenta
- With the next contraction the placenta is pushed into the vagina and expelled

You will know that the placenta has separated and has been expelled from the upper uterine segment into the lower segment or into the vagina when you have noted:

- Elongation of the cord which does not recede on pressing at the symphysis pubis
- A gush of blood
- The uterus contracts like a cricket ball.

The placenta is expelled either with maternal side exposed, known as the Mathew-Duncan method or the foetal side exposed known as the Shultz Method.
Click here to view the Mathew Duncan method.
Click here to view the Shultz method.

Control of Bleeding
The following steps should be taken to ensure the control of bleeding:

- The uterine muscle's contraction and retraction causes the placental site to reduce into half. Criss-cross fibres control bleeding by compressing the blood vessels. These fibres are also known as 'living ligatures'
- Clotting of blood takes place in the sinuses sealing the bleeding points a few hours later when uterine contractions are less vigorous.

The time interval between the delivery of the baby and delivery of the placenta is a dangerous period, in which one of the greatest complications of pregnancy and labour can occur.
This complication is excessive bleeding or postpartum haemorrhage (PPH). You should never leave the mother alone even for a short while during this stage.
The third stage of labour can be managed either passively or actively. You will now study each of these two modes of management in detail.

The Passive or Natural Method of Managing the Third

Stage of Labour
The passive or natural method occurs naturally, that is without any interference. For example, in a normal delivery, if oxytoxic drugs are not used, the uterus generally remains inactive for a few minutes after the delivery of the baby, after

which regular contractions then begin again. Physiology of the third stage takes place, the placenta is expelled and bleeding is controlled.

Giving Oxytocic Drugs

Oxytocin, ergometrine or syntometrine stimulate uterine contraction. Ergometrine 0.5mg given IM causes a uterine contraction to occur five to seven minutes after the injection. Given intravenously it acts within 45 seconds. Syntometrine is a mixture of oxytocin and ergometrine 0.5ml given IM acts within two to three minutes. Usually sytrometrine is given with the delivery of the anterior shoulder while ergometrine is given at the crowning of the head.

Controlled Cord Traction

The uterus must be firmly contracted before this method can be used. It is not necessary to wait for signs of placenta separation. Place the left hand above the symphyis pubis, push the uterus upwards and backwards with the right hand and pull the cord downwards and outwards. Apply traction steadily without jerking, see the illustration on the right. When the placenta is visible at the vulva, direct the cord upwards. The placenta will follow the curve of the birth canal. Receive it with both hands and rotate the placenta. This will twist the membranes. You can then deliver the membranes with up side movements, which enable them to be drawn out without breaking.

Maternal Effort

This method is not commonly used. When the placenta has separated and descended, the palm is placed downwards on the mother's abdomen to provide a backup that the mother can push against. During a contraction, the mother should be asked to push down. The placenta will be pushed out of the vagina. This method is useful in the event of a macerated birth

Do not apply downward fundal pressure while doing cord traction as this can lead to inversion of the uterus.

The other method that can be used to deliver the placenta is the fundal pressure method.

Fundal Pressure

This method should be used in case of a macerated or pre-term baby as the strength of the cord is reduced. You should wait for the following signs of placental separation:

- The fundus feels hard like a cricket ball
- There is a gush of blood due to placenta separation
- The cord lengthens and doesn't recede with pressure on the symphysis pubis

Procedure

Make sure the bladder is empty. Instruct the mother to breathe through an open mouth slowly and quietly. When there is a contraction, grasp the uterus with your left hand fingers behind the uterus. Thumb in the anterior surface. Apply pressure to the pelvic inlet in downward and backward direction. Receive the placenta with both hands. If the membranes do not slip out, turn the placenta around and deliver the membranes slowly with an upward movement. Rub the uterus and expel the clots.

Once the placenta is out, you will need to examine the birth canal.

- Explain to the mother that you need to check if she has any tears, warn her it will be a bit painful but the worst part has passed, you will be very gentle and quick and that she needs to cooperate
- Change the gloves, roll gauze over pointing and middle fingers of the right hand
- Insert middle fingers of left hand facing upwards pushing the upper vaginal wall
- With the right hand press down the lower vaginal wall exposing the cervix
- Check the cervix for bleeding, oedema or tears
- Check for any tears with the two fingers of your right hand, mop both sides of the vaginal wall, finish with the fourchette
- Reassure the mother in case there is any tear for suturing
- Cover the perineum with the folded pad into a half
- Wipe the buttocks from the fourchette towards the rectum cover the perineum completely
- Collect any blood loss from the bed
- Change the bed linen with the help of an assistant
- In case of episiotomy or a tear, scrub your hands while your assistant is

setting a sterile suturing pack and repair the tear
- Ask the mother to lie on her back with her legs crossed on each other
- Ask the assistant to hand over the baby to the mother
- Leave the mother to rest while you go to examine the placenta

Procedure
Write down any reasons you can think of, for examining the placenta.

You now know why we examine the placenta. But how do you go about it?
The Fourth Stage of Labour

The fourth stage starts after the delivery of the placenta and lasts for one hour. The nurse or midwife should observe the mother for blood loss, monitor vital signs, reassure her and let the mother hold the baby. The nurse should also record notes in the patients file, fill in the baby notification form and after the hour is over escort the mother to the maternity unit.

Examination of the Baby

As mentioned earlier, once the baby is delivered, a thorough first examination is done. Can you remember at what time interval?

A thorough physical examination is done one hour after birth with the aim of assessing maturity and excluding obvious congenital abnormalities and injuries at birth. In order to carry out this examination, you need to have with you the following equipment in a tray:

- Tape measure
- Second hand watch
- Gloves
- Weighing scale
- Clinical thermometer
- Lubricant
- Swabs
- Stethoscope

Examine the baby systematically in the following manner:

- **Vital signs** - heart rate (120-160/min), respiration (20-60 average 44/min), and temperature (36-37 degrees centigrade).
- **Head** - Check the shape to see if there is excessive moulding, caput succedaneum or depressed fractures to exclude head injury, microcephalus or hydrocephalus. Take head circumference (Approximately 33-37 cm).
- **Ears** - Check position. If they are low set, this may indicate Down's syndrome or Mongolism. Check for any missing lobes or cartilage.
- **Eyes** - Check for presence of eyeball injuries, discharge or jaundice.
- **Mouth** - Check for harelip, cleft palate, tongue-tie or false teeth, septic spots, thrush, cysts.
- **Nostrils** - Check for patency with no polyps or flaring.
- **Neck** - Check for congenital goitre or enlarged glands.
- **Upper limbs** - Check for equality, free movement, fractures, webbed fingers, extra digits and any bony tissues. Extra digits can be ligated with silk and will fall off (with the parents permission). Check for Erb's palsy.
- **Chest** - Check for continuity of sternum and the shape of rib-cage, respiratory rate, enlarged breast or absence of breast tissue .
- **Abdomen** - Should be intact and firm, check for umbilical hernia and exomphalus (protrusion of abdominal organs through a defect in the anterior wall). Abdominal distension is present in hydrops foetalis. Check for blood oozing from the cord and clamp again if necessary (cord shrivels within 24 hours, falls off 6-10 days).
- **External genitalia** - Confirm the sex of the baby to rule out pseudo-haemophrodism or intersexes. In males check for undescended testes, hypo/hyperspadias and phimosis. In females, check for bleeding from urethral and vaginal orifice. Vaginal bleeding may be due to excessive hormones from the mother

Neurological Assessment

This entails the checking of reflexes, which deal with the function of the baby's nervous system as well as physical and behavioural assessments. At the beginning of the examination, observe the baby's movements. These movements involve all extremities and should be random and symmetrical but never stereotyped. Sometimes jitteriness or tremors will be noted. The first time you notice these movements they may look like fits. To determine the difference between the two, hold the affected limb. If it is the former the tremors should stop.
Neurological assessments include the following, click the links to reveal the details of each:

Moro Reflex

Support the baby's head and body in supine position about a centimetre from the cot. Allow the head to drop back. Look at the baby's response. The baby throws out his arms extending the elbows and fingers with embracing movements of the arms. What is the significance of the Moro reflex?
The Moro reflex is symmetrical in a normal baby at birth and disappears after three months. It is incomplete in the pre-term baby and absent in the baby with inter cranial drainage. If brain damage is not severe it returns after three to four days. If it disappears some hours after birth, you should then suspect increasing cerebral oedema or slow intra cranial haemorrhage.

Tonic Neck Reflex
A fencing position is assumed, that is, the baby lies on the back, head rotated to one side with one arm and leg partially or completely extended. The opposite arm and leg are flexed. This is a manifestation of the immaturity of the newborn's nervous system.

Rooting Reflex
To test for the rooting reflex, gently touch the corner of the baby's mouth with clean fingers. The baby will open his mouth turning towards the stimulus in anticipation of the mother's nipple. To check for sucking reflex place a clean finger in the baby's mouth noting the sucking strength. The sucking reflex is poor in pre-term babies.

Stepping Reflex
The stepping or dancing reflex is present at birth but disappears soon after. Once this reflex diminishes, the infant does not attempt a stepping motion until he/she starts to walk. Hold the infant up, with the feet touching a surface. The infant will attempt to make some steps or pressing movements.

Grasp Reflex
It is amusing to learn that a newborn baby can grasp. At birth, the grasping reflex of both hands and feet is present. The infant will grasp any object you place in their hand, and then let it go. They are able to hold on to a finger so securely, that you can lift them to a standing position. Stroking the soles of the feet causes the toes to turn downwards trying to grasp. By applying traction to the baby's wrists raise them to a sitting position. A full term infant will offer a strong resistance while a pre-term does not resist the pull.

Protective Reflex
Other reflexes include protective reflexes such as:

- The blinking reflex, which protects the eyes from bright light
- Sneezing and coughing reflexes used to clear the infant's throat
- The yawn reflex, which draws additional oxygen
- Cry reflex, which helps to withdraw from painful stimuli

All of these reflexes either diminish or strengthen as need be, influencing behaviour patterns, which become more complex.

Once this examination is completed, the baby can be placed on the cot for transfer to the nursery or given to the mother.
After completing the delivery of the baby, you should transfer the mother to the postnatal ward where she will rest.

Physiology of Third Stage
What changes take place in a woman who has just delivered during puerperium?
The puerperium period covers six to eight weeks following delivery or abortion and is characterised by:

- General organs return to their pre-gravida state
- Initiation of lactation
- Recuperation

Have you talked to friends about how they felt during their puerperal period? You will be surprised! Some say that whenever the midwife asked them any questions, they felt irritated for no good reason. Others felt like crying when their partners were late to visit. Some felt like screaming when the baby cried and wanted to cover it with a pillow to suffocate the innocent precious baby!

The Psychology of the Mother During Puerperium
During the puerperium the mother is subjected to emotional turmoil and you must be supportive and observant. She should be allowed to cuddle her baby and express her love as she wishes. This maternal instinct is at times delayed.
The midwife should be kind, patient, and compassionate towards the mother and give her the necessary education concerning her and the baby. Each mother should be taken as an individual based on her maternal experience, educational background, maturity and parity. Mothers should be given all the information necessary to ensure they know how to care for their babies.
Rooming is the term given when a hospital plans for the mother to stay with the baby for most of the 24 hours in a day. It is highly recommended because it has been seen to have great psychological advantages for both mother and baby. Bonding commences immediately and demand breast-feeding can be successfully practised. Most baby-friendly hospitals in this country encourage rooming in.
Postpartum Tears or Fourth Day Blues
This condition is characterised by mild depression and mood swings due to a temporary endocrine hormonal imbalance following childbirth. It occurs in fifty percent of post-natal mothers on around the fourth day. A midwife should try to prevent the 'blues' by educating the mother during the pre-natal period on how to take care of herself and the baby to build up her confidence. Involve the partner in these teachings so that the partner can give moral support. Teach the mother how to check for minor discomfort and the relevant remedies to reduce the feeling of anxiety that the baby is ill whenever they cry.
It is a time of great physiological change, accompanied by some anatomical and psychological changes as well. This is a time of change in the body in general with the exception of the breasts.
The breasts continue to develop so as to establish and maintain lactation.
The other changes that take place in the mother are outlined on the following pages.

General Involution
Every system in the body is affected during this process, including the heart and circulatory system. With the cessation of the utero-placental circulation, the work done by the heart decreases. The quantity of blood required also gradually returns to normal. The renal and musculo-skeletal systems also return to normal.

Involution of the Uterus
The size of the pregnant uterus is 30 x 22 x 20cm and it weighs 100gms at the end of labour. It is 15 x 11 x 7.5cm by the end of puerperium. Involution takes place, by which point it measures 7.5 x 5 x 2.5cm and weighs 60gms. Involution is the return of the uterus to its normal size, position and tone and is brought about by autolysis
and ischaemia.
Autolysis is a process by which muscle fibres are digested by the proteolytic hormone. The muscle fibres have to dissolve a large amount of their protein in order to achieve this reduction in size. This means that a great deal of nitrogen is excreted by the body in the urine together with the excess fluid retained during pregnancy. This is why a lot of urine containing large amounts of nitrogen is excreted during the first few days after delivery. In addition, the epithelial lining of

the uterus, other cellular debris, and red blood cells are expelled as lochia from the uterus.
Ischaemia is localised anaemia of the uterus, which occurs when the placenta is expelled. Blood vessels are constricted, which results in the reduction of the blood supply to the uterus. The phagocytes dispose of the redundant muscle fibre and elastic tissue. The vagina, ligaments of the uterus and muscle of the pelvis also return to their pre-gravida state. If not, prolapse of the uterus may occur later.

Onset of Lactation

Lowered oestrogen levels trigger the production of prolactin from the anterior pituitary gland, which initiates lactation. The maintenance of lactation depends on putting the baby on the breast, but secretion of milk commences on the third to fourth day. The baby should be put on the breast immediately, which leads to oxytocin release and assists in keeping the uterus well-contracted. (You should revise the anatomy and physiology of the breast in unit one).

Management of Normal Puerperium
The aim of managing the puerperium is to:

- Maintain the mother's good health
- Aid involution of the pelvic area
- Promote breast-feeding
- Prevent infection and other puerperium complications
- Educate the mother on the proper care of her own health and the baby

The mother and the baby should be examined daily and if any abnormality is noted, the doctor should be informed. When noting the mother's general condition, you should check for the following points:

- Assess happiness, sadness, worries and fears and address them appropriately.
- Ambulation is important to prevent deep venous thrombosis.
- Take her temperature, pulse, respiration and blood pressure twice daily.
- Check the breasts and if she is not lactating,
  express colostrum.
- Increase expressing on the second day and milk should be established on the fourth day.
- Advise the mother on how to feed the infant. When fixing the baby on the breast she should put the whole areola in the baby's mouth.
- She should initially breast feed the baby for three minutes to prevent cracked nipples and empty the breast in cases where the baby does not feed a lot. This is especially important in the first days to prevent engorgement.

Measure the fundal height and record the measurement daily. Assess whether the involution is taking place satisfactory. The fundal height should reduce by 0.5 - 1 centimetre daily.
Check on lochia loss, noting the colour. This should change as per the schedule we noted earlier. If there is persistent red lochia, this points to the need for further investigation. Offensive lochia odour denotes infection.
You should also check the perineum to see if there was episiotomy and note its state. Advise the mother to wash the episiotomy at least four times a day with salt water and change the pad as soon as it is soiled and after she goes to the toilet.
Check on the calf muscles and exclude any pain that may indicate deep venous thrombosis. You should also exclude oedema and anaemia. Ensure that the mother gets enough sleep and rest. If she cannot sleep, she should be given a sedative.

Take note of any pain and administer analgesics. Ask the mother to report if lochia is heavy. Also encourage her to pass urine when her bladder is full. Encourage her to continuously check on the baby's cord and to report any bleeding, especially in the first 12 hours.
Measure the fundal height and record the measurement daily. Assess whether the involution is taking place satisfactory. The fundal height should reduce by 0.5 - 1 centimetre daily.
Check on lochia loss, noting the colour. This should change as per the schedule we noted earlier. If there is persistent red lochia, this points to the need for further investigation. Offensive lochia odour denotes infection.
You should also check the perineum to see if there was episiotomy and note its state. Advise the mother to wash the episiotomy at least four times a day with salt water and change the pad as soon as it is soiled and after she goes to the toilet.
Check on the calf muscles and exclude any pain that may indicate deep venous thrombosis. You should also exclude oedema and anaemia. Ensure that the mother gets enough sleep and

rest. If she cannot sleep, she should be given a sedative.

Take note of any pain and administer analgesics. Ask the mother to report if lochia is heavy. Also encourage her to pass urine when her bladder is full. Encourage her to continuously check on the baby's cord and to report any bleeding, especially in the first 12 hours.

Can you think of any minor and major complications of puerperium?
Major Complications

- Venous thrombosis
- Pulmonary embolism
- Retention of urine or retention with overflow
- Urinary tract infection
- Puerperal sepsis and pyrexia
- Engorgement of the breasts
- Cracked nipples or mastitis
- Puerperal psychosis

Minor complications

Post Natal Examination

This is carried out during the sixth post-partum week. You should inquire about the general health of the mother and baby. You should also do a haemoglobin estimate and if you find that it is low, embark on treatment.
You should inquire and note any gynaecological symptoms. Examine the mother's general condition, with specific emphasis on the breasts. Find out if the breasts are active. Examine the abdomen for tone of muscle and any masses. Also examine the vulva and vagina to ascertain the healing of the repaired episiotomy or tear. Pass a speculum (sims) to see the state of the cervix and if there is any discharge. Do a Pap smear at this stage. If possible, you should carry out a bimanual examination of the uterus to ascertain that the uterus has involuted to its normal size. Finally, remind the mother of the various family planning methods discussed and re-emphasise the importance of attending maternal and child health clinics**.**

SECTION 2: THE NEONATE

Introduction

In this section you will focus on the new life, that is the neonate, who is now an independent being outside the mother's womb.
'Neo' means, new, hence the term 'neonate' means newborn.
The neonatal period is the first four weeks after birth. A neonate can be classified as, preterm, full term or post term.

Objectives

By the end of this section, you will be able to:

- Describe the physiology of the neonate
- Explain the care of the neonate
- Describe the management of the high risk neonate
- Describe the management of a neonate with
  abnormal conditions
- Describe the management of neonatal emergencies
- Describe the management of birth traumas
- Describe the management of congenital abnormalities

Physiology of the Newborn

Knowledge on the physiology of a newborn is necessary to ensure appropriate care of the neonate. In the first section of this unit, you learnt about the management of the second stage of labour and the examination you should carry out on the newborn baby.

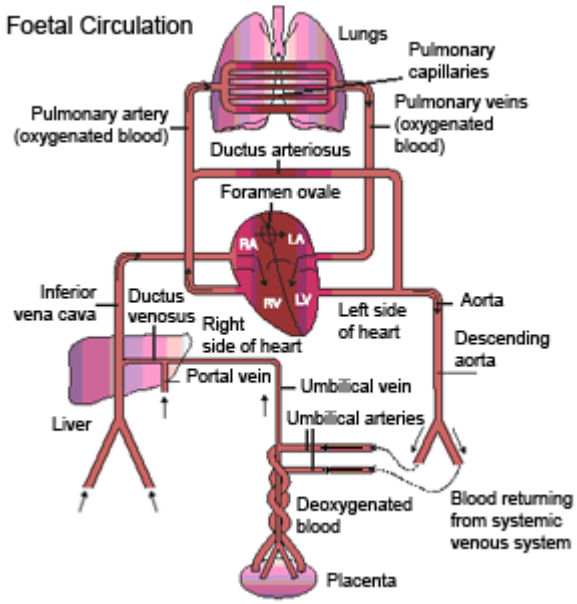
Try to think of three main physiological adjustments in a neonate at birth.
Immediately at birth, there are three main adjustments that take place involving the lungs, the cardiovascular system and the temperature regulating centre to allow for the independent existence of the newborn baby.
You will now look at each of these adjustments in turn starting with those involving the respiratory system.

Changes in the Lungs
The onset of respiration in a newborn confirms life. The start of pulmonary respiration is due to physiological and mechanical reasons. Lack of oxygen and high levels of carbon dioxide in the

circulation occur when placental circulation ceases. This stimulates the respiratory centre in the medulla to initiate normal respiration.
Mechanically, respiration is stimulated when the chest wall, which was compressed during the passage of the baby in the birth canal, allows the fluid to drain from the lungs. Consequently, the cool air on the baby's face and handling during birth will stimulate the baby to cry as soon as they are born. After the baby takes in their first breath, the blood vessels in the lungs expand to initiate respiration.
At first the baby's breathing may be rapid and irregular. It is mainly abnormal at a rate of 40 - 50 respirations per minute.

Circulatory Changes
You will recall that in unit two you studied foetal circulation. If you have forgotten what you covered, please refer to that section again. In summary, you noted that:

- Foetal type of circulation ceases as the respiration commences
- Normal circulation starts when the temporary structures stop functioning



What are the four temporary structures in foetal circulation?
I hope you thought of the following structures:

- Foramen ovale
- Ductus arteriosus
- Ductus venosus
- Umbilical vein and hypogastric arteries

As the placental circulation ceases soon after birth when the umbilical cord is ligated, the blood flow to the right side of the heart decreases and the blood on the left side increases causing the foreman ovale to close.
With the establishment of pulmonary respiration, the ductus arteries close. Complete closure happens within eight to ten hours of birth.
The cessation of placental circulation will result in the collapse and subsequently drying of the umbilical veins, the ductus venosus and the hypogastric arteries.

Remember:
Persistence or reopening of the ductus may occur if pulmonary vascular resistance is high. Cyanosis or cyanotic attacks will be evident as a result. This is a common problem of preterm neonates with Respiratory Distress Syndrome.

Anatomical closure by fibrous tissue occurs within two to three months, resulting in the formation of the ligamentum teres, ligamentum venosum and obliterated hypogastric arteries.
Cardiopulmonary adaptations, which take place at birth, are interdependent. This means that failure to establish respiration and satisfactory tissue oxygenation presents a life threatening situation to the neonate.

Thermo (Heat) Regulation
The neonate leaves a thermo constant environment
of 37.1 degrees Celsius, where they have survived
for nine months and enters a much cooler atmosphere at delivery. This affects the neonate in
various ways.
Firstly, heat regulation in the neonate is poor because of their inefficient heat regulating centre.
The subcutaneous fat layer of the neonate is thin and
provides poor insulation, allowing the transfer of core
heat to the environment and also cooling of the baby's blood. In addition to evaporation, further heat
will be lost by conduction when the baby is in contact with cold surfaces, by radiation to cold objects in the environment and by convection caused by currents of cool air passing over the surface of their body. Incidences of the latter may be substantially increased by air

conditioning systems in some of our modern delivery rooms. Since the neonate's temperature regulating centres are not very efficient, there is a risk of either overheating or chilling.

Other Physiological Changes In a Newborn
In addition to the three physiological changes discussed above there are other changes that occur as described below.

Liver Function
Physiological jaundice is usually seen in 50% of normal neonates from the third to the sixth day of life. This is due to excessive break down of red blood cells resulting from a high haemoglobin level (Hb of 14 - 18mgs/100mls).
The process of breaking down red blood cells leads to formation of bilirubin. The liver is not able to conjugate the excess bilirubin to enable its secretion through the kidneys. This leads to jaundice. You will see more details on conjugation later in this section.

Digestion
The neonate is capable of passing the first stool, known as meconium, within the first two to three days of life. This is because the foetus swallows liquor amnii in utero. Thus, their sucking and swallowing reflexes are usually present at birth.
The colour of the meconium is dark greenish and later changes to a mustard (yellowish) colour. The bowels may be opened three to five times daily.

Weight
The average normal birth weight ranges from 2.5 - 3.5 kilograms. During the first three days of life, the baby loses approximately 10 - 20% of their birth weight but regains it again within one to
two weeks.

What are two possible reasons for weight loss in a newborn?
Your answer should include the following:

- Due to tissue fluid loss during the heat loss when the baby is born
- When the baby opens their bowels, the meconium which was present in the gut is lost, leading to weight reduction
- Poor sucking on the breast due to tiredness incurred during the baby's passage through the birth canal during labour will affect the baby's weight since they are not getting enough fluid intake

Skin
The skin of a newborn is covered with vernix caseosa in utero to protect and help retain heat and also act as a lubricant during delivery.
The sebaceous glands cease to produce vernix after birth, which may lead to dryness of the skin. The vernix caseosa will peel off within three days of delivery if left alone. There is also plenty of fine hair (lanugo) on the skin which falls off in the first month of life.

Care of a Newborn

Neonatal care is designed to provide an environment conducive to the well being of the baby and to prevent complications.
As a midwife, you should realise that the neonatal period is a very hazardous period. Statistics show that two thirds of infantile deaths occur in the neonatal period. More than half of these deaths occur in the first 48 hours and three quarters in the first week of life.
Therefore, the midwife's responsibility is to minimise these deaths through efficient management of the infant.

Immediate Care of a Newborn

During the delivery of the baby's head, excess mucus may be wiped gently from the mouth.
Immediately the baby is born, they should be held slanting with the head at a lower angle for a short period to allow drainage of mucus and liquor amnii, which may have been swallowed.
The baby is stimulated to cry in order to take its first breath (refer to the discussion on management in the second stage of labour).

Remember:
Gentle handling while stimulating the baby to cry during delivery is essential. The practice before was to hold baby upside down and vigorously hit the soles of the feet. However, this causes injuries to the internal organs and also means a lot of pressure is applied to the chest cavity because all organs gravitate down when the baby is held upside down.

How to hold a newborn after birth

How not to hold a newborn after birth

The baby is laid across the mother's abdomen as the cord is clamped, ligated and cut. The timing of the clamping of the cord is not crucial unless asphyxia, prematurity or rhesus incompatibility
is present.
Wrap the baby with a towel and place them in a warm cot with their head to one side. The head should be lower than the body in order for the secretions to drain and not block the airway. Ensure that the baby has an identification wristlet, which should be put on before the baby leaves the delivery couch/bed.
Leave the baby to rest for an hour in order to recuperate from the strain of labour and birth. Frequent observations should be made during this period to ensure that the baby's respiration is normal, and that they are not bleeding or haemorrhaging from the cord.
The first examination of the newborn is performed after one hour.
Assessment of the newborn is done by scoring at one minute after birth. Repeat at five minutes and then ten minutes. This is known as the APGAR score. Can you remember how to score the baby?

Try to write down four vital signs that are assessed in the APGAR scoring
In 1953, Dr Virginia Apgar designed a chart which gives an index of the infant's degree of depression (if any) at birth, determining their need for help through five easily observed signs: heart rate, respiratory effort, muscle tone, reflex response, and colour.
These five vital signs are each given a score of 0, 1 or 2 points.
Each vital sign is represented by a letter, forming the word APGAR that is:
A Appearance A Activity
P Pulse or apex beat R Respiration
G Grimace
Have a look again at the table from section one, which shows how a score is awarded.

A normal baby has an APGAR score of ten at one minute and ten at five minutes. A score between seven and ten is considered to be normal. Approximately 70% of newborns score seven or better.

Sign	Score 0	Score 1	Score 2
Appearance	Blue, pale	Body pink, extremities bluish	Pink all over
Pulse/heart rate	Absent	< 100/min	> 100/min
Grimace	None	Grimace	Cry
Activity	Limb	Some flexion	Spontaneous movements
Respiration	Absent	Hypoventilation/gasping	Vigorous crying

Remember:
A score at five minutes gives a more accurate prediction regarding survival. A low score at five minutes is, therefore, more serious than a low score at one minute after birth. Notify paediatrician if score is six or below at five minutes.

Subsequent Care

You need to be familiar with the daily management of a neonate and what nursing activities are undertaken.

Try to list the principles of daily care of a neonate.

The principles of management of the neonate include:

- Maintenance of the established respiration
- Provision of nutrition
- Prevention from infection
- Provision of warmth
- Protection from injury
- Assessment of the progress of the baby
- Education of the mother as to the further care and management of the baby

You will now go through these principles in more detail.

Maintenance of the Established Respiration

A normal baby should continue to breathe and maintain a good skin colour without medical intervention.

A baby who tends to produce a lot of mucus should be closely watched and the airway cleared frequently, because this may tend to interfere with breathing by blocking the airway. The head of the cot should also be lowered in such circumstances. Measures should be taken to avoid suffocation from the pillow, clothes covering the baby or mother lying over the baby.

Provision of Nutrition

Breast feeding is an accepted and ideal means of providing nutrition to a neonate. The neonate should be put on the breast immediately, as long as their condition allows this. Demand feeding (baby led breast feeding) is ideal and should be advocated. Encourage the mother to breast feed exclusively in order to avoid the need for the addition of other fluids. The mother's milk has adequate water to meet the needs of the infant. Therefore, there is no need to give the baby additional fluids (contrary to the belief of some mothers that babies require water).

To ensure that the baby gets both fore and hind milk, the mother needs to breast feed the baby on one breast until completely empty. This ensures that the baby has all the nutrients, because foremilk contains proteins and hind milk is high in calories. Bring up wind before offering the second breast to the baby. If the baby is not able to suckle the second one until it is completely empty, then the mother is advised to express milk, in order for fresh milk to be released to the breast. The nipples should be cared for to avoid complications such as sore nipples that will affect the baby's breast feeding.

Provision of Warmth

The baby should be kept at a comfortable temperature. Care should be taken not to overheat the baby, as is sometimes the habit of mothers.

Mothers in the tropics, for instance, often tend to overdress the neonates. Mothers should be taught about appropriate clothing for varied climates. They should dress the baby according to the change of environmental temperature.

Baby wraps should be loose enough to allow for free movement of the legs and arms.

Protection from Injury and Infection

Injuries may be inflicted by the long nails of the mother, midwife, the baby itself, or sharp instruments, for example, the safety pin used to secure nappies. Injuries from falls, scalding and burns are not unusual.

The midwife should instruct the mother on how to handle her baby, and teach her how to wrap napkins without using safety pins. She should also be instructed to keep her nails short.

Prevention from Infection

Infection, especially cross infection, can be minimised by encouraging mothers to handle their own babies. Anybody in contact with the child should be encouraged to wash their hands before handling the baby.

Visitors should be controlled, especially in a lying in ward. This helps control infection. Midwives or other attendants with a cold or infections foci, should not work with babies. Babies born at home should be nursed indoors, away from visitors for the first eight days.

Immunisation should be administered to protect the neonate from certain preventable diseases. BCG and oral polio should be given within the first 24hrs after delivery. One of the advantages of breast feeding is that it protects the baby against childhood diseases since the breast milk is rich in immunoglobulins.

The cord is one of the sources of entry for micro-organisms in an infant. The aim of cord care is to prevent haemorrhage, while getting the cord to dry up and separate. To this end, you should check on the cord hourly, because bleeding may occur if the ligature slips off or as the Wharton's

jelly shrinks. This is why a thick cord is more likely to bleed. If there is bleeding, then it should be legated.
The cord should then be observed more closely.
The cord is best left exposed and mothers should be advised not to use any remedies on the cord since it predisposes to infection. The midwife should discourage mothers from touching the cord.
When the dry cord breaks off, it may leave a raw area. This should be cleaned with spirit and dressed with 1% Gentian violet. Use spirit because it leaves the site dry. Other antiseptics leave the place damp, making it ideal for the multiplication of micro-organisms.

Remember:
If the cord fails to drop off by the sixth day, it may mean that there is an infection.

Skin Care
The neonate's skin is fragile and easily bruised. Therefore, irritants such as antiseptics, fabric softeners and starch are discouraged.
Creased hard fabrics, stool and urine may interfere with the skin integrity. To prevent damage to the baby's skin, liquid paraffin preparations may be used because they serve as good cleansers.
Remember:
You should report any abnormalities observed on the umbilical stump such as redness, unpleasant odour or bleeding because these are signs of infection.

Assessment of Baby's Growth

The midwife should be able to determine that the baby is healthy and thriving. A baby who is healthy and is growing is active, feeds well, is free from infection and gains weight steadily. In order to observe these, it is necessary to examine the baby thoroughly at least once a day during bath time.
The following daily observations should be recorded in order to determine the baby's health status:

- General appearance and activity
- Exclude any discharge from the eyes and ears which may be an indicator of infection
- The skin should be checked to detect the presence of jaundice, pallor or cyanosis, septic spots or sore buttocks
- Check the mouth to exclude oral thrush
- The umbilical cord should be examined to ensure that it is drying up and is not septic
- Weigh the baby to determine weight gain

Other general care measures include:

- Observations, especially on respiration
- Feeding patterns
- Crying
- Urinary output
- Character of stool

Depending on what is observed, document and report to the doctor if necessary. In this way, abnormalities will be detected and corrective measures taken early enough.

Education of the Mother

This should start during the antenatal period. Emphasis should be laid on the following:

- Personal hygiene and general cleanliness
- How to care for the baby (especially for the primigravidae)
- Exclusive breast feeding
- Attendance of post-natal clinic, family planning and infant welfare clinics

You have now come to the end of the subsection on the normal neonate and how to manage them. This started with immediate care then subsequent care. The health or well being of the neonate depends on how the environment has been modified for its survival.
In the next subsection you will focus on high risk neonates. Some of the conditions you are going to cover include circumstances you may meet in the labour ward, post-natal ward or newborn unit. The neonate may not be sick but it may be at a potential high risk both physically, psychologically and socially.

The High Risk Neonate

In this subsection, you will begin looking at neonates at risk. You will then move on to neonates found in abnormal circumstances, for example, babies born before their due date and those who are abandoned.
Usually, maternal conditions may predispose a neonate to be at high risk of developing the disorders you are about to cover. The high risk groups of neonates require early diagnosis so that the disorders can either be prevented or appropriate measures instituted early enough.

Classification of High Risk Neonates

Try to list at least five types of high risk neonates due to maternal conditions.
You should have included the following:

- Low birth weight (this category includes babies weighing less than 2500gm regardless of the estimated period of gestation)
- Post term babies
- Diabetic infant
- Rh negative mother (see Jaundice)
- HIV/AIDS positive mother
- VDRL positive mother
- Hepatitis positive mother
- Neonatal sepsis

The Premature Infant (Preterm)
A preterm infant is a baby born before the 37th completed week of gestation.
A high percentage of premature births occur with female births and pregnancies with multiple foetuses. This is most often due to the early over distension of the uterus, which leads to the foetus being born prematurely. Premature births also occur more frequently in low socio economic and illiterate groups in the population, largely as a result of the poor nutritional intake of the pregnant mother. Additionally, they tend to be more common when there is concurrent maternal metabolic or systemic disease, for example, hypertension and renal disease.

Try to list two causes of prematurity.
You should note that in many instances the cause of premature birth is not known. However, some of the causal factors are thought to be:

- Multiple births (twins or more), which causes early distension of the uterus hence early birth
- Hypertension associated with the pregnancy leading to early induction of labour, for example, preeclampsia and eclampsia
- Premature rupture of membranes due to physical or psychological stress

Prematurity is also associated with:

- Polyhydramnios which causes over distension
- Trauma leading to premature rupture of membranes
- Chronic infections or diseases in the mother, such as syphilis, tuberculosis, chronic nephritis, cardiac disease, diabetes and thyroid disease, may lead to premature labour
- Acute infections in the mother, like pneumonia, influenza, rheumatic fever and malaria could induce premature labour
- Physical stress caused by non obstetric surgery may lead to premature labour if the mother has this procedure while pregnant
- Congenital malformation of the foetus
- Habitual abortion owing to incompetent cervical OS or uterine malformation

You should remember that premature labour can be prevented.

Prevention of Premature Birth
There are a number of things you can do to prevent a premature birth. Can you remember them? Try to recall what you covered in unit two.

State two ways you can prevent premature births.
One way to prevent premature births is to give early and continued prenatal care with stress on dietary and general hygienic education to the expectant mother. This will also ensure immediate treatment of those complications of pregnancy likely to cause, or be associated with, premature labour.
Sometimes it is also possible to postpone or inhibit uterine contractions in some cases of premature labour through the use of certain pharmaceutical agents such as:

- Those that act by preventing the release or synthesis of a known uterine stimulant, for example, prostaglandin inhibitors, non steroidal anti inflammatory drugs like aspirin, endomethacin, declofenac
- Those that act by the direct effect on the myometrial cells, for example, beta adrenergic receptor stimulants like retodrine, fenoterol, salbutamol

Remember that inhibition of preterm labour is contra indicated in the case of certain conditions, where inhibition may compromise the life of the pregnant woman. These conditions include:

- Eclampsia
- Severe preeclampsia
- Antepartum haemorrhage, especially abruptio placentae

- Chronic renal disease
- Severe chronic hypertension
- Advanced cardiac disease
- Foetal distress
- Chorioaminionitis
- Foetal death
- Foetal growth retardation

Remember:
Inhibition of preterm labour should not be considered routine in all cases of suspected premature labour because it may be detrimental to the mother's or infant's survival.
Other ways to prevent premature birth include:

- Prolonged bed rest should be encouraged, especially where the mother has any of the conditions that predispose to preterm labour
- Use of sedatives during preterm labour to ensure complete bed rest
- Avoidance of strenuous exercise and calming the mother, because any strain or stress may aggravate preterm labour

Remember that there is still a lot more research to be done on causation of premature labour.

Physical Characteristics of Prematurity
Generally the characteristics depend on the gestational age. The generalised description is that the baby may appear pink or dark red, hands and feet may be cyanosed and may be jaundiced early.

Wakefulness
When the infant is awake, the lower extremities are rarely extended. There may be slow prolonged contraction of the facial muscles, quivering movements or transient smiles. There may also be fine movements of the fingers and toes. These may be confused with convulsions but they are not.

Cry
The cry is feebler than that of a full term infant. In fact, a premature infant usually cries very little, if at all.

Skin and Appendages

The skin is covered by a small amount of vernix caseosa. Lanugo is present on the sides of the face and on the extremities and the back. There is scanty hair on the head and the eyebrows are usually absent. The nipples and areola are inconspicuous. The nails are soft.
Generalised oedema is apparent at birth and later the tissue fluid decreases, leaving the skin loose and wrinkled. Blood vessels can be easily seen under the skin because subcutaneous tissue is thin.

Neck and Thorax

The thorax is cone shaped and the rib cage is weak, owing to immature osseous calcification. Obstruction to the free flow of air causes marked sternal retraction, a rapid heart rate and respiratory noises. Occasionally, cardiac murmurs are heard. A change in position may cause periods of apnoea. Very small infants will not open the mouth to breathe. The nose should therefore be checked for occlusion frequently.

Favourable Prognostic Signs

The premature neonate has a higher chance of survival if:

- Birth weight is more than 1500g
- There is no persistent cyanosis and there is some activity on stimulation
- Gagging and swallowing reflexes are fairly active
- Skin is not wrinkled and subcutaneous fat is present
- Body temperature is stable
- There are no signs of abnormal conditions such as jaundice, pallor and/or sternal retraction

Management of a Premature Baby

Management of a premature infant

- Avoid depression of the foetal respiratory centre
- Sedatives of opium derivatives should not be used during premature labour
- Shorten the perineal phase during delivery of a preterm baby by performing an episiotomy. As this will reduce the possibility of intracranial injury
- Transfer a woman in premature labour to a well equipped hospital for adequate resuscitation and care of the premature infant

Care of a premature infant

The efficient care of the premature infant is equally
important. You should take the following steps:

- Clear the airway using a fine mucus extractor/catheter
- Administer oxygen at 1 litre per minute till respiration is well established and colour is satisfactory
- Put the infant in an incubator or cover with warm towels and transfer to a special baby care unit as soon as practicable
- Ideally infants weighing less than 2 kilograms that have been delivered in a health centre or in the home should be transferred to a well equipped hospital with nursery for baby care

Remember:

Incubators may be lacking in some the healt facilities. The midwife must,therefore, learn to improvise on how to keep the baby warm.

Further management aims of a premature infant

Once immediate steps have been taken to ensure the well being of the premature infant, further management aims at:

- Maintenance of respiration and good colour
- Provision of warmth
- Prevention of infection
- Ensuring good progress and growth
- Educating the mother to take care of her infant
- Ensuring baby gets adequate nutrition

Maintenance of Respiration of the Preterm Baby

You should assist in the establishment of respiration since the respiratory centre in the medulla is immature. The lungs tend to be atelectatic and are not well developed due to inadequate surfactant. The diaphragm and chest muscles are weak, therefore, the baby is constantly asphyxiated. This means that the airway should be repeatedly cleared. The infant should be laid with its head to one side and the foot of the cot should be slightly raised to aid with the drainage of mucus. You should also watch the infant closely for signs of respiratory distress and cyanosis.

Remember:

Respiratory distress can be recognised by the rapid, irregular respiration with periods of apnoea, in-drawing of the chest walls and sternal recession and expiratory grunt with cyanosis of body and face.

Give oxygen in such cases (avoid high concentrations of oxygen) to the premature infant. The recommended dosage is 30 - 40%. Note that prolonged administration of a high concentration of oxygen may lead to the development of fibrous tissue behind the lens, which results in a condition known as retrolental fibroplasia leading to blindness in the newborn.

Provision of Warmth and Maintenance of Body Temperature

The midwife should do her best to ensure that the baby's temperature is prevented from reaching very low levels. Remember that the heat regulation centre in premature babies is underdeveloped. Small babies weighing less than 1.5 kilograms should ideally be nursed in an incubator with temperature of about 30 degrees Celsius and relative humidity of 65%. If there is no incubator available, they should be nursed in warm towels (which may be warmed with hot water bottles). You can also make an improvised cot out of a wooden box raised off the floor where there are no cots.

Remember:

Use of cotton wool as a means of keeping infantwarm has been condemned, since it deprives the skinof air and there is danger of infection and overheating of infant.

Loose flannel clothing is recommended for infants nursed in cots (woollen material may cause a skin rash and is also cumbersome). The infant should not be exposed to direct sunlight. If the premature infant can maintain its body temperature at 36 degrees Celsius, its condition is likely to improve and it may be weaned off the incubator.

Feeding

Breast milk is ideal because of its digestibility, nutrients and the immunity it gives to the newborn. The practice of withholding feeds or fluid for 24 hours or more before feeding is considered unnecessary.

If the stomach content is aspirated before the first feed, regurgitation and inhalation of

stomach contents are not likely. The first feed should be small and ideally given per tube.
Five percent glucose water may be given, which has the advantage of counteracting acidosis and provides fluid and energy.
If the infant can tolerate it expressed breast milk should be offered next. The amount of feeds given depends on the size of the infant and its tolerance levels. However, 10mls is usually offered for the first few feeds. Infection control and prevention measures are highly recommended with regard to handling expressed milk.
Artificial milk, that is half strength cow's milk, lactogen and so on, may be resorted to only if the mother is in poor condition. The recommended amount is 90mls of milk per kilogram of body weight per day for the first week of life. This is followed by 150mls for the second week and 180 - 210mls per kilogram of body weight during the third week. To avoid over distension of the stomach, vomiting and subsequent inhalation, small feeds, of greater concentration, are given at one to two hourly intervals.

Remember:
Try always to treat each infant individually and give the amount of milk the individual infant needs, depending on their appetite, tolerance to feeds and general condition.

Method of feeding
The method of feeding is determined by the infant's size, general health and presence of sucking and swallowing reflexes.
Breast feed as soon as the infant's condition allows. Infants of 1.8 kilograms and over, with good sucking and swallowing reflexes, may be spoon fed. In cases where neither of the aforementioned options is possible, naso-gastric tube feeding is preferred because once instituted it can be left for a week before it is changed and carries less risk of bronchial aspiration. The latter is often associated with oro-gastric feeding, especially if the tube is not well pinched when being withdrawn.

Naso-gastric method of feeding
Should you decide to use the naso-gastric method of tube feeding the following points should be taken into consideration:

- A small size polythene tube (polytex) should be used for feeding infants weighing 1500g or less. A rubber catheter FG10 can also be used.
- Although the tubes come in pre-sterilised packets, it is advisable to boil them for a few minutes before use to make them supple and easy to pass.
- The arms of the infant are wrapped and the head of the cot raised.
- The nostrils should be cleared with wet cotton swabs.
- The required length of the tube to be passed is determined by measuring from the bridge of the infant's nose to its sternum. It should be marked before boiling (polytex tubes are already marked).
- When the tube is passed, the stomach contents are aspirated and tested with blue litmus paper. Red discolouration means the tube is in the stomach.
- The aspirate colour and amount should be noted and recorded.

 If the aspirate consists of clear milk it should be returned and the feed decreased by same amount.
 If the aspirate is blood or bile stained discard and replace by equal volume of normal saline in the intravenous fluids.
 The barrel of a syringe is used as a funnel for giving the feeds which should be allowed to flow by gravity and not pushed by a syringe piston.
 The amount of feed the infant has taken is recorded.
 After feeding, the baby is left to rest quietly on their back with the head turned to one side or made to lie on the right side for 15 minutes.

General Feeding Steps to be Taken
The following steps should generally be taken when feeding the baby:

- Cleanliness must be observed. Feeding utensils should be decontaminated and soaked in a solution of jik (1:6) for 10 minutes then dried.
- Wind should be brought up by raising the infant to sitting position or gently rolling them against your hand or rubbing their back with your right hand. Naso-gastric feeding infants do not require this.
- The baby should be put on the right side after feeding with the head of the cot raised to allow any vomited milk to run out of the mouth.

- You should always have an aspirator at hand to remove regurgitated milk from the naso-pharynx.
- Record the actual amount of feed.

Supplements of vitamins A, B, C, D, folic acid and iron are usually given to the premature infant because they have no store of iron, vitamins and mineral salts before birth. Artificial feeds cannot provide all the nutritional needs of an infant.

- Staff in baby care unit should be in good health and have no foci of infection or colds.
- Staff should be meticulous in cleanliness and should be proficient at resuscitation of the baby.
- Frequent hand washing is imperative in a premature baby nursery. Principles of infection prevention should always be practiced (see module one).
- Visitors should not be allowed into the premature unit because they may bring in micro-organisms.
- Only the parents should handle the infant if nursed at home or maternity centre.
- The infant should not be brought out into the open until it can maintain its body temperature.

Prevention of Infection

Preterm infants are very susceptible to infection, therefore:

- In hospital, the parents are only allowed to view their babies through the glass windows of the incubator. The mother should be taught how to handle the baby because her touch is important for development of the mother/baby relationship.
- The nursery must be kept clean. Damp dusting or mopping is preferred to sweeping and dry dusting to minimise spread of micro-organisms.
- Avoid direct draughts in the nursery by keeping the windows shut.
- Infants in lying-in wards or maternity centres must sleep under a net. Infectious babies should be isolated and potentially infected babies should be given prophylactic antibiotics.
- The incubator should be cleaned every day and the water changed and disinfected because an incubator provides an ideal environment for organisms to multiply.

Try to write down at least four observations you need to make to monitor the progress of the premature infant.

1. Respiration of the infant, that is, do they exhibit laboured breathing and periods of apnoea. The respiration rate should be taken and recorded four hourly or more frequently, in case it is unsatisfactory.
2. The temperature should also be recorded four hourly since fever and hypothermia are bad signs. A premature neonate who is progressing should be able to maintain their body temperature.
3. Auscultation of the heart and recording of the heart rate (Apex beat).

4. Observe closely for colour changes like jaundice occurring within 24 - 36 hours of birth. This is a serious occurrence, which must be reported. Other colour changes include cyanosis, pallor and greyness are also significant and should also be reported.
5. Rashes, discharge from the eyes or moist umbilical cord, grey colour and constantly low temperature are usually signs of infection and should also be reported.
6. Note the amount of feed taken by the infant, the method of feeding and any vomiting of feeds.
7. Abdominal distension and oedema of the face, abdomen and legs should be reported if severe.
8. Note if the infant is passing urine well. Absence of urine in the first 24 hours must be reported. Frequent stools also are noted. Loose stools may indicate infection.
9. The neonate should be weighed 12 - 24 hours after birth. Thereafter, weighing is usually done twice weekly because weight gain is usually slow. Weight loss in a premature infant should not alarm the midwife, provided the infant's general condition is satisfactory and there is no vomiting.
10. The haemoglobin level should be estimated at birth and thereafter on a weekly basis to exclude anaemia.
11. The general behaviour of the infant with

particular attention to its activity should be noted.

Response to Noise

A premature infant responds to noise in a similar way to a mature baby. There is evidence that excessive noise is detrimental to the development of normal hearing and can be stress provoking for the sick baby.

The midwife should, therefore, be aware of these possible deleterious effects and take steps to reduce noise levels where possible. During periods of quietness, it is customary to dim lights. Longer quiet sleep patterns are related to better weight gain.

Education of the Mother

Time and patience are necessary to reorientate the mother, whether she is a primipara or multipara. The mother may see the infant as a fragile little being and is often scared of handling them. It is necessary to introduce the mother gradually to handling, feeding and general care under supervision before discharge. In some hospitals, the mothers stay in a mother's home and come up to the premature unit every three hours to feed and nurse their infants under supervision.

Mothers should be allowed to look after infants whose weights are 1.8 kilograms and over. Breast feeding should be encouraged and if the baby is on artificial feeds for any reason, the midwife should ensure that the mother is able to prepare the feeds.

When the baby is ready for discharge, an arrangement should be made for the mother to room in for two to three days to enable her to undertake the 24 hour responsibility of care. It is advisable to discharge the infant when they are 2kg or over, have a constant temperature and are able to feed well.

You should educate the mother on feeding, winding and bathing the baby and how to avoid gastroenteritis and respiratory infections. Immunisation should be given when the child attains a weight of 2 kilograms and should be followed up in a paediatric special clinic until the developmental milestone is passed. The mother should also be encouraged to attend follow up sessions in a child welfare clinic until her child is five years old.

As a health worker, you should be aware, and you should make the mother aware, of the fact that a premature baby is prone to the following complications:

- Cyanotic attacks
- Cerebral haemorrhage
- Heart failure and pulmonary oedema
- Jaundice
- Anaemia
- Infection
- Poor mental and intellectual development in later years
- Respiratory Distress Syndrome

The baby's care giver, both in and out of the hospital environment, should maintain constant vigilance for any symptoms of the aforementioned conditions.

Next you will look at the other type of low birth weight infant.

The Small for Gestational Age Infant

The small for gestational age (SGA) infant may be a full term infant who appears small for their age. The clinical appearance of this infant may be of several types. The first type is:

- Low weight for gestational age
- Typically long and thin with apparently disproportionately large head
- With skin that is often dry and peeling and there is abundant palmar and plantar skin creases
- Described as looking like 'worried old men' (it has been suggested that having been starved in utero, they are worried that this pattern is going to continue)
- Active in behaviour, indicating from early age that they are hungry

Despite their low weight for their gestational age, the length of this type of baby is less affected and the occipito frontal head circumference may well be within normal range for a term infant. This group demonstrates an asymmetrical growth pattern.

The second group of infants are apparently small for their gestational age but growth retardation is symmetrical. These are likely to be totally normal infants whose size is consistent with ethnic and genetic expectations, for example, small bodied parents may give birth to small babies.

A third group comprises those whose growth has been stunted in utero by the teratogenic effects of infection, drugs or alcohol abuse. In this group, all parameters such as weight, length and head circumference are compromised. This last group is likely to present a variety of

problems in the neonatal period, due to the effects of these drugs/substances.
In summary, therefore, the main causes of small for gestational age infants includes:

- Maternal diseases such as hypertensive disorders
- Placental transfer of inappropriate substances which have teratogenic effects such as nicotine, alcohol, cocaine or infective agents
- Extremes of maternal age, that is those at either end of the childbearing spectrum, for example, very young or old parent
- Socio-economic factors, including poor nutrition of the mother during pregnancy
- Parity and number of foetuses in utero all impinge on the normal growth pattern

Management of the Small for Gestational Age Infant
Neonatal management is planned to redress the balance or at best minimise the effects of intrauterine deprivation.

Immediate Care

There is no significant difference in management at delivery from that described for the normal infant except perhaps that the small for gestational age infant would be more susceptible to hypothermia. The delivery room should, therefore, be kept warm and the infant dried and wrapped in a warm blanket or wrap.

Nutritional Needs

Since these babies have been starved in utero, as soon as they are born they are very hungry. They suck at the fingers and early and frequent feeding is called for. Since successful initiation and establishing of lactation operates by the law of supply and demand, mothers who are breast feeding may encounter a few problems, where the demand far exceeds the supply. Breast milk is ideal because in the first few days it contains high proteins and immunoglobins that the SGA infant needs. If for reasons beyond the mother's control, she should have to use formula milk, the child's caloric requirements should be calculated at a higher rate.
Lack of subcutaneous fat and liver glycogen stores compromise the nutritional reserves of the SGA infant. Feeds are, therefore, calculated at a rate of 90mls/kg/day increasing by 10 - 15ml/kg/day to a maximum of 200ml/kg/day. Blood sugar should be monitored six hourly for 48 hours. Loss of weight is minimal in these infants, who will soon exhibit rapid weight gain.

Temperature Control

The infant has a relatively mature temperature control mechanism but lack of subcutaneous fat makes them more susceptible to hypothermia from fluctuations of the environmental temperature.
A thermal neutral environment should be provided and the infant's temperature should be monitored regularly.

Skin Care

Particular attention should be paid to those infants with dry, cracked and peeling skin.
Ensure the infant is kept clean and dry to prevent infection. After bathing the infant, apply Vaseline oil to the skin. Encourage the mother to massage her baby, which offers the additional benefits of enhancing the mother baby relationship.

Complications Associated with the SGA Infant
The following complications are associated with the SGA infant:

- Asphyxia incidence is high but respiratory distress syndrome (RDS) rarely occurs
- Hypoglaceamia may occur due to delayed or low glucose feeds
- Hypothermia is common, especially if the environmental warmth is inadequate
- There is a substantial mortality risk although the rate is lower than in preterm infants

You have finished looking at the first group of high risk neonates.
You have seen that they include preterm and small for gestational age infants.
The table below will enable you to make a quick comparison of the characteristics associated with each high risk group.

Preterm	**Small for Gestational Age**
Skin red and shiny, lanugo, plentiful	Skin dry and wrinkled
Skull bones soft,	Skull bones firm

sutures and fontanelles wide	
Plantar creases not visible	Plantar creases are well defined from toes to heel
Most of the reflexes e.g. swallowing, moro absent	Moro and traction reflexes present
Pinna of ears soft and flat	Pinna of ear has cartilaginous ridges and firm
Born before 37 weeks gestation	Born at term
Eyes always closed	Eyes wide open (worried look)

The Post Term Infant

You will now look at the characteristics of a post term infant.

Try to list several characteristics of a post term infant.
A post term infant is a baby born after 294 days, that is, 40 weeks of gestation. Accurate dating and calculation of the gestation period is important. The main characteristic features of a post term infant include:

- Skin is loose, dry and disquamating (peeling off)
- Skull bones are hard and firm
- Small fontanelles and narrow sutures
- Nails are overgrown hence long

This infant is at risk of developing complications because:

- The placenta starts diminishing in its functions and hence the foetus may not get enough nutrients and oxygen. This will lead to asphyxia in utero and passing of meconium which will affect the infant's life.
- Since the bones of the skull are firm, moulding is not effective and this may lead to a difficult delivery.

In managing the infant, care should be taken to resuscitate the baby first in the same manner as with a preterm infant.
Due to inborn errors of metabolism the post term infant will not thrive, will be irritable, may have changes in stool and will suffer from colic or vomiting with weight loss. Any infant not doing well on the usual formula or breast milk should be evaluated for some type of inborn error of metabolism.
The two common causes of metabolic disorder in newborn post term infants are:

- Hypoglycaemia and Hyperglycaemia
- Hypocalcaemia and Hypercalcaemia

Hypoglycaemia
This is a condition of low blood glucose in the body. Criteria for hypoglycaemia are:
Full term infants - blood sugar < 2.2mmol/l (40mg/dl)
Premature infants - blood sugar < 1.1mmol/l (20mg/dl)

Symptoms of hypoglycaemia in the newborn can be divided into major and minor symptoms. Major symptoms include apnoea, convulsions and coma. Minor symptoms include jitteriness, irritability, tremors, apathy, cyanotic spells and temperature instability.
Many babies may remain asymptomatic. It is unusual for a newborn with hypoglycaemia to have an autonomic nervous system response with sweating, pallor and tachycardia as occurs in adults. It is, therefore, not possible to confidently diagnose neonatal hypoglycaemia clinically as the symptoms are so similar to infection.

Remember:
Low blood sugar detected by a stick test (Dextrostix or BM sticks) should be checked by a laboratory blood essay for glucose.

There are several causes of hypoglycaemia. These include:

- Decreased substrate (a substance upon which an enzyme acts) availability, for example, in small for gestational age infants and premature infants
- Increased glucose utilisation, for example, inborn errors of amino acid metabolism, glycogen storage disease, and galactosaemia
- Infants of diabetic mothers and large for gestational age infants are also at risk of developing hypoglycaemia
- Miscellaneous factors like birth asphyxia and endocrine deficiencies in growth hormone and cortisol

The major aim of management is to prevent hypoglycaemia from developing. However, if it does occur, it should be detected early, before symptoms are fully apparent.
The following steps should be taken:

1. Monitor blood glucose frequently depending on previous blood glucose levels.
2. Early and frequent feeding leads to good prognosis in asymptomatic hypoglycaemia. In diabetic infants hypoglycaemia can be prevented.
3. Treatment should be initiated without any delay and plasma glucose level rechecked directly to ensure that the problem
   is resolved.
4. 10 - 20% dextrose should be administered intravenously and carefully monitored because should it stop suddenly, because of extravasation into the tissues, there is risk of reactive hypoglycaemia.
5. If there is difficulty or delay in starting the infusion, then intramuscular glucagon can be given.

Prognosis
Infants with asymptomatic hypoglycaemia are usually normal at follow up assessment. Some of the babies with major symptoms of hypoglycaemia die or have a severe neurological handicap at follow up. The problems they may have include:

- Mental retardation
- Convulsion
- Spasticity and microcephally

Hyperglycaemia
This is usually defined as blood sugar levels greater than 9 mmol/l at which level glycosuria may occur.
It frequently occurs in an infant who is receiving 10% dextrose infusion or parenteral nutrition. Hyperglycaemia usually responds to decreasing the glucose concentration or the infusion rate. Hyperglycaemia must be considered to be a sign of septicaemia.
In management, soluble insulin 0.1 units per kg body weight should be given intravenously and repeated as necessary to keep blood sugar below 9 mmol/l.
Next you will look at other deficiencies closely related to hypoglycaemia and hyperglycaemia.

Hypocalcaemia
This is usually defined as a serum calcium concentration of less than 1.8 mmol/l (7.5mg/dl). The newborn rarely develops symptoms unless the plasma calcium is lower than 1.7 mmol/l. The condition usually occurs within 72 hours of life in the following situations:

- Premature neonates
- Associated with RDS
- Birth asphyxia
- Infants of diabetic mothers
- Neonatal sepsis

The reasons why it occurs are not fully understood but persistent hypocalcaemia is due to hypoparathyroidism.
This is a rare condition and may be inherited in either x-linked or autosomal recessive manner. Late hypocalcaemia is often referred to as neonatal tetany and occurs after the first week of life. In the past it was commonly a result of feeding the infant on unmodified cow's milk. Late hypocalcaemia, which is rare, is due to maternal hyperparathyroidism.
Hypocalcaemia can cause tetany, jitteriness and convulsions, as well as seizures, which may be identical to those due to hypoglycaemia or other cerebral causes. Occasionally bradycardia and apnoea may also result from hypocalcaemia.
The condition can be prevented by giving 10% Calcium Gluconate in intravenous infusion to ill infants, who are not taking oral feeds. Observe the infusion site carefully as extravasation may cause severe tissue injury.
Severe and resistant hypocalcaemia such as that which occurs in congenital parathyroidism may require Vitamin D supplementation. Some cases of hypocalcaemia will not respond to calcium gluconate infusion and require magnesium sulphate.

Prognosis
Most infants recover completely with no adverse neurodevelopmental consequences. Severe dental caries may be seen in the primary dentition of some infants with tetany due to hypocalcaemia. Remember that calcium is essential to the development of bones including teeth.

Hypercalcaemia
This may occur as a complication of calcium overdose. Usually, serum calcium is greater than 2.75mmol/l, which is often due to excessive use of calcium gluconate in intravenous fluid therapy.
Other causes include:

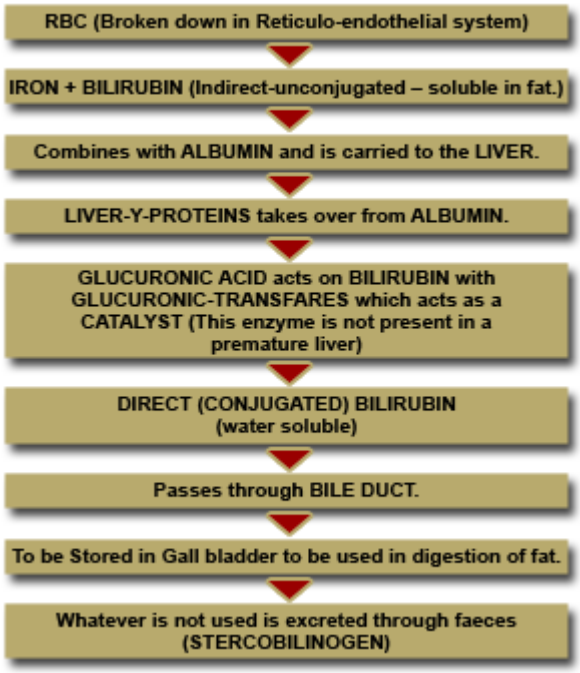
- Renal failure
- Inappropriate anti-diuretic hormone secretion
- Hyperparathyroidism

- Vitamin D intoxication

Neonatal Jaundice

This is one of the most common problems encountered by the newborn. Elevated levels of unconjugated bilirubin lead to the most common form of neonatal jaundice. If this passes through the blood brain barrier it can cause permanent brain damage, with chronic disability.
Jaundice is a condition in which there is yellow discolouration of skin, mucus membranes and body fluids occurring during the first 28 days of life due to deposition of bilirubin.

The metabolism of bilirubin



Due to obstructions in the liver, the bile is forced back into circulation. It may also be recirculated if there is a delay in the excretion of stercobilinogen. Bilirubin from the blood circulation is excreted through the kidneys and is called urobilinogen. Obstructive jaundice stool is pale and may occur as early as the second week of life of the infant.

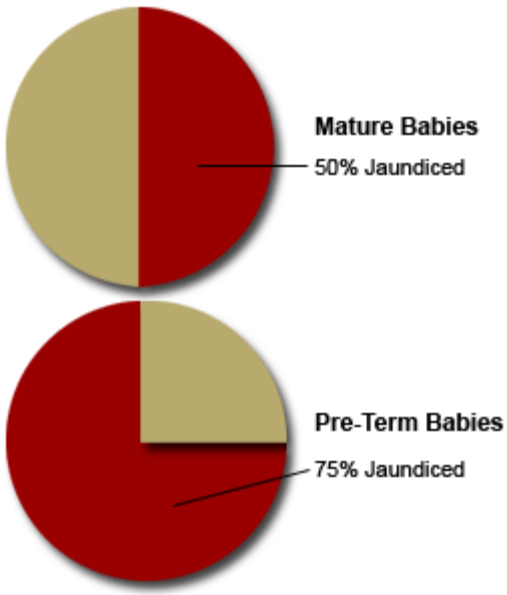
Try to list three causes of neonatal jaundice.
I hope your answer included some of the following causes:

- Physiological changes
- Rhesus incompatibility
- ABO incompatibility
- Infections
- Obstruction in the bile duct or liver

Next you are going to look at the different types of jaundice.

Physiological Jaundice
Jaundice is found in 50% of mature babies, while 75% of pre-term babies are affected.
The condition is common in a newborn especially the preterm, particularly after oxytocin stimulated labour and when breast feeding is initiated (it has been shown that some women excrete a steroid, known as pregnanediol, which inhibits liver conjugation). During foetal life in utero, the Hb is high (14 - 18 mg/100mls). The excess red blood cells are no longer required by the body after birth and hence are destroyed. The Hb is reduced when the red cells are broken down. However, the liver cells are not mature enough to cope with the breakdown rate and, therefore, there is a high level of bilirubin in the blood.
This condition occurs between the third to sixth day of life and disappears within the seventh to tenth day of life. It may take longer in premature babies.

Jaundice ratios in mature and pre-term babies



Physiological jaundice does not do any harm to the child in the majority of cases. In rare cases, where the jaundice is marked, there may be a little sluggishness or refusal to feed on the part of the infant for some time.
The infant should be given extra fluids with glucose and the mother should be encouraged to breast feed. If the condition persists then further investigations are recommended,

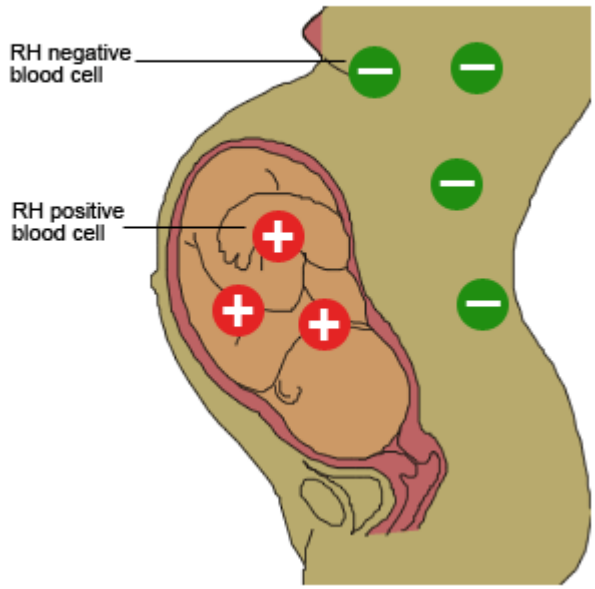
although it normally disappears without any treatment.

Jaundice Due to Rhesus Incompatibility

This is also known as haemolytic disease of the newborn. The Rhesus factor is an antigen found in the red blood cells of about 83% of the population. Approximately 17% of the population is said to be rhesus negative. Problems arise if a Rhesus negative mother and a Rhesus positive father have a child who inherits the Rhesus positive traits of the father.

In this case, the child will receive a chromosome with the recessive gene 'd' from the Rhesus negative mother and another with the dominant gene 'D' from the Rhesus positive father. The later chromosome can be problematic. The chromosome is foreign to the mother, and should the foetal blood escape into maternal circulation, it will stimulate the formation of antibodies by the mother.

Rhesus incompatibility



The first born is not usually affected unless the mother had previously undergone an abortion.

During the third stage of labour, when the placenta is being delivered, the maternal and foetal blood mixes, and the mother's body is sensitised against the baby's blood. There are antibodies circulating in the mother's blood due to
this sensitisation.

If the mother conceives again and the foetus is Rhesus positive, then the antibodies circulating in the mother's blood will cross to attack the Rhesus positive genes in the foetus. The blood cells are destroyed, causing anaemia and excess bilirubin in the blood of the baby. The baby will consequently be born with jaundice, known as Kernicterus gravis neonatorum, which is normally seen 12 - 24 hours after delivery. Sometimes the neonate may not appear jaundiced, but the amniotic fluid will be golden and the cord is yellow.

Remember:

The most important gene in Rhesus incompatibility is the dominant D. Persons possessing this gene are commonly termed Rhesus positive. When it is absent from both chromosomes and its place is occupied by the recessive d, the individual is termed negative.

Since early detection may save the infant from developing more serious complications, it is important to understand how the condition presents.

The classic presentation of Kernicterus in a newborn is:

- Progressive development of lethargy
- Rigidity
- Opisthotonus (a form of spasm in which the head and the heels are bent backwards and the body bowed forward)
- High pitched cry
- Fever and convulsions
- In 50% of affected infants, death follows
- At autopsy, there is bilirubin staining and necrosis of neurons, especially in the basal ganglia, hippocampus and subthalmic nuclei

For those infants who do survive, kernicterus will often present with:

- Cerebral palsy
- High frequency deafness
- Mental retardation
- Paralysis of upward gaze (parinaud's sign) where the baby looks upward permanently

Preterm infants may manifest more serious bilirubin brain damage.

High frequency hearing loss is the commonest feature of the bilirubin encephalopathy syndrome and is most commonly seen in premature infants. Acidosis, asphyxia, prematurity and drugs which compete for bilirubin binding sites, predispose infants to kernicterus possibly by opening the blood brain barrier to bilirubin molecules.

In the most severe form of jaundice, the baby is oedematous, has fluid retention in the body and may have cardiac failure. This baby is not usually saved. The term 'hydrops foetalis' is used to describe this foetus, which is usually a dead macerated infant. The placenta is usually large and oozing a lot of fluid.

Management

The aim of management is to save the unborn baby.

During antenatal care, profile blood is taken for grouping and Hb and the following steps should also be taken:

1. A mother who is Rhesus negative should be closely observed and at 26 - 28 weeks gestation blood is taken for Coomb's test, which is repeated at 34 - 36 weeks.
2. Antibody titre is estimated. If it continues to rise, then labour is induced.
3. Blood transfusion exchange can be done in utero (this is possible in more developed countries).

Care During Labour

Labour may be induced by the 36th - 37th week. Sedatives and anaesthetic drugs should be given with restraint, since this is a high risk baby. Preparations should be made for blood exchange transfusion.

Care At Birth

The cord blood is taken immediately at birth for Haemoglobin (Hb) and Coomb's test and serum bilirubin. A bilirubin level of above 4 mg/100mls and Hb of below 14g/100 mls is an indication that a severe haemolytic process has already started. Blood exchange is urgently necessary. Normal bilirubin is 2gm/100ml.

The cord should be cut as soon as possible after birth to prevent further increase of blood from the placenta. The length of the cord should be at least 3 - 4 inches (7.6 - 10.2cm) to facilitate its use for blood exchange transfusion. Wrap the cord with gauze soaked in saline solution to prevent drying. Weigh the baby when it is born as this will guide you in the calculation of dosages of drugs and blood for exchange.

Note the following points, which will guide you on when blood transfusion exchange is needed:

- Bilirubin level rising at the rate of 1mg per hour where the mother is Rhesus negative
- A drop in Hb of 1mg per hour or 13mg or below at birth
- If the bilirubin level is 10mgs, the baby should be put under phototherapy and exchange transfusion should be organised

Early feeding reduces the incidence of jaundice by preventing dehydration and the elevation of free fatty acids. In addition, feeding will overcome bowel stasis, minimise the effects of the enterohepatic bilirubin circulation and increase the excretion of bilirubin.

Exchange Transfusion

The purpose of a blood exchange transfusion is to remove toxic bilirubin in exchange for fresh blood. The main aims of the procedure are:

- To remove toxic unconjugated bilirubin which has already accumulated
- To remove the sensitised red blood cells of the neonate to prevent further haemolysis
- To correct anaemia
- To remove the anti Rhesus antibodies from the neonate's circulation

The exchange transfusion aims at reducing the levels of bilirubin and correcting anaemia. Please note that the donor's blood must be compatible with both infant's and mother's serum.

The following steps should be followed when preparing for exchange transfusion:

1. Explain the procedure to the parents and get their signed consent.
2. Get the exchange transfusion tray.
3. Prepare the equipment required for exchange transfusion, including fresh blood.
4. Ensure there is an overhead heat source to maintain room temperature at 28 - 32 degrees Celsius.
5. Starve the baby for four hours before the procedure in order to avoid over distension of the abdomen.
6. The baby should be bandaged to an across-splint.
   A stethoscope for frequent checking of heart rate during the procedure is strapped to the left chest wall of the infant.
7. You should have a thermometer for temperature monitoring.

Exchange Blood Transfusion Technique
Try to describe the role of the midwife during a blood exchange transfusion.

Did you note the following:

- The midwife assists in preparing the equipment, the baby and stays with the baby throughout the procedure.
- The doctor should pass a special polyethylene catheter through the umbilical vein into the inferior vena cava.
- 10mls of blood is withdrawn for assessment of bilirubin, glucose level and haemoglobin before transfusion. If blood glucose is low, it will not be replaced to avoid overloading the circulation.
- The doctor then starts by removing 10 - 20mls of blood.
- This is discarded then replaced with the same amount of compatible Rhesus negative blood through the same catheter.
- The procedure is repeated until the calculated volume has been replaced. About 300mls is exchanged at a time and the entire procedure takes about two hours.
- The amount of blood to be given is calculated according to body weight, that is, 170ml/kg.
- A continuous slow infusion of calcium gluconate may be given concurrently in order to counteract any hypocalcaemia due to the citrate in the stored blood.
- The baby's condition, that is the heart rate, respiration and umbilical vein pressure (normal 4 - 8cm H2O), is monitored every 5 - 15 minutes.
- Temperature is also monitored in order to avoid the development of hypothermia or hyperthermia.
- Keep a record of blood injected and withdrawn and any drug administered.
- Report any cyanosis, pallor, tachycardia, rib recession or grunting, twitching, jittery or any abnormal movements by the baby.
- If the baby is restless, calm them by giving a stuffed teat soaked in 5 - 10% dextrose/glucose for baby to suck.The whole procedure takes about two hours and at the end, the last syringe of blood removed is preserved for post transfusion test.

Care of the Infant after Transfusion

The infant is placed in a warm cot or incubator and observed closely quarter to half hourly for six to eight hours. Records of respiration and heart rate should be kept. The umbilical cord dressing should be checked frequently for bleeding every half hour for the first few hours, then four hourly.

Blood serum bilirubin levels are estimated four hourly. Capillary blood glucose should also be estimated at four hour intervals.

The infant should be put under phototherapy as soon as the procedure is over because the serum bilirubin level will rebound as antibodies in the tissues return to the circulation and haemolyse further red blood cells.

Remember:
If the baby under phototherapy is passing loose stools, the baby can be removed and treatment given outside the phototherapy room.

If the bilirubin levels rise again instead of falling, two to eight hours after the initial exchange, a second exchange will have to be done. Meanwhile, you should reassure the parents. The rest of the care will be as for newborn infants.

Remember:
The exchange transfusion should be done early, before the serum bilirubin levels have exceeded 16mg/100mls. Once the signs of kernicterus have set in, it is too late to expect perfect results even if the exchange is given.

However, you should note that there are several adverse effects of the blood exchange procedure, which include the following:

Cardiac failure (especially when the exchange is done too fast)
Cardiac arrest (hypoglycaemia due to decreased blood sugar levels)
Air embolism
Perforation of the intestines
Hypocalcaemia due to decreased level of potassium

Prevention of Rhesus Isoimmunisation

Mothers at risk of developing Rhesus isoimmunisation are given an injection of anti D within 72 hours of delivery, especially during the first delivery. Appropriate antenatal care is essential to detect some of these risk factors. The mother should be advised to deliver in a hospital environment.

If kernicterus sets in as a complication, the infant will present with the signs and symptoms that have already been listed earlier.

ABO Incompatibility

Group factor incompatibility is much more common than Rhesus incompatibility but the disease is milder. There is no sensitisation and this occurs if the baby happens to be blood type A or B and the mother is O, which has antibodies for A and B.

Incompatibility happens if the maternal blood enters the foetus' blood and the antibody attacks. It is dependant on the blood type, which has entered the foetal circulation. Treatment is the same as for Rhesus incompatibility.

Mother's Blood Group	Infant's Blood Group	Frequency of Incompatibility
O	A or B	Common
A	B or AB	Rare
B	A or AB	Rare

Prevention of Kernicterus in a Jaundiced Baby

The complication of kernicterus in jaundice can be prevented by performing a blood exchange to keep the serum bilirubin level below 20mg/100ml. Phototherapy to the jaundiced infant will prevent a further rise in serum bilirubin, so that kernicterus causing levels are not reached. In some hospitals, albumin is given with exchange blood transfusion in an effort to bind bilirubin with the aim of lessening brain damage. Finally, you should avoid the use of sulphonamides and salicylates in infants.

You have come to the end of this sub section and will now move on to infections affecting neonates.

Neonatal Infections

You will now focus on infections that are passed on from mother to child and those that are derived from the surrounding environment.

Sepsis or septicaemia is the presence of micro-organisms in the blood. Infection is an ever present problem in the newborn and sepsis has always been one of the prime causes of neonatal mortality. Neonates are susceptible to infection for many reasons, for example:

- Their polymorphonuclear leukocytes are less efficient in phagocytosis.
- The infant receives passive transplacental immuno-globulins from the mother, which protect against common viral infections and some bacterial infections for the first three to six months of life. However, passive immunisation from the mother does not include 1gA, 1gE or 1gM immunoglobins. The level of 1gG is much lower in premature infants.
- The inflammatory response is less rapid and extensive than later in life.
- The baby is bacteriologically sterile, which results in little competition from existing bacterial flora when they are exposed to pathogens.
- The likelihood of infection is increased in the male infant for unexplained reasons.
- The preterm and small for gestational age infants are particularly predisposed to infection.

You will now look at the various origins of infections.

Intrauterine (Congenital) Infections

Transplacental infections in the first trimester include toxoplasmosis, rubella and herpes simplex type II. In the second trimester, possible infections include Treponema pallidum and in the third trimester and labour, infections will include herpes zoster, hepatitis B, B-haemolytic streptococcus, Haemophilus influenzae and pneumococcus.

Ascending Infections

These occur after early rupture of the membranes and represent the most common form of intrauterine infection. They are often a result of repeated vaginal examinations. Causative organisms include the most frequent pathogens like escherichia coli, Klebsiella Pseudomonas, Proteus aureas and Streptococcus feacalis.

All of these are bowel organisms, which may have been introduced when performing vaginal examinations. Other causative organisms include group B haemolytic Streptococcus and

group A Streptococcus, and occasionally Staphylococcus aureas.

Intrapartum Infections

These organisms colonise the infant as it passes through the birth canal.
Prolonged rupture of membranes also predisposes the neonate to intrapartum infection. Pathogens include herpes simplex II, Neisseria gonorrhoea, hepatitis B, Chlamydia Trachomatis,
Candida albicans.

Nosocomial Infections

These are infections acquired in the hospital. They include bacterial infections, like staphylococcus, sallmonella, shigella and anaerobic bacteria as well as viral infections like rotavirus, adenovirus, echovirus, coxsackie. They may also be fungal infections, for example, candida albicans.

Try to list five indicators you would consider in detecting an infection problem in the infant.
First and foremost, you should be vigilant in your observations to help in the early diagnosis and treatment of infection. Highly susceptible infants, who should be observed closely, include:

- Premature neonates
- Babies born following prolonged rupture of membranes
- Babies born following prolonged and difficult labour
- Babies who have undergone prolonged resuscitation
- Babies who have undergone operations for surgical correction of congenital anomalies
- Infants born by mothers with diabetes, toxaemia of pregnancy and chronic anaemia
- Babies whose mothers have active PTB
- Babies delivered in unhygienic surroundings, especially those born before arrival (BBA's)
- Bottle fed babies

The presence of one or more of the following signs is very suggestive of infection:

- Refusal to suck
- Vomiting
- Diarrhoea with or without blood or mucus in stools
- Abdominal distension
- Irritability
- Weak or high pitched cry
- Listlessness or lethargy and loss of interest in the surroundings
- Twitching of limbs or generalised convulsions
- Diminution or absence of reflexes especially Moro or startle reflex
- Full fontanelles
- Alteration in rate and rhythm of respiration, especially laboured or grunting
- Nasal discharge
- Small red patches on the skin
- Ecchymoses, that is, large bleeding areas on the skin, frank bleeding from the rectum and mouth
- Presence of rash, especially pustules
- Jaundice
- Cyanotic attacks

Remember:
The temperature may be raised, but a LOW temperature in the presence of an infection is not uncommon in the neonates.

To confirm your diagnosis the following investigations may help:

- Hb estimation
- WBC count
- Urinalysis
- Blood culture
- Lumbar puncture
- Malarial parasites on blood slide

Prevention of Infection
Your role as a midwife is to be observant and create a safe environment that decreases chances of the infant acquiring infections after birth.

- Encouraging and assisting mothers with breast feeding, hence increasing the infant's immune protection.
- Ensuring careful and frequent hand washing by all caretakers. This simple procedure remains the single most important method of preventing the spread of infection in infants.

 Adequate spacing of cots when neonates are in the nursery with other infants.
 Always using individual equipment for each infant.
 Avoiding any irritation or trauma to the infant's skin and mucous membranes, as intact skin provides a barrier against infection
6. Discouraging visitors who have infections or who have been exposed to communicable disease, from visiting the hospital or home.
7. Isolating infected babies when absolutely essential.
8. Observing for and appropriately treating, any infection in the mother prior to the infant's birth.
9. Giving prophylaxis treatment to an infant born of mothers with infections.
10. Effective health education to the mother on importance of infection control and prevention.

Infants with Perinatal HIV/AIDS Infection

In this time of high HIV/AIDS prevalence, it is important to cover this issue. Although HIV/AIDS will be discussed in more detail in unit six, it is important to look at it here because infants are often at a high risk of infection.
Although HIV is transmitted in utero, neonates rarely present with AIDS. However, there may be signs of congenital infection, for example, low birth weight, small for gestational age, anaemia, jaundice, thrombocytopenia or hepatomegaly.
Infants may present with the severe infantile form of HIV infection with opportunistic infections, involvement of CNS, as well as evidence of cellular and human immune deficiency within six to nine months. The clinical course may vary, but with time, there is progressive immune dysfunction accompanied by
clinical deterioration.

Non Specific Signs and Symptoms of the HIV Disease

The World Health Organisation's (WHO) clinical case definition for paediatric HIV disease is classified according to major and minor criteria.
The major criteria include:

- Weight loss or failure to thrive
- Diarrhoea for more than one month
- Fever for more than one month

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- Weight loss or failure to thrive
- Diarrhoea for more than one month
- Fever for more than one month

Remember:
HIV infection should be suspected in a child with two major and two minor clinical features from the lists above

Management of a Neonate Born to a Mother with HIV

This could include prevention of mother to child transmission (PMTCT) by the use of anti retroviral drugs (nevirapine), which are administered to the mother during labour and to the infant within 72 hours of birth.
However, here you are mainly going to cover nursing care, as medical treatment will be dealt with in unit five of this module.

1. Avoid breaking/bruising the baby's skin.
2. Wipe the baby dry with particular attention to the face.
3. Feed the baby within half an hour to one hour.
4. Sleep and rest should be adequate. Ensure that medical/surgical procedures are coordinated, so that they do not interfere with the rest and sleep requirements of the infant. All procedures should be done at once to allow the infant to rest.
5. Skin integrity should be maintained. The skin should remain intact, as it is prone to fungal, viral and bacterial infection. Infectious skin conditions will require barrienursing precautions.
6. Observe the body temperature frequently as this may be elevated where there is an infected skin condition and may be an indicator to the possible developmentother infections.
7. Observe both baby and environmental hygiene at all times.

Nutritional Status

The Kenya PMCT Project guidelines on feeding an HIV infected baby state that:

1. Babies should be exclusively breast fed for the first six months of life. There is early evidence that mixed feeding will increase the risk of transmission through breast milk. This is because, with mixed feeding, the delicate gastro intestinal tract is traumatised, creating avenues

for the entry of the virus into the breast milk.

2. The infant should preferably be fed on milk only for the first six months. After this, balanced complimentary foods are added to the diet.
3. Respect the mother's choice of infant feeding and encourage the parents to participate in decision making. Decisions made by the parents will be better upheld than the ones imposed on them.
4. The infant may have problems of wasting syndrome, failure to thrive, low birth weight and/or gastroenteritis. The child should have adequate diet in order to maintain body function and growth. If feeds are tolerated, provide the appropriate diet and maintain a record of dietary intake and faecal/vomit output. Measure the infant's weight regularly.
5. The child's fluid and electrolyte balance should be good in order to counteract dehydration due to diarrhoea.
6. Safety is of paramount importance as the immune dysfunction increases the infant's susceptibility to infection. Monitor vital signs to detect early infection. Ensure basic infection control procedures are applied while nursing the infant.
7. Maintain the body temperature because the problem of pyrexia and febrile convulsions is common. Obtain and record temperature four hourly. Use tepid sponge when necessary to reduce fever.
8. The neonate may experience breathing problems due to respiratory infections. Monitor respiration patterns and administer medication or oxygen when necessary. Position the infant for appropriate respiratory efforts.
9. Implement routine immunisation as per the Ministry of Health (MOH) guidelines.
10. Vitamin A supplements should also be given to the infant according to MOH guidelines. However, if the infant is on commercial infant formula, there is no need for additional supplements.
11. The child should be observed for up to five years. Monitor growth closely, that is, monthly in the first year, then every three months in the second year.
12. Continuous care is needed due to the potential for reinfection.
13. Health workers are encouraged to use the integrated management of childhood infection (IMCI) guidelines. These have been shown to improve diagnosis and reduce mortality from common infections in children.

Congenital Syphilis

Symptoms of Congenital Syphilis

Another mother to child infection transmission is congenital syphilis. This is seen in neonates if maternal infection occurs after the fourth month of gestation. The causative organism is Treponema pallidum, which crosses the placenta barrier.

Classically, the infant at birth is found to have snuffles, skin eruptions and wide spread metaphyseal bony lesions. Interstitial keratitis is a common feature of congenital infection. Other symptoms include:

- Enlarged liver and spleen
- Jaundice
- Deformities of nails
- Alopecia, that is, loss of hair on the head
- Pseudoparalysis

Late congenital syphilis can also involve the central nervous system, bones, teeth and skin.

Management of Congenital Syphilis

Treatment of maternal syphilis in pregnancy prevents infection in the infant.

If the mother is VDRL positive at birth, intravenous or intramuscular antibiotic treatment is commenced immediately on diagnosis and the infant should be isolated for the first 24 hours (see syndromic management in unit six).

Hepatitis B Positive Mother

The Hepatitis B virus (HBV) is a common cause of hepatitis worldwide. It is transmitted by direct contact with blood or body fluids from infected persons.

The main sources of infection for infants are maternal blood during birth and any body secretions including breast milk. Ninety percent of the infected infants will become carriers of the virus who are at risk of developing hepatocellular carcinoma in the future.

Babies Born Before Arrival (BBA)

You have covered some of the conditions, especially infections in the mother, that put the infant at high risk. There is another category of infants that are at risk. These include infants born before arrival to the health facility and abandoned babies.
You have probably come across infants delivered on the way to the hospital or at home, who have developed some problems. Infants in this category are predisposed to several risks.

Try to list what problems face infants who are delivered on the way to the hospital or at home.
Some of the problems that the infant might be prone to are:

- Infections like pneumonia or tetanus depending on what was used to cut the cord
- Hypothermia if born on the way, without proper baby clothes
- Asphyxia due to inadequate resuscitation
- Injuries due to inexperienced hands conducting the delivery

Management of Babies Born Before Arrival
On admission, take the proper history (both obstetric and mode of delivery). Keep the infant warm. Provide nutrition for the infant. They should be started on antibiotics for both prophylacsis and for treatment. Check the cord, which may not have been handled properly by the person conducting the delivery. Measure the weight and conduct a first examination to exclude any abnormalities.

Abandoned Infants

You may also come across infants who are abandoned, either in or outside the hospital.
There are many reasons for individuals to abandon their newborns. These include:

- Economic pressures
- Unwanted pregnancy
- Babies born of incest
- Congenital malformations on the baby
- Sick mother, for example, psychiatric disorders
- Orphans (especially when the mother dies during delivery)
- Other social cultural and religious factors

These infants may not be sick but they may pick up an infection. Basic/preliminary investigations like blood tests for HIV, HBV and/or a full haemogram should be carried out to rule out any infections.
These infants should be cared for like any normal infant, while attempts are made to trace their relatives through a social worker. Arrangements for adoption, fostering or placement in children's homes should be made as soon as possible.
You have come to the end of the sub section on high-risk neonates. You looked at the various categories of high risk neonates, more particularly low birth weight infants, jaundiced babies and infants affected by different infections. You also looked at the issue of infants born before arrival and those abandoned

Neonatal Emergencies

Neonatal emergencies are conditions or situations that require prompt and accurate action by the midwife. The speed of these actions will often help determine the outcome for the baby. It is usually a matter of life and death and midwife's knowledge, skill and correct attitude go a long way in successful management of the situation.
You will now look at conditions that qualify as emergency situations, for example, asphyxia neonatorum, respiratory distress syndrome (RDS) and haemorrhagic diseases of the newborn among others. For all these conditions active resuscitation is necessary.
This subsection starts by looking at the resuscitation procedure.

Resuscitation of a Newborn

Resuscitation is an emergency measure taken to sustain life or to revive when life has just ceased. The aim is to establish the heart and lung function following cardio-pulmonary arrest. There are different levels of resuscitation.
First level resuscitation includes wiping of the face and body and flicking the soles of the feet to stimulate the baby.
Second level resuscitation involves:

- Clearing the airways
- Oxygen administration
- Mouth to mouth/bag and mask
- Intubation, that is, intermittent positive pressure ventilation (IPPV)

- Cardiac massage
- Drug administration

The principles of resuscitation of a newborn differ from the general principles of resuscitation. It is easier and better to prepare for resuscitation in the delivery room. Do remember that it is frustrating to start resuscitation and discover that the vital equipment is missing. The following are the essential requirements both in the labour ward and in the newborn unit:

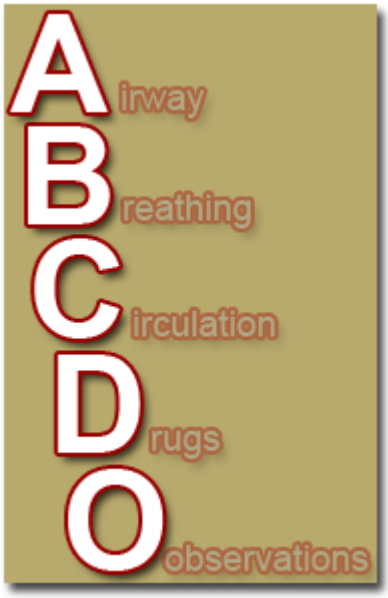
- A source of heat, for example, a radiant warmer or resuscitaire with bed located close to oxygen and suction outlets, but located away from draughts. Air conditioning outlets should also be present.
- At least two resuscitation trays, that is, one drug tray and one for catheters of various uses. The resuscitation and drug tray should include an airway, ambu bag, laryngoscope with blade, endo tracheal tube, suction catheters, needle, syringes, strapping tapes, gloves and cord clamps.
- Warm dry linen, stethoscope, and a wall clock are essential for the procedure.

Remember:
All equipment should be in the neonatal sizes.

As previously mentioned, a drug tray is necessary. The drug tray should contain the following items:

- Sodium bicarbonate 8.4% or 7.5% for correction of metabolic acidosis.
- Fifty percent dextrose for correction of hypoglacaemia (survival of the newborn infant correlates with glycogen stores).
- Adrenaline if the heart rate is falling after several minutes of vigorous resuscitative efforts; it may be given directly by cardiac puncture and then external cardiac massage started. This drug is also a vaso-dilator.
- Vitamin K helps in the prevention of bleeding and it is given in cases of prolonged bleeding time in the newborn, for example, haemorrhagic disorders, intracranial injury at birth, to any baby born through difficult labour and is generally recommended for all newborn infants.
- Aminophylline in small doses is given to aid in respiration if distress is present (3mg kg/body weight intravenously). This drug is a vaso-dilator and also stimulates the respiratory centre.
- Lorfan 0.25mg as an antidote to pethidine.
- Calcium gluconate can be administered intravenously and slowly to a baby who displays tetany due to calcium deficiency. It is also a cardiac muscle stabliliser.
- Source of oxygen to be administered after clearing the airway.
- Clean towels/wrappers to keep infant warm during resuscitation.

Principles of Resuscitation
You should be familiar with the ABCDO of resuscitation.



Airway should be cleared either by suction or positioning the infant.
Breathing, that is, establish respiration if not breathing.
Circulation should be noted through pulse, colour of mucus membrane and heart beat. Start cardiac massage if there is no heart beat or pulse.
Drugs (see the section on drugs used).
Observations to make a diagnosis.

Keep the infant comfortable and avoid exposure. At least two skilled persons are required to carry out the resuscitation.

1. In a normal case of vertex presentation, a well accepted practice is to clear the mouth and pharynx with a catheter. Immediately after delivery, the infant should be placed under a radiant warmer or wrapped in warm blankets.
2. The next step will depend on the condition of the neonate. All infants should be dried well to prevent hypothermia.
3. Clear the airway by removing the remaining upper airway secretions.

Remember:

Use short sharp sucks to prevent inhalation of mucus during the first gasp to allow the infant to obtain air. Mechanical suction should be gently done.

4. Administer oxygen by using a baby funnel or mask (not closely applied to the face) at two litres per minute. A stream of oxygen directed on the baby's face will stimulate respiration and provide high oxygen for the baby's first breaths. This should be applied for a short period.
5. Bagging with oxygen, if properly done, may be the only required form of resuscitation. The infant should lie flat on their back with shoulders slightly elevated and neck slightly extended. Insert the airway above the tongue and place mask around the mouth and nose, making certain that the mask fits tightly and that the neck remains extended during bagging. Rate of bagging should be 40 - 60 per minute. The operator or his assistant should listen to the lungs for heart and breath sounds.
6. In a severely depressed infant, proceed immediately with endo-tracheal intubation and/or umbilical vessel catheterisation.
7. External cardiac massage should be commenced if the heartbeat has not returned after three or four insufflations. This should be performed by an assistant leaving the primary operator free to manage ventilation.

The index and middle fingers are placed on the mid thorax at the level of the sternum and the area is pressed downward and released. Total downward displacement of the chest wall should not exceed one inch. This is because excessive vigour may cause ulceration of the liver with severe blood loss.

9. Alternate the two manoeuvres. The heart should be compressed two or three times (approximately 120 times per minute) after which a breath of oxygen is given. The two procedures must not be performed together (simultaneously).

The 'do nots' of neonatal resuscitation:

1. Hold the baby upside down
2. Perform routine aspiration of the airway
3. Perform gastric suction
4. Use sodium bicarbonate routinely

Asphyxia Neonatorum

Asphyxia is a very common word. But what does it really mean?

Try to write down your definition of Asphyxia.

There are various definitions that have been suggested. As you read them, see which one is closest to the one you wrote down.

Some of the definitions of asphyxia are:

- Failure to establish respiration at birth
- Depressed APGAR scores of less than 7 at 5 minutes
- A direct result of respiratory dysfunction, whether alteration from utero-placental function or from alterations in the neonate's ability to breathe independently

Foetal asphyxia can occur any time during gestation but is more common during labour and delivery.

Depression of the central nervous system of the foetus is the most common basic cause for failure to breathe at birth. However there are also maternal and foetal factors.

Try to think of at least three maternal factors, and three foetal factors, that would put an infant at risk of asphyxia.
Maternal factors include:

- Diabetes mellitus
- Isoimmunization
- Infection
- Third trimester bleeding
- Pregnancy induced hypertension or chronic hypertension
- Drug abuse
- Abruptio placenta
- Placenta previa
- Oligohydramnios
- Polyhydramnios
- Preterm labour
- Prolonged second stage of labour

Foetal factors include:

- Multiple gestation
- Congenital anomalies
- Intra uterine growth retardation
- Cord prolapse/cord round the neck
- Prematurity or post-maturity
- Malpresentation
- Prolonged rupture of membranes
- Operative delivery
- Foetal distress
- Meconium stained amniotic fluid

Remember:
The Apgar score gives some indication of the severity of asphyxia but resuscitation should never be delayed. Decision to initiate resuscitation should be based on the evaluation of the infant's respiration.

The signs of asphyxia will follow what is elicited on the Apgar scoring.
Management of Asphyxia
Immediate care is based on the ABC principles of resuscitation (airway, breathing, circulation) to initiate neonatal physiological adjustment. After active resuscitation continue with the following care:

- Keep the baby warm, noting colour, muscle tone and respiratory attempts.
- Auscultate the apex beat in order to determine whether the infant is improving or deteriorating.
- Handle the baby as little as possible but observe closely, every two to four hours for vital signs.
- Observe for signs of irritability, twitching, convulsions. If there are any, report without delay.
- Oxygen should be administered if cyanosis is present.
- The airway should be kept clear of mucus by frequent suction if there are any secretions.
- Withhold oral feeds until six to eight hours after resuscitation for baby to recover.
- Give antibiotics for prophylaxis.
- Advise the mother to attend the clinic for regular check up of the infant, because severe asphyxia may result in permanent damage to brain cells and cause mental retardation.

Prevention of Prenatal Asphyxia

Think about what you could do to prevent prenatal asphyxia
 Recognise high risk pregnancies early and take the appropriate action
 Accurately assess gestation when in labour in order to take the relevant precautions
 Assess pulmonary maturity before inducing labour if mother is to be induced
 Intrapartum foetal heart rate monitoring
 Active treatment of foetal distress in utero
 Ensure that a paediatrician, anaesthetist or other trained person is available to resuscitate the infant if necessary
 Assess foetal placental function, for example, ultrasound, foetal movement before delivery
 Discourage maternal use of alcohol and drug abuse
 Avoid use of respiratory depressive drugs during late first stage of labour e.g. pethidine

Respiratory Distress Syndrome (RDS)

Respiratory Distress Syndrome (RDS) or Hyaline Membrane Disease
This is a disease of prematurity caused by lack of pulmonary surfactant. The production of surfactant increases with gestational age. Lack of surfactant causes collapse of alveoli with each expiration. Thus, unlike in the normal lung, no residual capacity is established. For an infant with RDS, each breath is like the first, requiring high pressures to reopen collapsed alveoli.
Damage to the alveoli and pulmonary capillary epithelium, secondary to surfactant deficiency, causes the formation of a hyaline membrane consisting of fibrin and sloughed cells.

This further compromises gas exchange. Improvement will be evident in three to five days. Morbidity and mortality vary depending on gestational age.

Predisposing Factors

Try to list four disposing factors to Respiratory Distress Syndrome (RDS).

Did you include some of the following:

- Prematurity
- Infant of a diabetic mother. The neonate could be big, but preterm
- Antepartum haemorrhage
- Second twin, which, if delayed in delivery, may breathe while in utero
- Hypoxia, acidosis, shock
- Male infants are more prone to RDS than female infants for reasons not known
- Possibly Caesarean section neonates (many factors involved)

Clinical signs may occur immediately after birth or after several hours. The infant will present with:

- Grunting first, then cyanosis in room air, tachypnea, pallor, chest retractions and nasal flaring
- Decreased breath sounds and scattered rales
- Vital signs may be altered
- Tachycardia or bradycardia may be observed
- Hypertension and hypothermia
- Infant may become progressively hypotonic and oedema and oliguria also commonly develop within the first 48 hours

An x-ray usually shows the fine reticular pattern often referred to as 'ground glass'. Bronchograms are seen in the lung fields. The severity of the chest x-ray may not correlate well with the clinical severity of the RDS.

Management

If a premature birth is anticipated, administration of steroids (dexamethasone) to the mother 24 hours before delivery may be useful.

Full treatment will include:

- Immediate resuscitation.
- Oxygen therapy, which aims at maintaining the PO2 within the normal range. This is usually done in mild cases by increasing the inspired oxygen concentration.
- Chest physiotherapy after the second day of life in moderate and severe cases.
- Antibiotics if infection is a possibility.
- Appropriate fluid balance. Intravenous fluids should be given initially.
- Blood pressure monitoring.
- Minimal handling and nursing in the neutral environmental temperature. Infection prevention principles should be practised.
- Surfactant replacement therapy. The two commercially prepared surfactant products that have been approved for use by the Food and Drug Administration (FDA) are Survanta, a modified natural product, and Exosurf, a synthetic product.

Remember:

Dosages and methods of administration vary for the different products but both can be administered through endo-tracheal tube as per manufacturer's literature. Surfactant replacement reduces mortality by 5 - 12% in treated infants.

Improvement often occurs dramatically in infants with better prognoses. Other infants, usually those of smaller birth weight and lesser gestational age, require longer periods of respiratory assistance through intubation and may fail to improve as expected.

Apnoea

Apnoea is the cessation of respiration for 15 - 20 seconds when cyanosis, bradycardia, hypotonia or metabolic acidosis occur.

It differs from periodic breathing, during which respiration ceases for 5 - 10 seconds without pathophysiological changes.

Periodic breathing is a normal respiration pattern in the preterm infant but should have resolved as full term age is achieved.

Apnoea may occur because of immaturity of the respiratory and neural systems. Any infant who becomes apnoeic should be examined for an underlying cause. It is more likely to develop in premature infants and leads to the 'sudden infant death syndrome' (SIDS).

Management

Infants weighing less than 1750gm or at 34 weeks of gestation are at high risk for apnoeic episodes.

They should have their cardiac and respiratory rates, and oxygen saturations monitored continuously for their first two weeks of life or until five to ten days have passed without any apnoea. Apnoeic infants should also be quickly evaluated for bradycardia and cyanosis.

Immediate gentle tactile stimulation such as rubbing the back or flicking the soles of the feet stimulates respiration in most infants.

A bag and a mask connected to an oxygen source and equipment for suctioning and intubation should be at the bedside and ready for use in mechanical ventilation.

A respiratory centre stimulant, for example, theophylline may be used with a loading dose of 5mg/kg/day in divided dose. Caffeine citrate may be used in place of theophylline to treat apnoea in premature neonates.

Anaemia, which is a common cause of apnoea in preterm infants, should be corrected.

Haemorrhagic Disease of the Newborn (HDN)

This is a bleeding disorder commonly due to a temporary deficiency of the specific clotting factors, factor II (prothrombin), factor VII (proconvertin), factor XI (plasma thromboplastin component) and factor X (thrombokinase).

These factors are proteins, which need vitamin K to convert them into active clotting factors. Vitamin K is poorly transferred across the placenta, which means the foetus has low stores. Any stores are quickly depleted after birth. To enable normal clotting to occur, the baby should receive dietary vitamin K1, absorption of which will require fat and bile salts.

Vitamin K2 is synthesised by the bowel's normal flora and may also assist in the conversion of the proteins to active clotting factors. Since the neonate's bowel is sterile, Vitamin K2 production is restricted until colonisation has occurred. Because of deficiency of these active clotting factors babies are susceptible to haemorrhage. The condition may manifest in the following ways:

- Haematemesis
- Melaena stool
- Haematuria
- Umbilical cord bleeding

Bleeding usually occurs within the first four days of life and may be mistaken for the 'swallowed blood syndrome'. Bleeding occurs often in the mucous membranes of the intestinal tract and in the skin, where it is evident as bruises and on puncture sites. With severe bleeding, death can occur if appropriate measures are not undertaken.

Management

Babies who have HDN require careful investigation and monitoring to assess their need for treatment. The diagnosis is confirmed by a prolonged prothrombin time.

Remember:
Presence of streaks of blood in the vomitus or stool of a neonate should put the midwife on the alert.

The following measures should be taken:

- Seek medical care immediately.
- With massive bleeding, act sensibly and quickly. Take blood for investigations as well as grouping and cross matching as you wait for specialised care.
- Disturb the infant as little as possible and keep them warm.
- Treat for shock.
- If there is no doctor immediately available, administer vitamin K 1mg intramuscularly or intravenously to the baby after obtaining blood for investigations.
- Keep all soiled articles for assessment.
- Take blood for grouping and cross matching and prepare for transfusion (whole blood) if in hypovolaemic shock.
- In absence of haematemesis, feed the baby but if haematemesis is present, it is advisable to withhold the feed and give intravenous fluids.
- Maintain close observation for colour, pulse rate and bleeding sites. Note abnormal constituents of stools and vomitus.

Remember:
Prophylactically, Vitamin K 0.5 - 1mg by injection is recommended for all newborn infants.

Birth Trauma and Congenital Abnormalities

In this sub section you are going to look at some of the injuries sustained by the infant during labour or at delivery.
Some of these injuries may occur despite skilled obstetric care. However, in recent years serious birth injuries have become relatively uncommon, a reflection of improvements in perinatal care.
You will need to revise the diagrams on foetal skull as well as the landmarks. You are also going to look at a few of the abnormalities covered in paediatric care.
Birth injuries can be split into the following groups:

- Injuries to the head
- Intracranial injuries
- Peripheral nerve injuries
- Fractures of the long bones
- Organ injuries

The abnormalities include Down's syndrome and abnormalities due to substance abuse by the mother during pregnancy.
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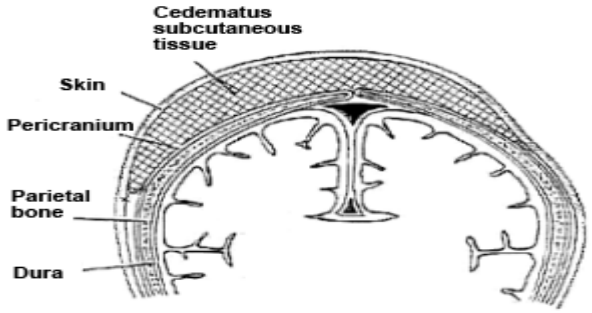
Injuries to the Head

Injuries to the head may vary from minor skin abrasions to severe internal haemorrhage.

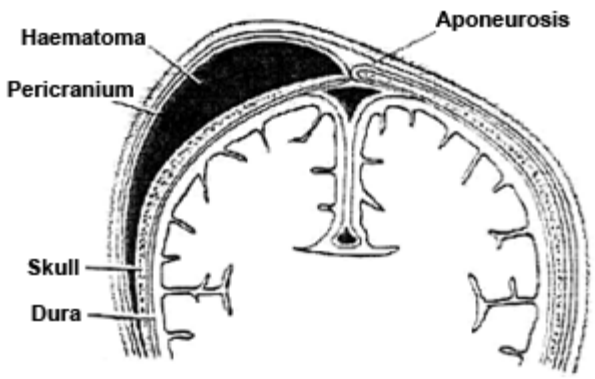


Caput Succedaneum

This is characterised by oedema of the subcutaneous layers of the scalp. The oedema lies
over the presenting part of the head as it passes through the birth canal. The swelling is maximal at birth and resolves within a few days. A localised caput or chignon may be produced if deliverywas aidedbyvacuum
extraction.
to
Remember:
The swelling is formed by oedema of the structureslyingsuperficial
the pericranium. It is not limited to one bone.

Cephalhematoma

This is sub periosteal haematoma, which most commonly lies over one of the parietal bones Spontaneous absorption occurs, but this may take
several weeks. No treatment is necessary.



Skull Fracture

This is rarely seen nowadays. Skull fractures used to occur in a parietal or frontal bone as a result of difficult forceps delivery. However, forceps delivery is now very rarely used. If it does happen, it is best to seek neuro surgical advice about the management.

Intracranial Injuries

Although traumatic intracranial injuries have become rare, they may occur following difficult instrumental deliveries of infants with malposition or breach deliveries. Preterm infants are particularly vulnerable, due to fragile bones.

Try to think of two causes for intracranial injuries.

Direct causes include the tearing of the intracranial membranes containing blood vessels. The membranes are the falx cerebri, that is, a fold of duramater which dips down between the cerebrum and cerebellum.

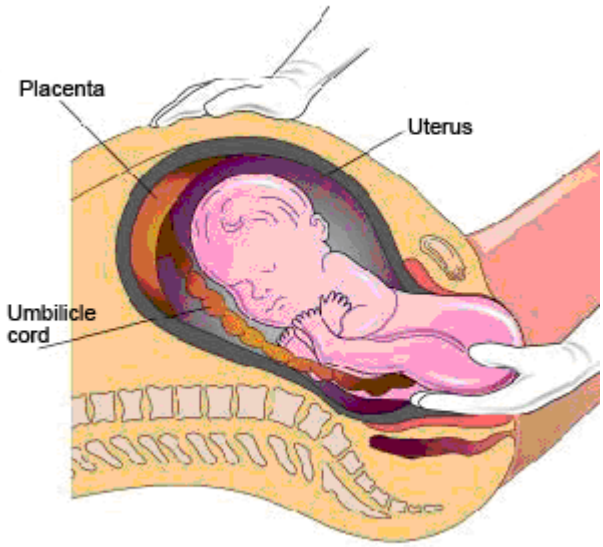
Indirect causes include anoxia leading to venous engorgement on the skull and rapid or an abnormal type of moulding caused by prolonged or obstructed labour or by instrumental delivery.

Infants associated with the following conditions are also prone to intracranial injuries:

- Premature labour
- Face to pubes presentation
- Breech delivery
- Asphyxia neonatorum

Signs of intracranial injury that will be manifested depend on the severity of the condition. On the other hand, the infant may not show all the signs.

Breach delivery



Breech birth

At birth some babies may cry and seem normal, then later show signs of cerebral haemorrhage.

A few infants are born in a state of white asphyxia. They are shocked and lie limply in the cot after responding to resuscitation. The signs include:

- Colour is pale
- Respirations show abnormal variations and the condition of the infant deteriorates with increasing depression of respiratory and other vital functions due to increasing cerebral haemorrhage
- The infant has a high-pitched cry
- In many instances, the condition gradually improves

Later signs of cerebral irritation may appear twelve hours after birth and are rarely seen later than the second or third day after delivery. They include:

- An infant who was limp and quiet after birth becomes restless. The child may be heard to utter a high-pitched, shrill or even piercing cry.

- The facial expression is that of an unnaturally wide awake baby.
- The brow is wrinkled, showing a deep frown, which increases with disturbance or movement.
- The infant is irritable and cannot tolerate handling, bright lights and sudden noise.
- The degree of muscular twitching or rigidity of the limbs varies. Stiffness of the neck or actual head retraction may be present.
- Sucking and swallowing reflexes are poor, with refusal to feed, or regurgitation during or after feeds.
- Temperature may be subnormal or high.
- Anterior fontanel may be bulging or feel tense on palpation.
- Vomiting, convulsions and sudden phases of intense cyanosis may occur in serious cases.

Periventricular Haemorrhage

This is predominantly a problem of preterm infants. The bleeding is around the ventricle. It is rarely seen in term infants but may accompany trauma and pre-natal hypoxia.

Subdural Haemorrhage

This condition may occur following trauma during the delivery of the preterm infant when there is increased compliance of the skull and a prolonged or precipitous delivery, especially with abnormal presentations. It results from damage to the superficial veins where the great vein of Galen and the inferior sagittal sinus combine to form the straight sinus. It may also result from laceration of the tentorium and falx, particularly at their junction. It is rarely seen in term infants.

Subarachnoid Haemorrhage

This haemorrhage is of venous origin. There is bleeding from the veins within the subarachnoid space, which may follow mild trauma or asphyxia at birth. The condition may be asymptomatic but can present with irritability or seizures during the first few days. Later hydrocephalus may develop.

To diagnose, CSF is uniformly blood stained. A CT scan is also required for diagnosis. Most infants require no treatment and their long term prognosis is good. It is only in rare instances of massive haemorrhage that the prognosis is poor.

Management

Infants born in a state of white asphyxia should be resuscitated and wrapped in warm clothing for transfer to hospital if in a health centre. In long term care, the baby is placed in a room selected for its quietness, warmth and protection from direct light and draughts. Clear the airway of excess mucus and keep the head slightly raised to avoid obstruction of the airway. The baby should be handled gently and quietness maintained where possible.

The type and method of feeding should be made according to the condition and ability of the individual baby. The infant's temperature should be taken and recorded four hourly and tepid sponging should be done if the baby has pyrexia. The infant's linen should be changed, and toilet needs met in the cot every three to four hours. Oxygen therapy, may be necessary so keep oxygen at hand.

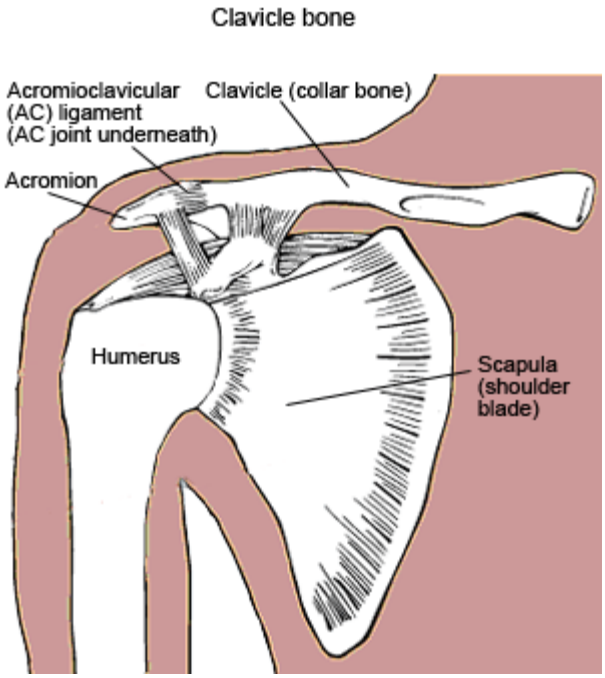
Many of these infants make good progress in the neonatal period, but not until much later is it possible to asses the degree of mental damage which has resulted from the trauma at birth. Therefore, they should be referred to the paediatric clinic for follow up.

Fractures of the Long Bones

These are uncommon nowadays. The clavicle is the bone most frequently broken. Injuries are usually noticed when the infant fails to move one arm as freely as the other because of the pain. Sometimes a lump can be felt over the bone from callus formation.

Other fractures, which can happen although uncommon, are fractures of the femur, usually humorous, during intrauterine manipulations.

Orthopaedic advice should be obtained for their management. Healing is usually rapid and complete.



Peripheral Nerve Injuries

Nerve injuries in the newborn infant may be due to stretching, compression, twisting, hyperextension or separation of the nervous tissue. All these are as a result of complicated labour and delivery.

Facial Nerve

This is damage to the facial nerve by pressure from the tip of the forceps. Palsy can also follow an apparent normal delivery. You will find that, on the affected side, the infant is unable to shut the eye completely. The corner of the mouth drops and the nasal-labia fold is less marked than on the unaffected side. When the infant cries, the mouth is drawn to the normal side. In most cases recovery occurs spontaneously within a few days.

Brachial Nerve Palsy

Injury to the brachial plexus may be due to excessive lateral flexion, rotation or traction upon the neck. This usually occurs during a difficult delivery, either from shoulder dystocia or a breech presentation. The clinical picture depends on the nerve roots involved.

If the roots of C5 and C6 are damaged, then Erb's palsy results (upper brachial plexus injury). The arm lies on the side of the trunk with internal rotation at the shoulder. The elbow is extended, there is pronation of the forearm and flexion at the wrists. Klumpke's palsy (lower brachial plexus palsy) occurs when the wrist and the finger flexors are affected resulting in a claw hand deformity with wrist drop and limb fingers the upper arm is unaffected. The spinal root C8 and T1 are affected.

However, these injuries are increasingly uncommon, given improvements in reproductive health care. There is no treatment for brachial plexus injuries. However, passive movements of the joints will prevent contractures. Mild injuries recover within a few days,while more severe lesions can be expected to recover spontaneously
in two to four months. Occasionally, there is incomplete recovery.

Radial Nerve Injury

This type of injury is rare but may result from fracture of the humerus, especially with difficult delivery of the arm during breech extraction. The use of the 'deltoid region' as a site for intra-muscular injection (now usually avoided) results in a radial nerve injury, because the deltoid muscle of the newborn infant is so small that correct
localisation of the needlepoint is difficult.

Organ Injuries

The following injuries to the internal organs may occur, especially with difficult deliveries like breech extraction:

- Liver and spleen may rupture, especially when there is hepatosplenomegaly (rhesus haemolytic disease, diabetic infants)
- Adrenal haemorrhages may occur, but are usually a post mortem finding, being unsuspected in live infants
- Kidneys may rupture during delivery in breech
  preterm infants
- Testicles may be bruised and haemorrhages commonly seen in breech presentation

You might have realised by now that difficult deliveries will lead to complications. That is why

there is a need for diligent observation and for early intervention in order to avoid or prevent injury to the newborn infant. You may have realised that there is very little in the form of treatment. Thus, prevention is better than cure.

Congenital Abnormalities

Congenital abnormalities are structural deformations present at birth.
Approximately 1.5% of babies are born with congenital abnormalities, especially congenital heart disease, which becomes evident when the baby is older.
A number of malformations are now recognised prenatally from routine ultrasound scanning or prenatal testing of the foetus.
When a baby is born with a defect, the parents are shocked and upset and ask for reasons. Thus, it is important to have an overview of the events that can change the normal pattern of foetal growth and development so that you can counsel the parents.
Most of these defects have unknown causes but are believed to be due to:

- Genetics
- Adverse effects of drugs on the foetus
- Radiation, metabolic disturbances in the mother
- Lack of space for the foetus to grow, for example, oligohydramnios
- Infections affecting the mother

In this section you will only cover chromosome disorders. The other disorders, such as gastrointestinal tract and central nervous system malformation, have been covered in module one. You will also look at the effects of substance abuse in the development of the foetus.

Chromosome Disorders

Every cell in the body contains 46 chromosomes (diploid number) in its nucleus. Forty-four are autosomes (xx or xy). Half (the haploid number) are derived from each parent at the time of fertilisation. During meiosis, the chromosomes separate and align themselves around the centre of the cell and half migrate into each daughter cell. Occasionally, one of the chromosomes does not separate in time (non-disjunction) and stays with its partner in one daughter cell, leaving the other daughter cell with no chromosomes of this type. Sometimes a process known as translocation occurs where part of one chromosome is added to another during the crossover process of meiosis.

Specific chromosomal abnormalities, which have been identified, include:
For the purposes of your study, you will only cover the first one.

Trisomy 21	Down's syndrome
Trisomy 14	Patau syndrome
Trisomy 18	Edward's syndrome
xo syndrome	Turner syndrome, ovarian dysgenesis
xxy syndrome	Klinefelter syndrome

Down's Syndrome (Trisomy 21)

Down's syndrome is the commonest chromosomal disorder occurring in 1.4 per 1000 live births. It results from the presence of 47 chromosomes since the infants have three number 21 chromosomes. The majority (95%) are the result of non dysjunction during mitosis. The risk increases with maternal age from 1:350 at 35 years to 1:100 at 40 years and 1:30 at 45 years. Another 3 - 4 percent are due to translocation and are not related to maternal age.
If translocation affects the mother, there is a 20% risk of an affected child. If it affects the father the risk is about 6%. One or two percent are mosaic, that is, with a normal cell line as well as a cell line with an extra 21 chromosome. Chromosome analysis can be done on samples obtained by chorionic villus sampling, or amniocentesis in women at increased risk because of maternal age, or where either parent has a chromosomal translocation.
The characteristics of Down's syndrome are numerous and include:

- Eyes which slant upwards and outwards with epicanthic folds slit eyes
- A round face, small mouth with protruding tongue and a shorter upper lip
- Low set ears, flat occiput
- Palpable third fontanelle
- Hands which are short with incurving of the little finger and single transverse palmar crease (simian crease)
- The cleft between the great toe and the others is great.
- Profound hypotonic
- Increased incidence of duodenal atresia and congenital heart disease
- Many affected individuals tend to have a low intelligence quotient (IQ)

The survival of a baby with this disorder depends on associated malformation but survival rates are usually good. In management, a multi professional approach will be needed because these children have many needs to be addressed.

Drug or Substance-Addicted Infants

If a mother abuses drugs during her pregnancy, the infant may be born with withdrawal symptoms, known as Neonatal Abstinence Syndrome (NAS). These drugs include narcotics, alcohol, barbiturates, codeine, benzodiazepines, cocaine and tricyclics antidepressant. The abuse of such drugs is associated with foetal and neonatal deaths, prematurity and intrauterine growth retardation. There is also an increased risk of sudden infant death syndrome (SIDS).

According to Ellwood and others (1987), the risk of SIDS is increased five fold by maternal narcotic addiction. Pregnant drug abusers often have chaotic lifestyles with accompanying social and economic problems. Hence they are at more risk of STIs/HIV and Hepatitis B virus. Therefore, this puts the mother and baby in the risk group.

Neonatal Abstinence Syndrome (NAS)

As mentioned earlier, infants born to drug abusers are born with withdrawal symptoms. You should, therefore, look out for the following signs of withdrawal:

- Tremor, high pitched cry, irritability
- Hyperactivity, hyper tonicity
- Sweating, pyrexia, convulsions
- Sneezing, vomiting, disorganised sucking
- Diarrhoea
- Respiratory distress

In opiate misuse, the symptoms of NAS will generally appear within the first 24 – 48 hours of life, but they have been reported to take up to six days to appear. Methadone and barbiturates abstinence signs may not appear for two weeks and may go up to a period of several weeks or months.

Nursing Care

Infants should be nursed in a quiet environment with reduced light and noise stimulus. Cuddle the baby so that it feels secure and give small frequent feeds for comfort and adequate nutrition. Control convulsions by giving phenobarbitone syrup. Give intravenous fluids if feeds are not tolerated.

Medical Treatment

This varies in different countries depending on the drug misused and severity of presenting signs. However, the following may be used:

- Narcotics, giving 0.05mg/kg of morphine every 3 - 4 hours, increasing dosage if necessary until the observable signs are controlled (Roberton, 1993).
- In the UK the sedative chlorpromazine is also used starting at 3mg/kg/24 hours in divided doses increasing dose until presenting signs are controlled.

The midwife's role includes:

- Build up a good working relationship with the mother
- Communication should be clear and non judgmental
- Explain the baby's presenting signs and emphasise that the behaviour is not a rejection of their parents
- Encourage parents to take active part in the care of their baby
- Emphasise the possible effects of breast feeding, which would be harmful especially with cocaine and heroine. Parents should seek advice from pharmacist
  or paediatrician
- On discharge, you should coordinate the follow up and refer to appropriate professionals for rehabilitation

Foetal Alcohol Syndrome (FAS)

It is clear that heavy alcohol use results in the foetal alcohol syndrome. Alcohol also affects brain cells size, resulting into a smaller mass of tissue. FAS is characterised by:

- Intra uterine growth retardation
- Failure to thrive
- Developmental delay and dysmorphic facial features
- It is thought that ethanol (a component of alcohol) disrupts cell differentiation and growth in the foetus and also impairs normal placental function

The infant, therefore, will present with the following:

- Small eyes with exaggerated epicanthic folds
- Shallow or absent philtrum with a poorly formed nasal bridge
- Ears that appear large

- The infant may be fretful and difficult to feed
- Other associated abnormalities of the heart and musculoskeletal system, gut atresia, skin lesions and cleft palate
- Delay in mental and motor development and hence learning and behavioural problems

The midwife's role is to identify women at risk and give effective antenatal education on effects of structural defects that occur during period of organogenesis. It is important for the pregnant woman to know that these defects are irreversible. You should also monitor signs of alcohol withdrawal and prepare for follow up in the community after discharge.

Remember:

Improved nutrition, decreasing cigarette use and abstinence from alcohol greatly improve the foetal brain's chances of growing.

Remember that other drugs/substances such as tobacco, caffeine and cortisones that are abused during pregnancy can also lead to a foetal problem. You should now be able to identify a newborn with Down's syndrome and problems that result from substance abuse and take the appropriate action.

UNIT THREE PART TWO: ABNORMAL LABOUR AND PUERPERIUM

In part two of this unit you will focus on some of the common problems that occur due to abnormalities in labour, such as; multiple pregnancies, common abnormal presentations including breech and shoulder presentation and positions including the occipito-posterior. You shall look at how these conditions present and your role as a midwife in preventing the problem from getting worse.
This unit is composed of five sections:
Section One: Multiple Pregnancies
Section Two: Abnormal Uterine Action
Section Three: Trial of Labour, Induction of Labour and Prolonged Labour
Section Four: Abnormal Puerperium
Section Five: Obstetric Anaesthesia Operations and Emergencies
Unit Objectives

By the end of part two you will be able to:

- Describe the management of multiple pregnancy
- Describe the management of abnormal uterine action
- Explain the process of managing trial of labour
- Describe the management of foetal malpositions
- Describe the management of foetal malpresentations
- Explain the management of puerperal sepsis
- Describe the management of breast complications
- Explain how to manage mental health conditions related to pregnancy and childbirth

SECTION 1: MULTIPLE PREGNANCIES

Introduction

Multiple pregnancy is a term applied when there is more than one foetus in the uterus. The incidence of multiple pregnancies is rare. It is estimated that twin conception occurs spontaneously once in 90 pregnancies, triplets once in 310,000 while quadruplets occur once in 700,000.

Objectives

By the end of this section you will be able to:

- Define multiple pregnancy
- Explain the two different types of twins
- Diagnose twin pregnancy
- Describe the effect of multiple pregnancy on pregnancy
- Describe the management of multiple pregnancies

Multiple Pregnancies

Varieties of Twins

Twins may be binovular or uniovular. Binovular twins are developed from two separate ova, which may or may not come from the same ovary. Uniovular twins are developed from a single fertilised ovum, which undergoes division to form two embryos.
Below is a comparison of the two types of twins.

Uniovular twin (monozygotic)	Binovular twins (dizygotic)
One ovum	Two ova
One spermatozoon	Two spermatozoa
One amnion	Two amnions
One chorion	Two chorions
One placenta	Two placentas (may fuse)
Same sex	Same or different sexes
Identical	May be different in appearance

Diagnosing a Multiple Pregnancy

On Inspection

- The abdomen looks larger than it should at the given date
- Polyhydramnios may increase the abdominal size leading to confusion of the diagnosis

On Palpation

- Abdominal girth will be 101.5 or more centimetres
- Fundal height is larger than dates from twentieth week of gestation
- You will reveal two foetal poles on fundal palpation
- The size of the head is smaller than the size of the uterus
- You will palpate an unusual number of foetal parts

On Auscultation

- Two foetal hearts are recorded simultaneously and there is a difference of 10 to 20 beats

Ultrasound Scan

An ultrasound scan at seventh week can distinguish two separate sacs while from the twelfth week two foetal bodies can be identified. On the fourteenth week, two heads can be detected.

Note: Two skeletons are visible on x-ray at thirty weeks.

Effects of Multiple Pregnancy

The effects of twins on pregnancy include:

- Preeclampsia is three times more common in multiple pregnancies than a single pregnancy
- Anaemia is more common, due to the increased foetal demand of folic acid and iron dietary requirement
- Polyhydramnios could occur due to more fluid in the two foetal sacs
- Pressure symptoms are more marked, and may include backache, oedema, varicose veins, indigestion, constipation, dyspnoea and bladder irritability
- Minor disorders of pregnancy are more marked, including headache, morning sickness and vomiting
- Premature labour is likely, due to over stretching of the uterus
- Congenital malformation occurs twice as much than in single pregnancy
- Intrauterine growth retardation may occur due to placenta insufficiency

Complications of twins in pregnancy include:

- Malpresentation, where 35% of twins will both present by the head, and another 35% by head and breech. 10% present by breech and/or 20% present by transverse lie or cephalic with transverse lie
- Delay in the birth of the second twin
- Cord prolapse, which occurs especially with the second twin, often when there is malpresentation
- Maternal and foetal distress is common due to prolonged labour
- Locked twins is a rare complication but may prevent spontaneous delivery
- Postpartum haemorrhage due to large placental site

Multiple Pregnancy Management

Management During the Antenatal Period

Intensify the care of the mother of twins by ensuring the following:

- See the patient every two weeks from the 20th week
- Check blood haemoglobin levels at 30, 36, 37 weeks before labour to exclude anaemia
- Relieve any discomfort by advising on remedies for minor disorders of pregnancy
- Advise on diet to prevent anaemia
- Advise on the need for at least two hours rest in the afternoon and six to eight hours rest during the night
- The practice of admitting the patient between 30 to 36 weeks is now uncommon. It was necessary where home conditions were poor. It was intended for improving foetal growth through increased placental blood flow following enough rest in the hospital
- Improve maternal nutritional status

- Never allow the pregnancy to go post mature (post date) due to the danger of placenta insufficiency

Management During First Stage of Labour

All cases of multiple pregnancy should be delivered in hospitals due to complications that may occur during labour. The following procedure should be followed:

- Take blood for grouping and cross match
- Avoid over sedating the mother during labour
- Prepare your delivery trolley with pairs of instruments for two babies. You should have a resuscitation trolley, baby labels, ergometrine or syntometrine in a syringe
- Put up the oxytocin drip if uterine action is not proving very effective
- Monitor and assess the progress of labour
- Delivery room must be warm
- Time the episiotomy properly
- Check foetal heart beats between each contraction
- Advise on ambulation if membranes are intact
- Encourage the mother to empty her bladder
- Reassure the mother
- Be friendly and display positive attitudes towards the mother and her family members

Management During Second Stage of Labour

Ensure that the following procedure is followed when managing the second stage of labour:

- It is preferable to have an obstetrician, paediatrician and anaesthetist present during the delivery.
- Preparations should be made for resuscitation and special care in case of low birth weight.
- Operating theatres should be ready to receive a mother at a short notice in case of emergency caesarean section.
- Deliver the head of the first twin slowly, clear the airway and hand the baby to the assistants.
- The assistant should label the baby and write ‘first twin’ or ‘twin one’.
- The lie of the second twin is checked (if longitudinal), then the presenting part is checked. If high, the presenting part is pushed down by fundal pressure and the membranes are ruptured.
- The mother is encouraged to push with each contraction and the baby should be born within 45 minutes.
- Oxytocin can be given immediately after delivery of the anterior shoulder of the second twin. It may also be administered after delivery of the placenta.
- As soon as the oxytocin takes effect, the uterus contracts.
- Both cords are taken simultaneously. The placenta and membranes will be delivered using control cord traction.

Complications in the Delivery of Twins

Management of Delayed Twin

Should you be confronted with a case of a delayed twin, the following steps should be taken:

- Ascertain if the lie is longitudinal.
- Assess the contraction and, if poor, ask your assistant to commence syntocinon drip to stimulate contraction.
- Encourage the mother to push during contraction.
- Vacuum extraction may be done when the doctor comes.

Management When Second Twin Lies in Transverse

You must ensure that you follow this procedure should you be confronted with a case where the second twin is lying in transverse:

- Send for the doctor.
- Attempt external version when the membranes are intact.
- If you succeed in performing the external version, rupture the membranes and encourage the mother to push the baby.

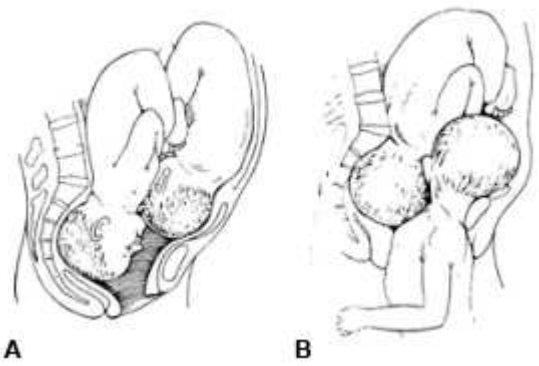
Remember: In case you do not succeed, the doctor will perform an internal version and deliver the baby in breech.

Expulsion of the Placenta or Bleeding Before Second Twin

If the placenta is expelled soon after the first twin or there is bleeding:

- You should deliver the second twin as soon as possible by using fundal pressure in case of longitudinal lie.

- If this is not possible, inform a doctor as soon as possible and prepare the mother for caesarian section.
- Locked twins are very rare. To facilitate the birth of the second twin, decapitation of the first twin is necessary, but caesarean section for delivery of the second twin is the easiest and safest method.



Conjoined Twins
A case of conjoined twins usually requires a cesarean section. At times separation of the conjoined twins is possible.

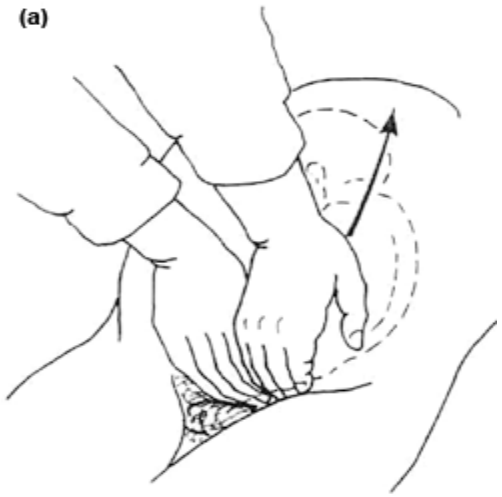
Version

This is turning the foetus from an undesirable position to a desirable position. The two types of version are external version and pondalic (or internal) version.

External Version
This is the external manipulation of the foetus through the abdomen and the uterine walls, used to correct malpresentation. The procedure is successful when done a month before term. Unfortunately, it is often felt that the foetus returns to its original position after a few hours. This procedure is outdated as caesarean section is recommended in malpresentations. It is now used by a midwife only in the delivery of the second twin in the case of transverse lie.
External version is contraindicated in the case of antepartum haemorrhage, high blood pressure, rhesus negative mother, previous scars and twin pregnancy.

Preparation
- Reassure the mother by explaining the procedure
- Make sure the bladder is empty
- The mother lies with partial flexion of the thighs to relax her abdominal muscles
- Sprinkle powder on her abdomen to prevent friction during the movement
- Engage the mother in conversation during the procedure to divert her attention so as to be relaxed. (Some doctors order valium one to two hours before the procedure)

Disengage Breech
The doctor will locate the head and the back and disengage breech by pushing the breech upward with the fingers of both hands. Refer to the diagram on the right.



Make the Foetus do a Forward Somersault
Using steady pressure with one hand press upwards, turn the foetus laterally while the other hand presses on the head displacing it in the direction, which will increase flexion. (Follow the foetus' nose otherwise you will extend the head.)

Post-Version Steps

- Take the foetal heartbeat immediately after the version. For the first few minutes there may be alteration of the heartbeat but it will pick up within a few minutes.
- Observe the mother for three hours.
- If there is no bleeding per vagina, draining of liquor or contraction, advise the mother to report back after one week unless any problem arises.
- If the mother is rhesus negative, anti D should be given within the first 72 hours.

Pondalic Version

This is a manoeuvre designed to change any existing presentation to breech presentation. It is also known as internal version. This manoeuvre is useful in delivery of delayed or transverse second twin. It is now never used in any other circumstances.

While the cervical os is fully dilated, the whole hand is introduced high in the uterus. The baby's feet are grasped and pulled in the direction of the birth canal. The other hand helps to turn the foetus by pushing the head up at the fundus. The version is followed by breech extraction.

Care During Puerperium

For the mother with multiple births, involution is usually slow. The after pain is also often more troublesome. Care of the babies can be a major problem, so the mother should be initially helped with the feeding of the babies. Teach the mother how to feed so that she feels competent when discharged. For more detailed information see the section on Care of Normal Puerperium.

SECTION 2: ABNORMAL UTERINE ACTION

Introduction

Before you begin this section, it is recommended that you review the normal uterine function as you learnt it in the physiology of labour. This section explores abnormalities in uterine action, their causes and management.

Objectives

By the end of this section you will be able to:

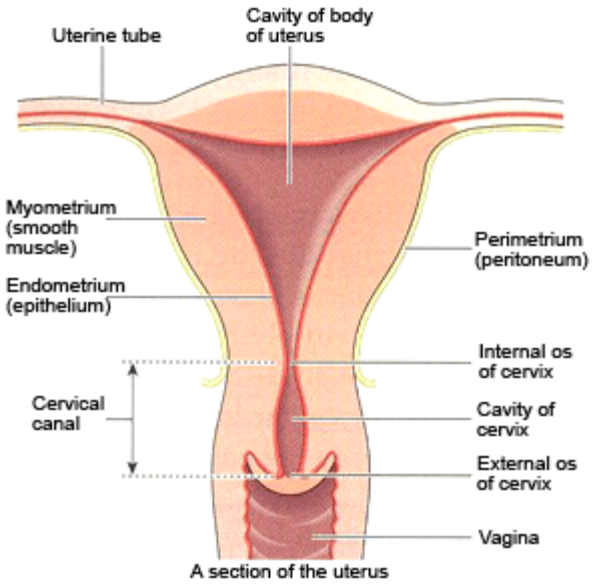
- Explain the concept of abnormal uterine action
- Analyse the different types of abnormal uterine action
- Identify causes of various types of abnormal uterine action
- Describe the management of each type of abnormal uterine action

Abnormal Uterine Action

Abnormal uterine action is a dysfunction of uterine muscles due to neuromuscular disharmony. Some types of abnormal uterine action include:

- Hypotonic uterine action
- Incoordinate uterine action, including hypertonic lower uterine segment, constriction ring dystocia, colicky uterus and spurious labour
- Cervical dystocia
- Precipitate labour

You will now explore each of these conditions in more detail.



A section of the uterus

Hypotonic Uterine Action

This is poor tone in the uterine muscle fibres which results from weak/short contractions. The contractions are infrequent and cause less pain. The uterus may be indented at the height of a contraction. Both mother and baby are affected by the contractions. The effects of weak contractions bring about very slow or no cervical dilatation. This results in prolonged labour.
There are two types of hypotonia; primary and secondary uterine inertia also respectively known as primary and secondary hypotonia. Primary hypotonia starts at the onset of labour. The cause is unknown and it is common in primigravida. Secondary hypotonia occurs when labour has already been established. The uterus is exhausted and contractions slow down, due to:

- Retained second twin
- Cephalopelvic disproportion
- Malpresentation or malposition
- Effect after epidural anaesthesia

Management of Hypotonic Uterine Action
Admit the mother in hospital or transfer to a hospital if she is in a health centre. Reassure her and then sedate her to reduce anxiety and calm her down to sleep. You should perform an abdominal and pelvic exam to exclude cephalopelvic disproportion. Determine the cause of OPP. If this is present she should be prepared for a caesarean section.
If there are no uterine contractions, these should be stimulated by administering an enema or repeat administration if it had been given previously.
You should check on the following factors:

- Frequency, strength and duration of the contractions
- Vital signs, that is, maternal pulse and BP and general condition
- Foetal heart rates
- Descent of the presenting part

A vaginal examination is done every two to four hours to determine cervical dilatation. The urine is tested every two hours for sugar, acetone and albumin. If there is foetal or maternal distress in the first stage of labour, the mother is prepared for caesarean section. However, if the mother is in the second stage or nearing second stage and contracting and dilating well, the delivery can be assisted by vacuum extraction.
The possibility of post partum haemorrhage should be kept in mind. Hence an intramuscular injection of syntometrin 1ml should be given at the birth of the anterior shoulder or egometrin at the crowning of the head.

Incoordinate Uterine Action

In cases of incoordinate uterine action, there is alteration in the polarity of the uterus with an increase in the resting tone. The uterus is very irritable. The contractions are strong, painful and erratic but in spite of strong contractions, the cervix dilates slowly. Clinically, the patient experiences a lot of pain both before and after contraction. She is exhausted and bears down early due to severe backache. This may lead to retention of urine. Foetal hypoxia occurs due to the hypertonic state of uterus, which interferes with the placental circulation.
On Vaginal Examination (VE) the cervix is noted to dilate slowly despite frequent painful contractions. The cervix is tight, unyielding and oedematous since the mother bears down with each contraction. There are four varieties of Incoordinate uterine action, which will be explored on the next page.
There are four varieties of Incoordinate uterine action described below.

Hypertonic Lower Uterine Segment
In this case, the lower uterine segment is hypertonic. There is loss of polarity and intermittent abdominal pains. The pains occur before and persist long after a uterine contraction. The cervix fails to dilate.

Colicky Uterus
The upper uterine segment contracts strongly and spasmodically. As a result of the different parts of the uterus contracting differently the cervical dilatation is ineffective. There may be reduced placental blood flow leading to foetal distress.

There is intense clump-like pain, contractions are not effective and the uterus is tender. The mother may not experience severe backache.

Constriction Ring Dystocia
This condition happens one in every thousand labours (Myles, 1999). It is a localised spasm of a ring of muscle fibres. This is a result of disorganised uterine action. It is commonly found near the junction of both the upper and lower uterine segment. It usually embraces a narrow part of the neck of the foetus. It may happen at any stage of labour but if it occurs in the third stage, it is known as an hourglass constriction.
The spasm may be triggered by an early rupture of membranes. The hypertonic uterus is irritated by being moulded round the foetus or by interuterine manipulation.
The condition can be diagnosed vaginally when there is a delay in labour. There is no advance of the presenting part and the upper segment feels tender to the touch. Inhalation of amylnitrate or 10ml of 2% IV magnesium sulphate solution may relieve spasms.

Spurious Labour
Spurious labour is a condition where contractions occur before the onset of labour, which are painful and are accompanied by backache. Giving pethidine or morphine 1ml to relax the uterine contractions can abolish them. This differentiates it with true labour.

Management of Incoordinate Uterine Action
Cephalopelvic Disproportion (CPD) is usually the underlying cause of this condition. Malpresentation should be ruled out through an abdominal and vaginal examination.
If malpresentation is present, the patient should be prepared for a caesarean section.
If CPD is not present, she may be allowed to continue in labour. Close observation is carried out and a record of observations should be maintained.
Reassure the mother to allay anxiety. Make observations of the foetal heart rate, maternal pulse, and respiratory rate half-hourly. Blood pressure should be taken every four hours and urine testing should be done every two hours. Any signs of maternal/foetal distress; dehydration and ketosis, should be reported promptly and may be corrected by giving intravenously (IV) 5% dextrose alternating with normal saline. You should always maintain an intake and output record.
Sedate the mother to relieve pain, calm her down and enable her to sleep. Epidural analgesia is very effective in prompting normal uterine action (or pethidine if added to the drip).
A low dose of 0.5mg syntocinon drip can be given. If, after four to six hours, there is still no progress, the mother should be prepared for a caesarean section.
A small proportion of mothers with Incoordinate uterine action may end up in normal delivery or vacuum extraction. The midwife should be able to make the correct judgement call.

Cervical Dystocia

Cervical dystocia can be divided into two classes; primary and secondary.

Primary Cervical Dystocia
In primary cervical dystocia, the uterine contractions are normal. The presenting part is low down in the pelvis but the cervix fails to dilate. The delay is due to the formation of a cartilaginous ring round the cervix.
This condition occurs mainly in primagravida whereby the first stage is prolonged and there is severe and persistent backache. On vaginal examination the cervix feels thin, tight and unyielding.

Secondary Cervical Dystocia
This type occurs due to previous trauma to the cervix, for example, tears which were repaired, scarring or from infection. The cervix fails to dilate in spite of good uterine contractions.
The management of cervical dystocia is by encouraging the mother to lie on her back, elevation of the bed foot to ease pressure on the cervix and care must be taken to avoid lacerations. Caesarean section should be done to hasten delivery of the baby.
Cervical dystocia can be further divided into one of three types, any of which can occur as primary or secondary cervical distocia.

Rigid cervix
Rigid cervix is a rare condition in which the cervix fails to dilate despite normal uterine contractions. It is characterised by severe persistent backache. On vaginal examination the cervix feels thin, tight and unyielding.

Annular detachment of the cervix
Annular detachement of the cervix is characterised by persistent and prolonged pressure on the rigid cervix, which causes ischemia. The necrosed ring of the cervix is detached and expelled and contributes to a uterine rupture.

Oedematous anterior lip of cervix
Oedematous anterior lip of the cervix involves the anterior lip being nipped between the foetal head and the pelvic brim. It becomes swollen due to pressure. On vaginal examination the oedematous cervix feels like a firm ridge as thick as a finger. It may also be seen at the vulva as a bluish glistering cervix. It delays the first stage of labour, as the cervix does not dilate quickly.

Precipitate Labour

In the case of precipitate labour, the contractions are strong and frequent from the onset of labour. This results in an abnormally rapid progress of labour and delivery may occur within an hour from the onset of labour.
There are several types of complications, which can occur.
Maternal complications include cervical and perenial lacerations. The uterus may fail to contract during the third stage of labour, leading to a retained placenta. Post partum haemorrhage, uterine inversion, shock and collapse may occur due to sudden relief of pressure.
Foetal complications include foetal hypoxia, which may occur as a result of frequent and strong contractions. Rapid moulding may result in intracranial pressure and, during delivery, this may lead to intracranial haemorrhage. Asphyxia may occur due to rapid expulsion of the baby's unmoulded head.

Remember: Precipitate labour tends to recur. Therefore, with future pregnancies the mother needs to be admitted early into hospital for safe delivery.

Over-Stimulation of the Uterus

This may occur as a result of excessive use of syntocinon or prostaglandin, which may cause tetanic contractions with inadequate periods of relaxation.
Complications of over-stimulation of the uterus include foetal hypoxia. If uterine spasms that reduce the transfer from the placenta of foetal oxygen are not treated, foetal death may occur. Other complications include precipitate labour and rupture of uterus in cases of disproportion.
Methods of management should include the following:

- Stop the administration of syntocinon or prostaglandin
  at once
- In case of tonic contractions, the patient should be given two puffs of ventolin inhaler
- If there is foetal distress, give dextrose IV and oxygen by mask

Tonic Contractions
This is where the contractions are excessively longer, stronger and more frequent. This results in almost continuous contractions with short periods of relaxation. Tonic contractions are caused by cephalopelvic disproportion. The uterus attempts to overcome the obstruction and so it increases its strength and frequency. The condition is common in primigravidae.
Possible complications of tonic contractions include the rupture of the uterus and foetal death due to prolonged labour.

Management of Tonic Contractions
If the patient is on syntocinon drip, it should be discontinued and the doctor informed. The vital signs, including observations of pulse and blood pressure, should be monitored carefully.
There are several factors, which predispose to abnormal uterine action, these include:

- Age, the elderly primigravida is more likely to have abnormal uterine action
- Parity, the condition is more frequent in primigravida
- Cephalopelvic disproportion or malpresentation OPP, which may either cause hypotonic uterine action or incoordinate uterine action
- Post maturity

- Other factors like over distension of the uterus in multiple pregnancy
- Early rupture of membranes
- Emotional tension of the patient

SECTION 3: TRIAL OF LABOUR, INDUCTION OF LABOUR AND PROLONGED LABOUR

Introduction

This section examines difficulties that can be experienced during labour, how labour can be induced and the conditions of prolonged and obstructed labour.

Objectives

By the end of this section you will be able to:

- Define trial of vaginal delivery
- Explain foetal distress
- Describe the different methods used in induction of labour
- Describe management of prolonged labour
- Explain the complications of prolonged labour
- Describe the preventive measures of prolonged labour
- Explain the concept of obstructed labour
- Identify signs of obstructed labour
- Describe the management of obstructed labour

Trial of Labour

Trial of labour is a test of labour conducted where there is a minor or moderate degree of Cephalopelvic Disproportion (CPD) in which it is difficult to decide whether delivery per vagina is possible.

Factors influencing good prognosis

There are several factors influencing good prognosis. These are:

- Strength of the uterine contractions
- Flexion of the head
- Degree of moulding of the foetal head, that is, reduced engaging diameters
- The giving of pelvic joints. In pregnancy, the joints of the pelvis are relaxed and separate by half to one centimetre
- Maternal courage

Factors influencing poor prognosis

The factors influencing poor prognosis are:

- Early rupture of membrane which may be accompanied by prolapsed cord
- Poor moulding of the head
- Maternal or foetal distress which will necessitate intervention on trial of vaginal delivery

Remember: Do not hesitate to terminate the trial of labour when there is foetal or maternal distress.

Contraindications for trial of labour

Compare the following list of contraindications for trial of labour with those you learnt in normal labour:

- Grossly contracted pelvis
- Medical or obstetrical complications
- Malpresentations, for example, breech
- Elderly primigravida
- Cases where trial of labour failed before
- Cases of two previous caesarean sections

Remember: Your encouragement and friendly attitude will boost the mother's morale.

Management of Trial of Labour

Explain the situation to the mother and prepare her for possible operative intervention. Assess patient carefully on admission to ascertain the following:

- Whether the mother is in established labour
- Presentation of foetus
- Check for flexion of the head
- State of foetal heart, that is, rate, rhythm and volume
- General condition of mother physically and emotionally
- Confine the mother to bed to prevent early rupture of membranes
- Close observations of temperature and blood pressure every four hours
- Observe foetal heart rate and maternal pulse quarterly to half hourly

You should always observe for signs of foetal and maternal distress. Accurately observe and record for onset, strength, frequency and duration of the contractions. Closely observe the descent of the head every one to two hours per abdominal palpation by the same midwife if possible. Encourage the mother to pass urine

every two hours and test for acetone to exclude acidosis.

Management of Trial of Labour

A vaginal examination should be done every four hours to assess the level of the presenting part, the degree moulding and flexion, the dilation of the cervix (whether progressive or not), the consistency of the cervix and the presence or absence of caput.

You should also check whether the membranes are intact or ruptured. Encourage adequate hydration by giving intravenous 5% dextrose. Sedate the mother with pethidine or morphia in early labour to promote rest, and reduce anxiety.

Undesirable Factors in Trial of Labour

Undesirable occurrences include:

- Rupture of membranes
- Colour of liquor is meconium-stained
- Uterine action is abnormal
- Abnormal presentation, where there is a change from vertex to brow
- When the presenting part fails to descend in spite of good uterine contraction
- When there are signs of foetal or maternal distress

Trial of labour may result in spontaneous vaginal delivery, assisted vaginal delivery by either forceps or vacuum, or caesarean section due to complications.

Trial of Scar: Vaginal Birth After Caesarean Section

Trial of scar is a test of labour for a woman with a previous caesarean section scar, where no recurrent indication is present.

Studies have shown that some 60 – 65% of previous caesarean section mothers (Reedes/Martin, 1987) deliver per vagina, involving same or fewer risks than a repeated section. The trial should be in a facility where, if there is a need for a caesarean section, this can be performed immediately. The midwife should be vigilant in making the necessary observations.

The Main Contraindications to Trial of Scar

The main contraindications include:

- Where the reason for the first scar is likely to be repeated, for example, in cephalopelvic disproportion
- Classical type of caesarean section
- Malpresentation, for example; breech
- Two previous caesarean section scars, regardless of the causes
- Where the previous scar wound did not heal with the first intension
- Where pregnancy occurs within six months of a caesarean section
- Where there is over-distension due to multiple pregnancy or hydromnious
- Multiparty

The management of this mother is as for trial of labour with the addition of these few points below:

- Palpate abdomen gently
- Check for any tenderness over the scar
- Observe for any signs of impending rupture of the uterus
- Report any constant pain in abdomen

Educating the Patient on Avoiding Unnecessary Caesarean Birth

A small percentage of women with conditions that are a threat to the foetal or maternal life need a caesarean section. Many other women have a caesarean section due to a series of events, which leads to an inevitable section seen as necessary at that particular time. For some, if other options had been discussed earlier, a caesarean section may have been avoided.

Some mothers insist on the operation if the month coincides with the previous month of birth of other children, so as to have the same birthdays for their babies. Others prefer not to push and go through the whole process of enlarging the birth canal. If these women were well informed, they might see the sense of preventing a caesarean section. Additional contributing factors to the decision to have a caesarean section include mismanagement of the syntocinon drip, choice of obstetrician and/or hospital policy.

Maternal Distress

This is a serious and life threatening condition, which should not occur in this era. It happens when the metabolism and the electrolyte balance of the woman in labour is disturbed and this can result into ketoacidosis hypotonic uterine inertia. Maternal and foetal distresses usually occur together after prolonged labour.

In maternal distress, the accumulation of ketoacids and the electrolyte imbalance also

affect the metabolism and function of all the other muscles in the body. The intestines stop contracting, which is known as intestinal ileus. The large intestine (colon) distends. Emptying of the stomach is delayed. With large volumes of fluid stagnating uselessly in the stomach, and the small and large bowel, the woman becomes dehydrated. These disturbances in the mother result in a similar disturbance in the foetal metabolism. Often maternal and foetal distress present together in women who have been in labour for a long time at home and are brought to a health centre or hospital in poor condition.
The main symptoms of maternal distress are that the mother is exhausted by severe pain and lack of sleep and she might have severe abdominal pain because of the prolonged and obstructed labour.

- She displays signs of anxiety
- She has a dry and furred tongue
- Her pulse rate is over 120 beats per minute
- Rapid and deep respiration because of acidosis
- She has hot, dry and inelastic skin
- She has a distended abdomen
- There is a reduced output of highly concentrated urine
- Her temperature is 38℃
- She might already have a purulent discharge from an intrauterine infection due to early rupture of the membranes

The main investigation is testing for the presence of acetone in the urine.
The management of Maternal Distress involves giving an infusion of 10% glucose to correct dehydration. A caesarean section is performed when in the first stage of labour. In the second stage, an episiotomy is given and delivery is assisted with vacuum extraction.

Foetal Distress

Foetal distress occurs when the foetus is deprived of oxygen and, as a result, develops hypoxia. The baby may be born as a still birth or develop asphyxia and suffer brain damage.

Causes of Foetal Distress

- Congenital malformation
- Problems with the cord, for example, prolapse, true knot, twisted round the neck
- Obstetric complications
- Mother's condition of preeclampsia/eclampsia
- Severe anaemia, APH

Intra-partum causes include:

- Prolonged labour
- Malpresentation and malposition
- Shoulder dystocia

Foetal tachycardia of more than 160 per minute is an early sign while foetal bradycardia or pulse less than 120 beats per minute is a late sign of foetal distress. Foetal heart acceleration related with uterine contraction is another sign of foetal distress.

Management of Foetal Distress

When foetal distress is anticipated, a blood sample is taken, the normal pH being 7.35. If this falls to 7.2, labour has to be terminated. Below pH 7 the brain cells perish. When there are signs of foetal distress, call the doctor. If the mother is on an oxytocin drip, stop it immediately. Change the mother's position and give oxygen by facemask. If the mother is in the first stage of labour, a caesarean section should be performed.
If she is in the second stage, an episiotomy should be given. Forceps or vacuum hastens the birth. A paediatrician should always be present, if possible.

Post Term Pregnancy

Prolonged pregnancy, or post term pregnancy, refers to a pregnancy that has exceeded 294 days from the first day of the last menstrual period. The difference between this term and post maturity or post mature is that the latter relates to the baby and refers to features or conditions of the neonate.
It has been proven that the duration of pregnancy differs depending on parity and race. Primagravidae have a longer duration of 288 days, compared to multigravidae, who normally have a duration of about 283 days.
To determine prolonged pregnancy is not easy as the mother may give wrong dates. Assessing the gestation period by clinical estimation can be inaccurate because of the biological variation in the size of the mother and the foetus. Quickening cannot be relied on as there is a range of weeks. A primagravida may start feeling quickening between 15-22 weeks while a multigravida may feel quickening at 14-22 weeks. An ultrasound may be relied on in the

assessment of maturity. Early scanning can also help to reduce the mistake of diagnosing prolonged pregnancy.

Risks of Post Term Pregnancy
There is low prenatal mortality at 40 weeks, which increases at 42 weeks. The post term period contributes to foetal maturation, with big babies weighing 4,000gm in 10% of cases and 4,500gm in 1% of cases. This can result in cephalopelvic disproportion or shoulder dystocia. There is a reduction of amniotic fluid, which may result in cord compression and reduction of the placental function. There is also a high risk of foetal distress. The management of post term pregnancy usually involves induction of labour (Myles 1999).

Induction of Labour

Induction of labour involves the initiation of uterine muscle contraction by artificial means.

Remember: Make sure that when labour is induced it will result in a viable baby.

Indications

- When the health or well being of the mother or the foetus would be endangered if the pregnancy continues
- Prolonged pregnancy because after 42 weeks there is danger of placental insufficiency
- Preeclampsia, where both mother and baby are in danger, with the mother in danger of eclampsia and the baby in danger of placental insufficiency
- Signs of intrauterine growth, retardation, which can be detected by abdominal examination or serial ultrasound scan
- Placental insufficiency more common in primigravida aged over 35 years
- Poor obstetric history, for example, history of stillbirth or intra uterine growth retardation in previous pregnancies
- Polyhydramnious, foetal abnormalities
- Spontaneous rupture of membranes. If membranes rupture spontaneously after 36 weeks gestation and labour does not commence within 12 hours, danger of intra uterine infection is very high
- Previous large baby, where weight was over 4kg. Induction is indicated between 38 - 40 weeks. Foetal size tends to increase with successive pregnancies
- Diabetes mellitus, noting that intrauterine death tends to occur near term so induction is indicated between 36 - 38 weeks
- Rhesus iso-immunisation, where rhesus antibodies are present in the maternal serum and the titre is high, labour should be induced to save the life of the baby
- Unstable lie when placenta praevia and pelvic abnormalities have been excluded
- Genital herpes, where labour is usually induced after 38 weeks gestation if disease is in remission
- Previous precipitate labour which tends to recur so induction is indicated at 38 weeks
- Social reasons, which is not common in our community but occurs sometimes
- Intrauterine death

Foetal Maturity and Viability
Where possible amniocentesis may be performed. The lecithin to sphingomyelin ratio in the liquor is calculated in order to estimate the foetal pulmonary maturity. When the ratio is less than two to one, it means that the lungs are not yet mature and induction of labour should be delayed. At times, steroids are given to the mother to stimulate the foetal lungs to produce surfactant to reduce the risk of RDS (Respiratory Distress Syndrome).

Remember:
You must also make sure you have excluded any contraindications for induction of labour.

Contraindications for the Induction of Labour

- Cephalopelvic disproportion
- Unreliable estimated date of delivery. Confirm estimated date of delivery and maturity by ultrasound
- Malpresentation
- Oblique or transverse lie
- Foetal compromise, that is, if the foetus could not stand the uterine contractions due to prematurity or placenta insufficiency. In such cases caesarean section is preferred
- Psychological factors, for example, if the mother is against induction, her decision should be respected

- Placenta previa

Favourable factors for induction include:

- 38 or more weeks of gestation
- Bishop's score of six or more
- Where 3/5ths of the head or less is palpable above the pelvic brim

here are different methods of induction, which are:

- Medical, where drugs alone are used and the amniotic sac remains intact
- Surgical, where the membranes are artificially ruptured
- A combination of medical and surgical intervention

You will now explore each of these methods in more detail.

Medical Induction

Intravaginal prostaglandin E2 are used in the form of pessaries (2.5mg), vaginal tablets (3-6mg) or gel (2.5-5mg). A nelatone urinary catheter is attached to a syringe containing the gel while membranes are intact in case of intrauterine infection. Introduce the gel to the posterior vaginal phornix.

The dose varies from 2.5mg-5mg. If there is no change overnight, prostaglandin may be added/repeated, but if the cervix ripens overnight, then pessaries of prostaglandin E2 may be introduced to the vagina.

The following steps should be taken to ensure adequate care of the mother during the procedure:

- Maximum of an hour is needed to allow absorption of the prostaglandin, so the mother should be asked to stay in for this period
- Observations are carried out as in normal labour
- After one hour, if foetal heart is normal, the mother should be allowed to walk around
- After four hours, if labour has not been established, a vaginal examination should be done to reassess the cervical dilatation
- If there has been some progress, artificial rupture of the membranes is done and a syntocinon drip is commenced two hours later to prevent sensitivity of the uterus

Oral prostaglandin is usually used to induce labour where the membranes have ruptured. One tablet is swallowed at an hourly interval. A maximum of ten tablets should be administered. Each tablet contains 0.5mg of prostaglandin E2. Should it cause diarrhoea, the administration should be stopped immediately.

You should note, however, that there are several complications associated with prostaglandin. The mother may suffer discomfort due to painful contractions. The induction may be ineffective. Over-stimulation of the uterus can cause foetal and maternal distress.

Another variety of medical induction is oxytocin administration. The amount and rate of oxytocin must be carefully calculated and administered. Usually 5% dextrose in water of 500mls with five units of syntocinon is commenced after a vaginal examination. The drip is started at 15 drops per minute and increased by ten drops after every half-hour to a maximum of 60 drops. Using two bottles of the same solution is preferred so that in the event of discontinuation of oxytocin, the intravenous line will still be open.

It is crucial to label the amount of syntocinon put in both the bottle and the 2.5ml IV for multiparous and 5ml IV for primigravida chart.

Factors Which Should be Observed and Recorded During Oxytocin Infusion

- Dosage of oxytocin, the name and amount of solution
- Rate of flow
- Vital signs and foetal heart rate every 15-30 minutes
- Vaginal examination findings four hourly
- Maintain intake and output chart
- Record in the chart any other treatment that is given

Possible Complications of Oxytocin Use

- Hypertonic uterine contraction causing foetal distress
- Tetanic and tumultuous contractions, which can result in abruptio placenta
- Birth injury due to rapid expulsion of the baby
- Mother may develop hypertension with frontal headache

Remember:
If any one of the above signs occurs, stop the syntocinon drip immediately and inform the doctor.

Medical Induction
The Bishop Score is an objective method of assessing whether the cervix is favourable for induction of labour. The table below shows how the score is calculated.

Bishop Score Table

Scores					
Inducibility features		0	1	2	3
1	Consistency of cervix	Firm	Medium	Soft	-
2	Position of cervix	Posterior	Mid	Anterior	-
3	Length of cervix in cm	>2	2	1	<0.5
	(or Effacement)	(0-30%)	(40-50%)	(60-70%)	(80%+)
4	Dilatation of cervix	Closed	1-2cm	3- 4cm	5cm+
5	Station of presenting part 1 cm above or below ischial spines	-3	-2	-1,0	3

Each score is awarded 0 - 3 and the range of scores is 0 - 13. A total score of six or over is favourable. However a score of nine or more will have a safe, successful induction with an estimated length of labour of less than four hours.

Surgical Induction (Amniotomy)
In the case of an uncomplicated pregnancy, a sweep of the membranes is an effective method of inducing labour. After a vaginal examination, the index finger is swept through the cervical os to detach foetal membranes from the deciduas. The action produces prostaglandin.
Amniotomy is an Artificial Rupture of the Membranes (ARM), which is carried out to induce labour when the cervix is favourable. A well fitting presenting part is essential to avoid prolapse of the cord or rupture of the membranes. Allow the descent of the presenting part to the cervical os. This raises the level of prostaglandin which stimulates strong contractions to hasten labour. This method of induction may be combined with oxytocin drip and this is referred to as combined method. This method has likelihood of delivery within 12 hours, requires less analgesia and reduces the risk of Post Partum Haemorrhage (PPH).

Hazards Associated with Artificial Rupture of Membranes (ARM)

- Intrauterine infection due to contaminated instruments
- Cord prolapse
- Early foetal heart deceleration
- Bleeding due to vasa or placenta previa

Remember:
Due to the potential risks of this method, it is now being discouraged in this era of HIV/AIDS.

Prolonged Labour

The term 'prolonged labour' is used when delivery does not take place after 12 hours of established labour (Baird 1952, Myles 1999). Different terms are used for prolonged labour at different times or for different reasons.

Prolonged Latent Stage
The latent phase lasts from the onset of labour to three centimetre dilatation of the cervical os. If this phase takes more than 20 hours in a primigravida and more than 14 hours in a multigravida, it is considered prolonged. In practice diagnosis should be suspected and treatment instituted many hours before this time interval has elapsed.

Primary Dysfunctional Labour
This is when active phase of labour is slow and the cervix dilates at less than one centimetre per hour.

Secondary Arrest
This is when there is slow cervical dilatation in the active phase after normal progress in early labour.
There are numerous causes of prolonged labour at each stage.

Causes of Prolonged First Stage of Labour

- Poor uterine contractions, leading to the cervix dilating slowly or not at all
- Pelvic abnormalities (passage), where contracted pelvis and tumours of the pelvis cause poor progress in labour
- The foetus (passenger) is a large baby, or there is malposition or malpresentation, which prevent the descent of the foetus, for example, occipito-posterior position or shoulder presentation
- Psychological causes, for instance; tension and fear of the unknown tend to prolong labour, most commonly in women who are primigravidae

Casues of Prolonged Second Stage of Labour

- Secondary hypotonic contractions may cause a delay
- Poor maternal effort, which could be due to fear, exhaustion or lack of sensation due to epidural block, which may inhibit the woman's ability to bear down
- A rigid perineum, which may prevent the advance of the foetus. During the perineal phase, an episiotomy should be performed at the height a contraction
- Reduced pelvic outlet, as in the android pelvis, which narrows at the outlet due to its prominent ischial spines and narrowed sub-pubic arch
- A large foetus, malposition or malpresentation, leading to a large presenting diameter, accounting for the delay

Remember: You should reassure the mother at all times during labour.

Diagnosis of Prolonged Labour
Now that you have seen the possible causes of prolonged labour, you will now focus on the diagnosis of prolonged labour. The following methods may be used to diagnose prolonged labour:

- Proper history of labour including type, duration and frequency of uterine contractions
- Examination of the mother, checking for general appearance, whether distressed or exhausted
- Check the temperature and pulse as an increase of either of them would be significant
- Urinalysis, where concentrated urine suggests fluid imbalance and dehydration. Check for ketones in the urine, the presence of this must be corrected at once
- It is important to identify the cause in order to decide the course of action.

Management of prolonged labour involves management as in normal labour but with some additional steps.

Additional Steps Required in the Management of Prolonged Labour

- When progress of labour is delayed due to poor uterine contractions, syntocinon drip must be put up. If there is no progress in spite of good uterine contraction, labour should be terminated by caesarean section
- Assist the mother to adopt a comfortable position
- Start an intravenous infusion to correct dehydration and ketosis, for example, Ringer's lactate solution or 5% dextrose
- Encourage the mother to empty her bladder every two hours and test the urine for ketones to exclude maternal distress
- Maintain a fluid input and output chart
- Allow sips of water if absolutely necessary even in anticipation of general anaesthesia
- Give oral ranitidine (zantac) 15mg every six hours to reduce gastric secretions
- Give broad-spectrum antibiotic if membranes rupture early (within 24 hours)
- Observe and record every two to four hours temperature, pulse, respiration and blood pressure

- Contractions should be recorded every 15 to 30 minutes and take care of the bladder every two hours

Foetal Condition in Prolonged Labour
The following steps should be taken to monitor the foetal condition:

- Monitor the foetal heart continuously every quarter to half hour.
- Observe the amniotic fluid for presence of meconium to rule out foetal distress.
- For secondary hypotonic uterine contraction, commence an intravenous infusion of syntocinon with 10% dextrose to stimulate adequate contractions
- Ensure that the presenting part is visible before encouraging the mother to push.
- Perform an episiotomy under local anaesthesia or at the height of a contraction if the perineum is rigid.
- If the cause was obstruction at the outlet as in android pelvis, and the head is arrested mid pelvis resulting to foetal distress, caesarean section is recommended.

Complications of Prolonged Labour
There are a number of complications, which may be experienced by both the mother and the foetus during a prolonged labour.

Maternal complications

- Oedema of the pelvic floor due to the pressure of the presenting part on the pelvic floor and the vaginal walls
- Retention of urine due to continuous compression of the urethra by the presenting part causing bruising which might persist during puerperium
- Ruptured uterus due to overstretching of the lower uterine segment
- Deep perineal tears due to overstretching of the perineum, leading to cystocele or rectocele
- The overstretching of the pelvic floor and uterine ligaments may also cause uterine prolapse
- Stress incontinence

Foetal complications

- Intra cranial damage due to excessive moulding
- Foetal hypoxia, which will lead to asphyxia
- Intra cranial haemorrhage due to prolonged compression of the head, and difficult
  instrumental delivery

Prevention of Prolonged Labour
Good prenatal care is essential to prevent prolonged labour.
This includes:

- Taking a proper history in relation to cases of previous difficult deliveries
- Detection of malpresentation and malposition
- Any sign of contracted pelvis should be referred to the obstetrician in time to make a timely decision on the mode of delivery

During labour you should take the following steps:

- Maintain proper partograph of the mother in labour and take early decision
- Ensure proper control of the syntocinon drip
- Ensure bladder is emptied every two hours to avoid delay of labour

Obstructed Labour

Labour is obstructed when there is no advance of the presenting part in spite of strong uterine contractions further progress is impossible without assistance. Usually the power (contractions) involves the passage (the birth canal) and the passenger (the foetus). Obstruction usually occurs at the pelvic brim, but may occur at the outlet, for example, in an android pelvis.
Compare the causes of obstructed labour with those of prolonged labour. In obstructed labour, the problem is the passenger and passage (never the power). Usually this is when the passenger has gross abnormalities. This is the opposite of prolonged labour where the 'power' may be the main issue and the passenger or passage have mild or moderate problem.

The Main Causes of Obstructed Labour

- Cephalopelvic disproportion

- Malpresentation, for example; shoulder, brow presentation or persistent mentoposterior position
- Fibroids or tumours located in the lower uterine segment
- Cervical dystocia
- Gross foetal abnormalities e.g. hydrocephalus, locked twins
- Disordered uterine action

Diagnosis of Obstruction of Labour
Early Signs

- The presenting part does not enter the pelvic brim despite good uterine contraction
- The cervix dilates slowly and hangs loosely like an empty sleeve due to poor application of the presenting part
- The membranes tend to rupture early

Later Signs

- Foetal and maternal distress, which occur concurrently
- The contractions are hypertonic and the mother does not relax in between them
- The uterus is moulded around the foetus
- The mother may have pyrexia and tachycardia
- On vaginal examination, there is presence of large caput
- The vagina feels hot and dry and the cervix and vulva are oedematous
- In cephalic presentation, the presenting part becomes wedged and immovable when it descends partly into the pelvis
- It is difficult to pass urine, if catheterised, the urine is bloodstained due to the bruised urethra
- Urinary output is poor
- Uterine exhaustion occurs and contractions cease for a while, only to recommence with renewed vigour, especially in primigravida
- A Bandle's ring is seen abdominally as the lower segment is progressively enlarged and thinned out and the upper segment becomes shorter and thick

Prevention of Obstruction of Labour
Obstructed labour can be prevented through the following measures:

- Good prenatal care to detect mothers at risk
- Clinical and radiological investigations of pelvis adequacy if necessary during the prenatal period
- Careful assessment of the progress throughout labour to detect lack of descent before labour is obstructed
- Taking and interpreting vital observations during labour. This includes foetal heart rate, maternal pulse, temperature and blood pressure, assessment of length, strength and duration of uterine contractions, cervical dilatation four hourly
- Alert an obstetrician immediately, If obstructed labour is suspected
- Commence an intravenous infusion if not already commenced
- Take blood for grouping and cross match in case transfusion is needed. (Keep ready two units of blood) catheterise to empty the urinary bladder
- Maintain asepsis techniques to prevent infection
- In case of early rupture of membranes, give prophylactic antibiotic (as ordered by the doctor)
- Give pre-medication as per doctor's order (Pethidine 100mg IM stat)
- Prepare the mother for emergency caesarean section if in the first stage of labour

In the second stage of labour, failure to progress may be caused by deep transverse arrest. If obstruction cannot be overcome by rotation and assisted birth, a caesarean section should be performed as soon as possible.
The newborn unit should be informed to prepare to receive an asphyxiated baby. Resuscitation equipment should be kept ready and a paediatrician should be present at birth. The surgeon will check carefully for any indication that the uterus has ruptured before taking the patient to theatre for repair of the uterus.
If the labour is obstructed and the foetus has died, the mode of delivery will still be caesarean section, as vaginal birth cannot be achieved.
The following advice should be given to mothers on the prevention of obstructed labour:

- Mothers should attend antenatal clinic as soon as they realise they are pregnant

- All mothers who have had a previous caesarean section should have a hospital delivery
- Discourage home deliveries, especially of primigravidae and grand multiparous
- Educate traditional birth attendants on early signs of obstructed labour
- Provide health education to the community on the risks of too early or too late pregnancies
- Advise pregnant mothers on the importance of a well balanced diet

Complications Occurring in Obstruction of Labour

There are a number of complications, which may be experienced by both the mother and the foetus during obstructed labour.

Maternal complications

- Rupture of the uterus, due to excessive thinning of the lower uterine segment
- The bladder is traumatised by pressure of the foetal head during labour and delivery. When the bladder or rectum is bruised, this may cause vesico-vaginal fistula or recto-vaginal fistula
- Injury due to a difficult instrumental delivery
- Urinary incontinence due to prolonged compression of tissues causing necrosis of the bladder
- Prolonged rupture of membranes may cause intra uterine infection
- Maternal death occurs when operative delivery is carried out before shock and dehydration is corrected
- Death can also occur in ruptured uterus due to haemorrhage. You will discuss this in greater detail in the section on Obstetric Emergencies.

Foetal complications

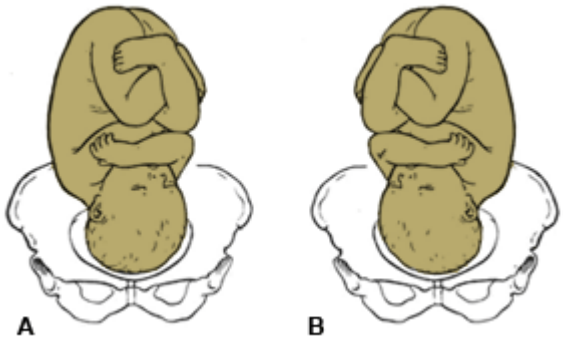
- Intrauterine asphyxia, leading to intracranial damage, that is, permanent brain damage or stillbirth
- Intracranial haemorrhage
- Neonatal pneumonia due to ascending infection resulting from meconium aspiration
- Neonatal death

Malposition of Occiput and Malpresentation

The foetus is not always in the desired position or lie in the uterus. As a result of malposition there is malpresentation of the foetus. The midwife needs to be aware of the various possible malpresentations their complications and how to manage the situation. Several malpositions of the occiput and malpresentations in general are discussed in the following pages.

Occipito Posterior Position

Occipito posterior position is a malposition of the occiput. In this position, the vertex is present but it occupies the posterior position instead of the anterior. The occipito posterior position can be either left or right. The cause is not clear but it is associated with abnormalities of the pelvis.



Right (A) and left (B) occipito posterior position.

Diagnosis of Occipito Posterior Position

On inspection of the abdomen you will notice a saucer shaped depression at or below the umbilicus. The unengaged head will outline the bladder as if it is a full bladder.

On palpation the head is high, as the engaged diameter of 11.5cm cannot enter the brim until flexion takes place. The head feels large and the occiput and sinciput are on the same level. The back is difficult to palpate. Limbs are felt on both sides of the abdomen.

On auscultation the foetal heart is heard on the right flank. It could also be heard at the umbilicus, either at the middle line or slightly to the left.

During labour the mother may complain of severe backache. You may note a slow descent of the presenting part in spite of good

contractions. Early rupture of membrane may occur.
On vaginal examination the diagnosis can be confirmed on feeling the anterior fontanelle to the left anterior in ROP. The Sagittal sutures will be in the right oblique of the pelvis, but the findings will depend on the degree of flexion of the head.

Management of Labour in the Occipito Posterior Position
In the occipito posterior position you should expect prolonged, painful labour due to poor fitting of the presenting part, which does not stimulate good contractions.

First Stage of Labour
The mother may experience severe backache. You should give a back massage and encourage the mother to remain mobile as long as she can and to adopt what ever position that is most comfortable to her. Most women find the all-fours position most comfortable, pain relieving and is also believed to aid in the rotation of the foetal head. Labour is prolonged with incoordinate uterine action. Give intravenous fluid to ensure that the mother is not dehydrated.
Uterine action should be regulated by the use of syntocinon. Keep accurate records by plotting half-hourly observations of the foetal heart, contractions every four hours, and blood pressure in the partograph. Maintain a strict intake and output chart. The mother may have the urge of early pushing due to the occiput pressing on the rectum. You should discourage her from pushing at this stage as this will cause the cervix to be oedematous and delay the onset of the second stage. Encourage her to change her position and use breathing techniques, as these will control the urge of early pushing.

Second Stage of Labour
The second stage should be confirmed by vaginal examination as the caput may be seen at the vulva with the anterior lip of the cervix. During labour, one of the following may occur:

- Long internal rotation
- Short internal rotation
- Deep transverse arrest

The second stage of labour can present any of three conditions which you will now explore in detail.

Long Internal Rotation
This is where the head turns 3/8 of a circle in 90% of cases and the baby is born as in occiput anterior.

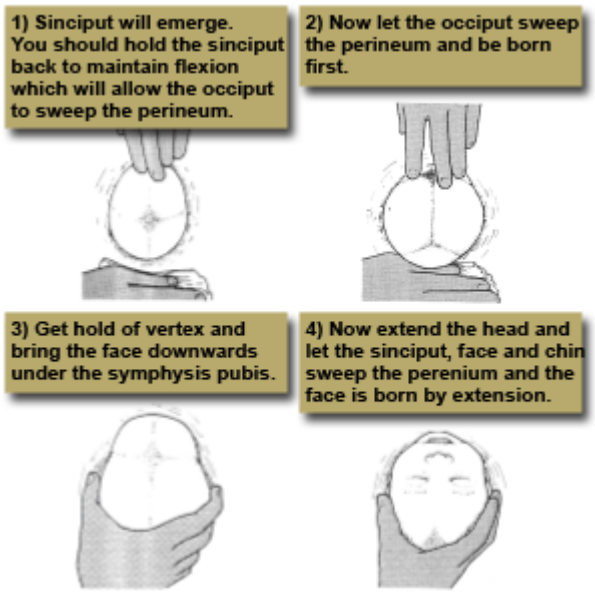
Characteristics of Long Internal Rotation

- The lie is longitudinal
- The attitude is one of deflexion
- The presentation is vertex
- The presenting part is the middle or anterior area of the left pariental bone
- The position is right occipito posterior
- The denominator is the occiput
- The occipito frontal diameter 11.5cm lies in the right oblique diameter of the pelvic brim
- The occiput points at the right sacroiliac joints and the sinciput points at the left iliopectineal eminence
- There is increased flexion and descent takes place in the occiput head and reaches the pelvic floor
- Internal rotation of the head occurs which rotates 3/8 of a circle on the right side of the pelvis while the shoulder rotates 2/8 of a circle on the same side
- The head crowns
- The sinciput, face and chin sweep the perineum, the head is born by extension
- Restitution where the occiput turns 1/8 to the right, undoes the twist at the neck and rights itself with the shoulder
- Internal rotation of the shoulders. The shoulder enters in the same oblique diameter of the pelvis. Anterior shoulder reaches the pelvic floor and rotates 1/8 of a circle forward and lies under the symphysis pubis
- External rotation of the head accompanies the internal rotation of the shoulder
- Anterior shoulder escapes under the symphysis pubis, while the posterior shoulder sweeps the perineum
- The body is born by movement of lateral flexion

Remember: The above movements do not differ much from the normal mechanism as you may have noticed.

Short Rotation
In cases of short rotation or persistent occiput posterior position, the occiput fails to rotate forward. It persists with the same position. The sinciput reaches the pelvic floor and rotates forwards, while the occiput sinks in the hollow of the sacrum.
The baby is born face to pubis.

Management of Face to Pubis Delivery
Give an episiotomy when necessary:
You should watch for signs of buttonhole tear due to the large presenting diameter. A buttonhole tear is a rupture at the centre of the perineum.
If you failed to diagnose this earlier you may be extending the head thinking it is a vertex delivery, until you see the hairless forehead escaping under the pubis arch. You should then flex the head towards the symphysis pubis.



Deep Transverse Arrest
This is where the occiput fails to rotate forward. This forces the sinciput to reach the pelvic floor first and rotate forwards. The occiput then goes into the hollow of the sacrum, which results in the face to pubis delivery. At first there is good flexion. The occipit reaches the pelvic floor and begins to rotate but flexion is not maintained. The occipito frontal diameter is caught by the bispinious diameter of the outlet. This arrest may be due to poor contractions, a straight sacrum or prominent ischial spines.
On vaginal examination the sagittal suture is on the transverse diameter of the pelvis and both anterior and posterior fontanels are palpable. The head is caught at the ischial spines.

Management of Deep Transverse Arrest
Reassure the mother while explaining the position of her labour. Take her consent for the operative procedures which will be necessary. Inform the doctor of her situation. Encourage her to breathe slowly and change her position to discourage pushing. When the doctor arrives, administer analgesics. A vacuum extraction may be performed or the head may be rotated with forceps and the baby delivered.
Aftercare is the same as in operative manipulation.

Conversion to Face or Brow
At the onset of labour with a deflexed head, an extension may occur instead of flexion. When there is complete extension, the baby will be born as face presentation but when there is incomplete extension (this is refered to as 'military attitude'), the presenting part turns to brow. A delivery by caesarean section is recommended.
You have seen that labour is not smooth with this type of malposition.

Complications of Conversion to Face or Brow
- Obstructed labour, as a result of deflexed or partially extended head that is impacted in the pelvis
- Maternal trauma, as a result of prolonged labour, or instrumental delivery causing perineum tears. In undiagnosed OPP, instrumental delivery may cause third degree tears
- Neonatal trauma to the baby, if forceps or ventous vacuum extraction are used
- Cord prolapse which may cause hypoxia, that may result in stillbirth
- Cerebral haemorrhage, due to the compression of a large presenting part
- Asphyxia, leading to brain damage

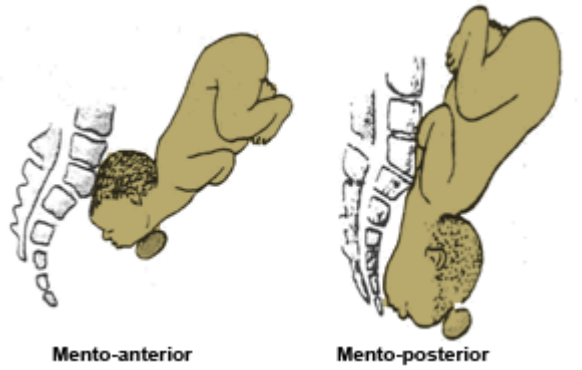
You will now look at face presentation as it is one of the potential OPP outcomes. Note the delivery of face in comparison with face to pubis.

Face Presentation

Face presentation occurs when the head has complete extension, and the occiput is in contact with its spine. It happens in about one in every five hundred labours. Primary face presentation is when the face presents before labour. The term secondary face presentation is used when the face presents during labour. There are six positions in a face presentation, namely:

- Right mento-posterior
- Left mento-posterior
- Right mento-lateral
- Left mento-lateral
- Right mento-anterior
- Left mento-anterior

The denominator is the mento, the presenting diameters are the submento bregmatic (9.5cm) and the bi-temporal (8.2cm).



Mento-anterior Mento-posterior

Causes of Face Presentation

You will now look at some of the causes of face presentation in detail.

Anterior Obliquity of the Uterus

The pendulous abdomen of a multiparous woman leans forward resulting in the alteration of the direction of the uterine axis. This causes the foetal buttocks to also lean forward and the force of the contractions to be directed in a line towards the chin, rather than occiput, which usually results in extension of the head.

Contracted Pelvis

Face presentation develops as the head enters in the transverse diameter of the brim. The obstetric conjugate is bound to be withheld which will result in the extended head in an android pelvis. Face presentation results when vertex presentation is in the posterior position and remains deflexed. The parietal eminences are caught in the reduced sacro-cotyloid dimension, the occiput does not descend and the head becomes extended.

Polyhydramnios

In polyhydramnios, when the spontaneous rupture of membranes occurs, the resulting rush of fluids may cause the head to extend as it sinks into the lower uterine segment.

Congenital Abnormality

The absence of vertex in the encephally thrusts the face forwards. A tumour on the foetal neck can also cause extension of the head although this is rare.

Abdominal and Per Vaginal Diagnosis of a Face Presentation

The diagnosis is usually made in labour. During an abdominal examination check for the following features:

- The shape of the foetal spine is an s-shape.
- The round occiput is prominent and may be ballottable when the position is mento-posterior and a deep groove can be felt between it and the back.

The diagnosis is not always easy and clear. During a vaginal examination you may notice that you can diagnose face presentation with confidence if you have mastered vaginal examination skills. You will differentiate face from brow presentation when you feel the orbital ridges, the brow itself and the anterior sutures. You should look for the following characteristics:

- The presenting part is usually high, soft and irregular
- In a sufficiently dilated cervix you may feel orbital ridges, eyes, nose and mouth
- The mouth may be open with hard gums
- The foetus may suck the examining finger
- In progressive labour, the face becomes oedematous and is difficult to distinguish it from a breech presentation
- To determine the mentum, you must locate it, and if it is posterior, you should decide whether it is lower than the sinciput in order to rotate forward and advance
- The orbit ridges determine the position either on the left or right oblique of the pelvis brim

Mechanism of Left Mento-Anterior Position
In face presentation, you will be substituting occiput with the chin. Instead of flexion you will maintain deflexion and instead of extension you will maintain flexion. Now look at the secret formula:

- Lie is longitudinal
- Attitude is one of extension of the head and the back
- The presentation is face
- The position is left mento anterior. In a left mento anterior position the orbital ridges will be in the left oblique diameter of the pelvis
- The denominator is the mentum
- The presenting part is the left molar bone

Extension
Descent takes place throughout and with increasing extension and thus the mentum becomes the leading part

Internal Rotation of the Head
This occurs when the chin reaches the pelvis floor and rotates forwards 1/8 of a circle. The chin escapes under the symphysis pubis. When this takes place and the sinciput, vertex and occiput sweep the perineum, the head is born.

Restitution
This occurs when the chin turns 1/8 of a circle to the mother's left.

Internal Rotation of Shoulders
The shoulders enter the pelvis in the left oblique diameter and the anterior shoulder reaches the pelvis floor first and rotates forward 1/8 of a circle along the right side of the pelvis.

External Rotation of the Head
This occurs simultaneously and the chin moves a further 1/8 of a circle to the left.

Lateral Flexion
The anterior shoulder escapes under the symphysis pubis, the posterior shoulder sweeps the perineum and the body is born by a movement of lateral flexion.

Prolonged Labour
Labour is often prolonged due to ineffective uterine contraction caused by an ill-fitting presenting part. The facial bones do not mould and in order to enable the mentum reach the pelvic floor and rotate forwards, the shoulders must enter the pelvic cavity at the same time as the head.
With good uterine contractions, descent and rotation of the head occurs and labour progresses through to a spontaneous delivery.

Mento-Posterior Position
When the head is completely extended with an effective contraction, the mentum reaches the pelvic floor first and will rotate forwards an the position becomes anterior.

Persistent Mento-Posterior Position
The head is incompletely extended, the sinciput reaches the pelvic floor first and rotates forwards 1/8 of a circle, which brings the chin into the hollow of the sacrum. Further mechanism is prohibited, which results in impacted face. In order for further descent, both head and chest have to be accommodated in the pelvis.

Management of Labour in Face Presentation
Upon diagnosing the condition the first action you must take is to inform the doctor about the face presentation. Routine maternal and foetal condition observations are done as in normal labour (maternal pulse, foetal heart rate and contraction) half hourly. Blood pressure and temperature is done two hourly. Empty the urinary bladder every two hours.
Vaginal examination to determine cervical dilation and descent of the head, is done every four hours to monitor progress of labour. Take care not to injure the foetal eyes. In mento-posterior positions, the midwife should note whether the mentum is lower than the sinciput since rotation and descent depends on this. If the head remains high despite good uterine contractions, the mother is prepared for caesarean section.

Management of Labour in Face Presentation
Face extends to the Perineum
When the face extends to the perineum, give episiotomy to prevent extensive perineum tear.

Face appears at the Vulva
When the face appears at the vulva, maintain extension by holding back the sinciput until the chin is delivered.

The baby's face appears at the vulva

Chin has been delivered

Once the chin has been delivered allow the occiput to sweep the perineum. In this way the submento-vertical diameter (11.5cm) distends the vaginal orifice, instead of the mento vertical diameter (13.5cm).

The baby's chin has been delivered

Occiput rides over Perineum

The occiput is allowed to ride over the perineum

Head is flexed completely

The head is flexed completely and it is delivered. Inform the doctor if the head does not descend in the second stage. In a mento-anterior position, it may be possible to deliver the baby using forceps.

If the head becomes impacted, or there is any suspicion of disproportion, a caesarean section will be necessary.

The head delivered

There are several possible complications during labour with a face presentation.

Obstructed Labour

A minor degree of contracted pelvis may result in obstructed labour as facial bones do not mould. Caesarean section is necessary in persistent mento posterior position.

Cord Prolapse

A prolapsed cord is more common when the membranes rupture because the face is an ill-fitting presenting part. Always perform a vaginal examination following rupture of membranes to rule out cord prolapse.

Facial Bruising

The baby's head is elongated with a swollen bruised
face, oedematous eyelids and lips at birth. You should take great care while performing vaginal examination to avoid injury.

Cerebral Haemorrhage

The lack of moulding of facial bones can lead to intra-cranial haemorrhage caused by excessive compression
of the foetal skull or by upward compression in the
typical moulding of the foetal skull found in this type
of presentation.

Maternal Trauma
Extensive perineal laceration may occur at delivery due to the large submento vertical and bi-parental diameters distending the vagina and perineum. This increases the incidence of caesarean section, which can increase chances of maternal morbidity and mortality.

Breech Presentation

Breech presentation occurs in about three percent of labour (Campbell & Lees, 2000). Due to the high risks to both the mother and the baby, the present practice is to book all mothers with breech presentation for caesarean section.
In breech presentation, the foetus lies with the buttocks in the lower pole of the uterus, after 34 weeks of pregnancy. There is no obvious reason as to why the foetus presents as breech at term but the following points are contributing factors:

- Maternal causes include contracted pelvis, polyhydramnios and multiple pregnancy
- Foetal causes include pre-term labour, hydrocephalus, extended legs

Breech presentations are classified as follows:

- Complete breech; the buttocks presents with the feet and legs flexed on the thighs and the thighs flexed on the abdomen.
- Frank breech; the buttocks present with the hips flexed and the legs extended against the abdomen and chest; this is the most common type of breech presentation.
- Incomplete breech; one or both feet or the knees extend below the buttocks. This is also known as single or double footling presentation.
- Compound breech; the buttocks present with another part such as a hand. This type of presentation is rare.

The condition can be diagnosed in the following manner:

- Previous history of breech, though this is not conclusive
- On palpation at the fundus, a round, hard, ballotable mass is palpated
- On auscultation, the foetal heart is heard above the level of the umbilicus

Pre-Natal Management of Breech Presentation
The midwife refers the mother to a doctor at thirty two weeks if the breech presentation persists. An x-ray may be done should there be any doubts in diagnosis. It may reveal the following:

- Shape and size of the pelvis
- Size of foetus
- Foetal abnormalities, for example; hydrocephally
- Whether the legs are extended or flexed

High risk conditions for breech pregnancies include:

- Multiple pregnancy
- Previous scar
- Rhesus –ve mother
- High blood pressure

Breech labour may be as easy as normal labour. You will now look at the dangers of breech delivery and how you may prevent them.
Prenatal mortality rate is 10%, while 50% of stillbirths in breech presentation are pre-term. The danger is great, except in the hands of experts. When nearing the second stage of delivery you should:

- Prepare the equipment for delivery
- Prepare resuscitation trolley and drugs in case of an asphyxiated baby
- Inform the obstetrician and paediatrician

Risks to the skull
The soft skull bones are damaged easily. A large skull may be trapped by the partially dilated cervix, which had allowed the other part of the baby to pass through. It is important to make sure the patient does not push prematurely. Use of sedatives can help to keep the mother calm.

Intracranial haemorrhage
This may occur due to rapid compression of the unmoulded skull. Venous congestion, which is caused by hypoxia, might occur. It may also result
from the upward force of foetal blood into the intracranial venous sinuses,the sudden release of the head from the cervix and/or the quick extraction process.
This is why it is important to inform the mother as soon as the condition is diagnosed that there may come a time when she will feel that the head is pushing out and she has the urge of

pushing but she should plan to release the head slowly to prevent damage to the baby's head.

Hypoxia
This is caused by interference with the utero-placental circulation. You should not use fundal pressure if there is placental separation while the head is still in the vagina.

Cord compression
This is inevitable with a big baby, but you can assist by pulling a loop of cord after the baby is born up to the umbilical and try to position it so that it is not nipped. When the cord is compressed, the foetus will be stimulated to prematurely breathe and inhale mucous or liquor which will cause asphyxia at birth and subsequent pneumonia.

Injuries
It is very easy for the baby to sustain fractures of the lower and upper limbs but you can prevent this by being competent in the delivery of extended legs. You can flex the knee and gradually pull it out. You may also use Lovset's manoeuvre and should know how to splint the upper arm and flex the elbow.
Prevent rupture of the liver and spleen by holding the baby at the iliac crest with the thumbs at the sacrum. Avoid holding the baby at the kidney level to prevent damage to adrenals. Paralysis can occur due to crushing of the spinal cord. To prevent crushing the spinal cord you, should always check that the sub occipital area appears before you carry an upward traction.

Mechanism of Labour in a Left Sacro Anterior (LSA) Position
The bitrochanteric diameter (10cm) enters in the left oblique diameter of the pelvic brim. The sacrum points to the left ilio-pectineal eminence.

Summary of LSA Position	
Position	Left – Left Sacro-Anterior, LSA
Lie	Longitudinal
Attitude	Complete flexion
Presentation	Breech
Denominator	Sacrum
Presenting part	Anterior buttock

Descent
This takes place with increasing compaction due to increased flexion of limbs.

Internal Rotation of the Buttocks
The anterior buttock reaches the pelvic floor first and rotates one eighth of a circle forwards along the right side of pelvis. The bitrochanteric diameter is now in the antero-posterior diameter of the outlet.

Lateral Flexion of the Body
The anterior buttock escapes under the symphysis pubis. The posterior buttock sweeps the perineum and the buttocks are born by a movement of lateral flexion.

Restitution of the Buttock
The anterior buttock turns slightly to the patient's right side.

Internal Rotation of the Shoulders
The shoulders enter in the same oblique diameter of the brim as the buttocks. The anterior shoulder rotates forwards one eighth of a circle along the right side of the pelvis and escapes under the symphysis pubis. The posterior shoulder sweeps the perineum and the shoulders are born.

Internal Rotation of the Head
The head enters in the transverse diameter of the pelvic brim. The occiput rotates along the left or right side of the pelvis. The sub-occipital region (nape of the neck) impinges under surface of the symphysis pubis.

External Rotation of the Body
The body turns so that the back is uppermost, a movement which accompanies internal rotation of the head.

Birth of the Head
The chin, face and sinciput sweep the perineum and the head is born in flexed attitude.

Second Stage of Labour
At this stage you should reassure the mother and confirm fully dilation of the cervix by performing vaginal examination.
Note:
You should not be overly concerned by seeing the buttocks at the vulva as they are soft and can pass through a 6cm dilated os.
Delivery of Complete Breech

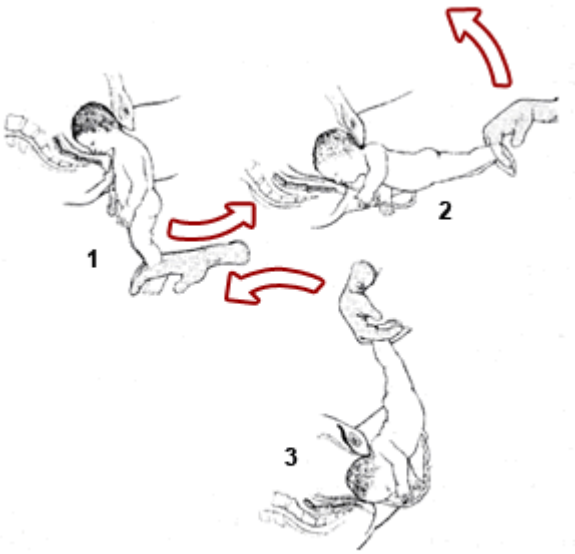
The following procedure should be followed when delivering the complete breech:

- Mother's buttocks are positioned at the edge of the bed to allow the baby to hang and apply supra-pubic pressure to the head if required
- Give episiotomy when the buttocks extend the perineum, to avoid compression of a moulded head
- The buttocks should be expelled by an aided bearing down effort of the mother
- With the same contraction the baby is born up to the umbilicus
- Pull a loop of cord to prevent traction of the cord. The cord should be handled gently to avoid inducing spasm and should be nipped under the pubic arch to avoid anoxia
- Check if elbows are on the chest as is the case with complete breech
- The midwife can assist the expulsion of the shoulder by wrapping a small towel around the baby's hips as it is slippery and loses heat
- Hold the baby by the iliac crest to avoid crushing of liver and spleen

The key point to remember is: 'Hands off the breech! Let nature take its course!'

The procedure continues:

- While the uterus is contracting and the woman pushing, the anterior shoulder escapes under the symphysis pubis
- Elevate the buttocks to allow the posterior
  shoulder to sweep the perineum
- The back should be in the uppermost position
  until the shoulders are born
- As soon as the shoulders are born, let the
  baby hang by its weight for one or two minutes
- When the hairline appears, grasp the baby
  by the feet and hold the stretch, applying
  sufficient traction to prevent fracture of the neck
- Move the feet through an arch of 180° until
  the mouth and nose are free at the vulva
- You are now holding the baby upside down and mechanical suction can be used to clear the airway to avoid asphyxia
- At this stage, ask the mother to pant through an open mouth, 'breathing out the head'. One or two minutes should elapse to allow slow delivery of the vault of the head to prevent a tentorial tear



Delivery of the head
(The Burns Marshall method)

The previous pages describe a routine complete breech delivery where the apgar score is usually about seven to eight. The breech delivery, however, may not always be this simple. This is supposed to be a doctor's procedure but many times you may have to perform it and perform it efficiently. Should you be called upon to assist in the management of extended legs, you should follow this procedure:

- Apply downward traction until popliteal fossae appear
  at the vulva
- An episiotomy is made when the buttocks extend
  the perineum
- Pressure is applied at the popliteal fossae with abduction
  of the thigh
- The knee will flex and this will aid extraction of the feet and avoid fractures of lower limbs

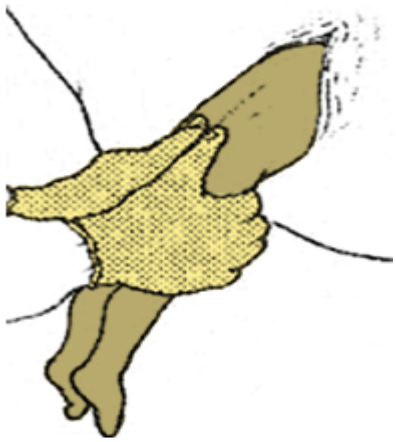
- The foot will be swept over the baby's abdomen and the feet are born
- You should now wait until the baby is delivered up to the umbilicus, pull a loop of cord
- Feel for the elbow at the chest, which should not be felt with extended hands

Management of the extended legs

In a situation where you are called upon to aid with the delivery of the extended hands, you should apply the Lovset manoeuvre. This is a combination of rotation and downward traction to deliver the arms whatever position they are in. The direction of rotation must always bring the back uppermost. When the baby's umbilicus is born and shoulders are in antero-posterior diameter, grasp the baby by the iliac crest applying downward traction until the axilla is visible. Rotate the baby through half a circle 180° anticlockwise. One arm which is now anterior is delivered. Rotate the baby back 180° clockwise and the second shoulder is delivered in a similar manner. Please refer to Myles, Margaret Text book of Midwives for a complete demonstration of this process.

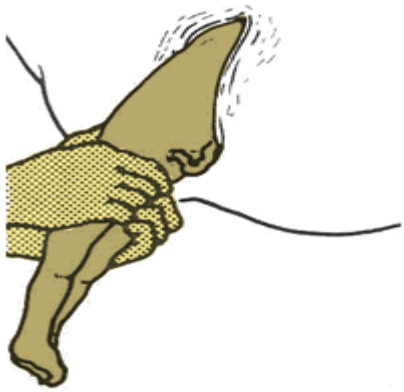
Take hold of the baby

The position of the baby is Left Sacro-Anterior. During a contraction when the umbilicus is born and the shoulders are in the anteroposterior diameter, grasp the baby at the illiac crest with the thumbs over the sacrum. A small towel should be wrapped around the baby's waist to prevent it from being slippery.



Rotate the baby

Rotate the baby through half a circle, 180° anti-clockwise, (starting by turning the back upper most) while applying downwards traction until the axillar is visible. The hand that was posterior now becomes anterior, this movement sweeps the arm infront of the face and also allows the shoulders to enter the pelvis in the transverse diameter.

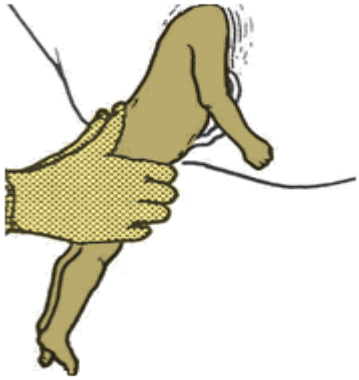


Deliver the anterior arm

The arm that was previously posterior is now anterior. With the two first fingers of your left hand (which is at the baby's back) splint the baby's humerous to avoid breaking it.

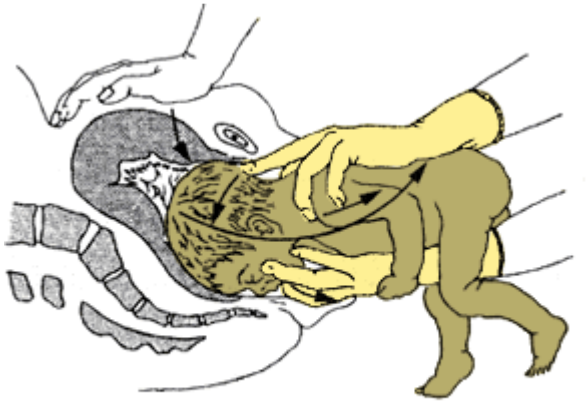
The elbow is drawn downwards and delivered under the pubic arch. Wait for the next contraction.

Rotate the baby again
Rotating the body half circle clockwise, make anterior arm posterior. Using the right hand, splint the humerous, draw it downwards and deliver it under the pubic arch.
Repeat the next side and deliver the other hand.



It sounds easy, but you will agree that at times applying tractions can be a very arduous task. Now look at the diagram of how you will position your hands and fingers when performing the Mauriceau-Smellie-Veit Manoeuvre (jaw flexion and shoulder traction).
The following procedure should be followed when delivering the extended head:

- Position hands and fingers to extract extended head
- Put the baby astride your left arm with the palm supporting the chest
- First and third finger of left hand should be placed on the malar bones to flex the head, middle finger in the mouth well back
  to aid flexion
- First and second right hand fingers should be hooked over the shoulders pulling moderately in a downwards direction



Delivery of the extended head (Mauriceau-Smellie-Veit Manoeuvre)

The procedure continues:

- Controlled traction is exerted in a downwards direction as the head descends in the curved birth canal. Traction continues until the sub occiput area appears before the appearance of the nape of the neck. Upward traction at this level will inflict fracture of the neck
- Instruct the mother to pant
- Exert traction in upward direction to allow for the birth of the head. Nose and mouth are free. Your intervention will clear the airway
- The Vault is delivered slowly

Causes of Delayed Breech
The following are some of the causes of delayed breech:

- Delay in the first stage is rare, though it may be caused by impaction due to a large baby, a small pelvis or weak contractions in which case a caesarean section is done
- Delay during the second stage is usually caused by extended legs

In terms of management, nothing should be done until the buttocks extend the perineum. At this point you should perform a medio-lateral episiotomy.

Delay in the Birth of the Head
If an insufficiently dilated cervix holds up the head, the baby will make gasping movements. You should mop the vaginal wall in contact with the baby's face and inserting two fingers make a channel through which you can meet the baby.
If the head is arrested high in the cavity, disproportion may exist. Suprapubic pressure may help, but application of forceps is necessary.
The doctor will use forceps for the delivery of the coming head.

SECTION 4: ABNORMAL PUERPERIUM

Introduction

You are now going to look at abnormal purperium. First you need to reflect on the meaning of the puerperium or postpartum period.
The puerperium or postpartum period starts about one hour after delivery and continues for the next six weeks. During the postpartum period, the mother goes through physical and psychological transition caused by what she has gone through her pregnancy with all the adjustments of hormones, not to mention the stress and fatigue of labour. Her body is vulnerable to many complications due to blood loss, laceration and injury of the birth canal.
Complications during this period are associated with trauma sustained during childbirth, disorders of the circulatory system or psychological disorders. Postpartum nursing starts from early pregnancy. At that time it is important to prevent the occurrence of complications by treating all infections and controlling chronic diseases from getting worse. Give health education to maintain cleanliness and physical status by encouraging balanced diet to prevent anaemia. During labour, aseptic techniques and vigilant observation should be used to enable early detections of complications that are likely to arise. This will allow you to take appropriate action in good time. During the postpartum period, provide appropriate care and counselling to prevent anxiety, and ensure that the new mother has enough rest and sleep. Try keeping the stressed mother calm. Observe her closely to detect any early signs of complications and treat them promptly.

Objectives

By the end of this section you will be able to:

- Define puerperal pyrexia
- Describe the management of puerperal pyrexia
- Define various breast conditions
- Explain the management of breast complications during puerperium

Puerperal Pyrexia

Puerperal pyrexia is a febrile condition, which presents with a temperature of 38℃ and above within 14 - 21 days following childbirth or abortion.
Causes of puerperal pyrexia include:

- Genital tract infection
- Urinary tract infection
- Breast disorders, for example, mastitis, breast engorgement or breast abscess
- Thrombophlebitis
- Respiratory tract infection
- Other causes of pyrexia such as malaria
- Vesico-vaginal fistula
- Recto-vaginal fistula
- Pyrexia of unknown origin

After separation of the placenta, a superficial wound is left on the uterine wall. Other wounds may be present on the birth canal, depending on the type of delivery. These wounds may be minor bruises or deep tears of the cervix, vagina or perineum. If not appropriately managed, puerperal pyrexia ensues.

Bacteriology
Bacterial organisms are classified in two groups: Endogenous and Exogenous.

Endogenous Organisms
These are harmless organisms, which are present in the lower intestinal tract, on the perineum and in the vagina. They have a role to play in the ecology of the body. Escherichia coli inhabit the bowel and the vagina. Streptococcus faecalis reside in the lower intestine and the anus. Anaerobic streptococci and Clostridium welchii are found in the vagina.

Exogenous Organisms
These are imported into the birth canal from other sources such as the hands of birth attendants or airborne infections from other patients or visitors. The organisms are harboured in dust and in the throat.

Staphylococcus aureus is the main cause of breast infection found in dust and has developed resistance to antibiotics in recent years.

Pathology

When the organisms enter the tissues, the whole process depends on:

- The virulence of the organisms
- The body's ability to resist invasion (strength of immune system)
- The trauma inflicted to tissues
- The effectiveness of the antibiotic and the time of commencement

The first sign of genital tract infection is pyrexia with a rising pulse rate 24 hours or more after delivery.

Puerperal Sepsis

This is an infection of the genital tract occurring any time between rupture of membranes or labour and six weeks after delivery or abortion. Two or more of the following will be present; pelvic pain, fever, abnormal vaginal discharge, abnormal smell, foul odorous discharge and delay to uteral restitution. There are three types of puerperal sepsis: mild, moderate and severe.

Mild infection

The infection is usually localised to the specific tissues of the area, for example, the vagina, cervix or uterus. The temperature is gradually stepped up but rarely goes beyond 38℃. The mother may have no other complications or symptoms. With prompt appropriate antibiotic use, the condition should be cured within three to four days.

Moderate infection

When endometritis develops, it manifests in about 48 to 72 hours after delivery. The mother complains of loss of appetite, headache, backache and general discomfort. The pulse rate ranges from 100 - 120mmHg. The temperature is rarely above 38.8℃. The uterus is bulky and tender to the touch. Lochia discharge may decrease in amount. It is a red brownish colour and has a foul smell.

In cases of Haemolytic streptococcus, the lochia may be odourless initially. If the infection is contained in the endometrium, it clears within seven to ten days of treatment.

Severe infection

The virulent strain of haemolytic streptococcus rapidly infects the entire peritoneal cavity and causes septicaemia and haemolytic anaemia by gaining access to the circulatory system through the placental site. The mother will have a persistent fever of over 39℃, which may be continuous or remittent. Rigours are common and the pulse usually ranges from 140 - 160mmHg.

The uterus is sub-involuted and tender to the touch. Pallor is marked due to anaemia. There is persistent vomiting and sometimes diarrhoea. The mother appears very sick, restless and complains of insomnia.

Diagnostic Physical Examination

The following procedure should be followed when conducting a diagnostic examination:

- Head to toe examination should be done.
- Check on mucous membranes for pallor, throat for infection, breast for engorgement or swollen glands and abdomen for tenderness.
- Check the uterus for sub involution, and the perineum for any signs of infection from tears and episiotomy.
- Inspect the legs for any inflammation.

When carrying out investigations, the following steps should be taken:

- Take a high vaginal swab. The use of a speculum may be difficult, and no antiseptic solution or cream should be used to lubricate the speculum. Use aseptic technique.
- Sample blood for haemogram, WBC total and differential.
- In very serious cases blood culture is done.
- High vaginal swab for culture and sensitivity.
- Sample mid-stream urine for culture and sensitivity.

Medical Treatment

The following methods may be used to treat the condition:

- A broad spectrum antibiotic is given soon after the collection of vaginal and urine specimen to be changed when the result of high vaginal swab is ready.
- An analgesic in case of pain, and a sedative to ensure good sleep, is commenced.
- The mother should be placed on iron supplements if not on them already.
- If haemoglobin is below 7.4dl packed cell transfusion is recommended.

- Fluid and electrolytes balances should be ensured on a daily basis. In case of imbalance, 5% glucose infusion with added vitamins and potassium chloride is given.
- In case of infected perineal wound, the stitch should be clipped to allow drainage of pus.
- Localised infection is treated, with hydrogen peroxide and antibiotic spray.
- It may be necessary at times to incise and drain a pelvic abscess made through posterior vaginal fornix or rectum.

Nursing Care

You will now look at what kind of care should be provided to the mother. Isolate her until the cause has been identified, antibiotics started and the temperature has settled. Unless the mother is severely ill, the baby stays with her and the midwife will help her take care of the baby. Try to keep the mother free of stress and exhaustion.

You should nurse the mother in a propped up position with a pillow to encourage uterine drainage of lochia. Adoption of prone position for half an hour will also serve the same. Encourage the mother to eat a light nutritious diet, ensuring she takes plenty of fluids. You should reserve a bathtub for her use only if she is able to go to the bathroom.

She should have vulva swabs every four hours and change of beddings frequently. You should also check her pulse rate and blood pressure every four hours and carry out a daily head to toe examination to assess her condition.

Prevention of Post Partum Infection

The mother should be advised to eat a well balanced diet before and during pregnancy to prevent anaemia. She should receive early and regular prenatal care and exercise moderately, which will promote good health during pregnancy.

In the hospital, ensure proper infection control and monitoring, for example, cultures in the ward and nasal pharyngeal cultures from the personnel. Maintain the use of the aseptic technique. You will be able to minimise the risk of haemorrhage by proper management of the three stages of labour. Finally, you should try to prevent caesarean section whenever possible.

Breast Disorders During the Puerperal Period

Breast disorders may affect the whole breast or the nipples.

Engorgement of the Breast

On the third day postpartum secretion of milk begins. If the baby does not empty the breast it becomes over distended. The breast becomes enlarged and covered with distended veins, which are tender, hard and knotty. The mother may also have palpable nodules in the axilla and will experience sleepless nights due to pain.

Treatment of Engorged Breasts

In the early stages of engorgement, the breast may be emptied by manual expressing to relieve congestion. In the latter stage, the congestion and pressure of the ducts prevents the flow of milk. Manual expression of the breast should be done to promote flow of breast milk before the baby is fixed on the breast. When the mother cannot tolerate manual expression, electrical or manual breast pump should be used. You should administer an analgesic and ensure that the mother's breasts are effectively supported by a well-fitting, lactating bra.

Cracked Nipple

Sore nipples are caused by either the loss of the epithelium cover on a big area of the nipple or a deep, small, painful crack at either the tip or base of the nipple. The two conditions may also exist simultaneously. There are several reasons why cracked nipples may occur. These include:

- A flat nipple (try to pull it at 37 weeks to prevent infection and premature labour)
- Wet and unhygienic nipple
- Badly fixed baby on the breast covering the baby's nostrils
- Leaving the baby too long on the breast
- Untoughened breast during pregnancy

Certain complications may arise from this condition. There is a risk of formation of abscess as the ducts are not emptied and as a result of the raw area which allows access for micro-organisms.

Recommended Methods of Treatment for Cracked Nipples

- Rest the breast for 24 hours or until the crack is healed
- Meanwhile express the milk manually

- Expose the breast to the air for 20 minutes six hourly or to an electric lamp 30cm distance to promote healing
- Apply lanoline or massage cream ointment for soothing the nipple

Acute Puerperal Mastitis

Mastitis is the inflammation of the breast. If the condition is not treated, it may proceed to abscess formation. The term 'flushed breast' is applied in mild cases where the infection is superficial and localised. The condition rarely occurs prior to the eighth day of puerperium. It commonly arises during the second or third week. Mastitis may arise in two different ways. Cellulitis infection occurs when the infectious micro-organism enters through the cracked nipple and spreads through the interlobular tissue. Adenitis is a result of the multiplication of organisms which are already present in the breast itself due to engorgement, static of milk or bruising through careless handling.

Primary Causative Organisms of Mastitis

The primary causative organisms are streptococcus i.e. haemolytic streptococcus organisms and staphylococcus aureus. The usual route for transmission of organisms to the mother's breast is from the:

- Nasopharynx of her infant
- The patient's hands
- Nursery personnel in contact with the infant
- Skin infection of the baby
- The umbilical cord

The main signs and symptoms of the condition are:

- The mother complains of acute pain and tenderness in the breast
- General malaise characterised by a chilly sensation, followed by rise of temperature to 40℃ with increased pulse rate
- On inspection, the breast appears reddened and hard
- The inflammation may be generalised, confined to a lobe or a local area
- There are indurations, tenderness and erythema of the involved area
- Mastitis is usually unilateral, in advanced cases there maybe local abscess formation

Management of Mastitis

A sample of breast milk should be taken for bacteriological examination. Broad spectrum antibiotics should be administered immediately while awaiting the culture result. Depending upon virulence and resistance, cephalosporin or vancomycin drugs that are particularly effective against staphylococcal infections should be administered to prevent formation of breast abscess.

As soon as mastitis occurs, breast feeding on the affected area should be suspended. Empty the breast by gentle expression or with an electric breast pump. Support the breast with a firm breast binder or a well fitted brassiere. Heat application may be ordered to hasten the localisation of the abscess.

Abscess of the Breast

Acute mastitis may lead to a mammary abscess. Part of the breast becomes painful, tender, and oedematous with redness of the overlying skin. The axillary's glands become tender and enlarged. The abscess may form near the surface or in the substance of the breast. If untreated, a deep abscess may burrow in several directions affecting the whole breast.

Treatments for Abscesses of the Breast

Treatments include:

- Lactation is suppressed with Bromocriptine (2.5mg) twice for 14 days
- A radical incision is made externally from near the areola margin towards the perineal of the breast
- Avoid cutting the lactiferous ducts. Insert gauze drainage after you evacuate the pus
- Post-operative care is the same as for any surgical patient

In the case of breast abscess, there is need for urgent suppression of lactation. Bromocriptine (2.5mg BD) is given for 14 days, although it should be noted that this treatment is expensive. However, it is preferred to oestrogen due to the risk of varicose thrombosis with the latter. In many cases all that is needed is supporting the breasts firmly and limiting fluid intake.

Prevention of Breast Complications

Encourage breastfeeding by providing information on the advantage of breastfeeding. Educate the mother during prenatal care on the prevention of breast complications. Help her to fix the baby properly on the breast. Stress the

importance of emptying the breast by manual expression in case of excess milk, to avoid engorgement. You should also emphasise the importance of infection prevention, including prompt treatment of any members of the family with boils, burns or any skin lesions.

Extra Genital Infection

Urinary Tract Infection
Pyelonephritis occurs in a number of cases during the puerperium. Proper treatment during pregnancy will prevent recurrence of the condition. For more information regarding urinary tract infections, refer to unit five.

Respiratory Infection
A respiratory infection may cause puerperal pyrexia. The possibility of sepsis must be ruled out; otherwise both conditions may be present at the same time. For more information on respiratory management, see unit five.

Venous Thrombosis

This refers to the formation of clots in the veins, usually in the lower limbs. Puerperal mothers are prone to venous thrombosis. Puerperal mothers who have had a caesarean section often haemorrhage and after a difficult delivery it may take a longer time for her to move around. Another possible cause of the condition is varicosity, which may occur during delivery due to injury or inflammation. Mothers over 35 years and those with high parity are also at high risk.

Prophylaxis
During pregnancy you should ensure that pregnant mothers with thrombo-embolic disorders are not given oestrogen preparations and are encouraged to do exercise. Pregnant women with marked varicose veins should wear embolic stockings or crepe bandage. Mothers at a high risk of developing thrombosis or pulmonary embolism should be given a low dose of heparin 5,000 units subcutaneous.

SECTION 5: OBSTETRIC ANAESTHESIA, OPERATIONS AND EMERGENCIES

Introduction

You are now in the fifth section of this unit on labour. In the previous section you learnt that abnormal labour presents special challenges and carries many risks. This is why you should refer such women to the doctor in the prenatal clinic during their third trimester. They should also be advised to deliver in the hospital, as they may need a caesarean section.
In this section, you will study obstetric anaesthesia, operations and emergencies.

Objectives

By the end of this section you will be able to:

- Describe obstetric anaesthesia
- Describe the management of obstetric operations
- Describe the management of obstetric emergencies

Obstetric Anaesthesia

By the end of this topic you will be able to:

- Differentiate between anaesthesia and analgesia
- Describe the risks associated with anaesthesia with particular emphasis on how to prevent these risks
- Describe the role of a midwife in the administration of anaesthesia

Anaesthesia means absence of sensation and freedom from pain. General anaesthesia is the induction of unconsciousness, which may also involve the giving of some analgesia.

Regional anaesthesia is when a group of nerves is made free of sensation. Local anaesthesia is when a specific area of the body is anaesthetised e.g. the perineal area when repairing an episiotomy perineal or vaginal tear.
Each of these three categories of anaesthesia will be covered in this topic.
Remember: General anaesthesia for a pregnant woman in her second and third trimesters, or for a mother who has just delivered, is dangerous due to the effect of progesterone.

General Anaesthesia

It is essential that only trained anaesthesia personnel administer general anaesthesia to patients. Moreover, it is essential to place an endotracheal tube in all pregnant patients undergoing general anaesthesia, since the risk of aspiration pneumonitis, secondary to the inhalation of gastric content, is a significant one.

Until the baby is born, the mother should receive 100% oxygen and a low concentration of an inhalation agent such as isoflurane 0.5%. After delivery anaesthesia can be deepened by supplementing the anaesthetic with higher concentrations of potent volatile inhalation agents.
Factors connected with anaesthesia have been a significant cause of maternal deaths until very recently. It is essential for the midwife to be aware of the risks associated with anaesthesia and why they occur, so as to give intelligent help to assist the operating team and the patient.

Problems in Obstetrics Anaesthesia

In obstetrics the anaesthetic problems are due to:

- Effects of progesterone on the mother
- The pressure from the gravid uterus
- The presence of two patients rather than one patient

Some of the problems include; Mendelson's syndrome, failed intubation, aortalcaval occlusion and maternal awareness.

Mendelson’s Syndrome

It is believed that in pregnancy and especially in advanced labour there is a delay in gastric emptying time, due to the effect of progesterone on the gastro-intestinal tract.
Narcotic analgesics like pethidine that are given in labour, cause significant delay in gastric emptying. The static stomach content raises the pH. Fasting also gives similar reactions. The pressure from the gravid uterus results in the reflux of the contents in the stomach when the mother is in recumbent position. When she is under general anaesthetic unnoticed regurgitation may occur. In cases where the acid stomach contents are aspirated into the lungs, a condition known as Mendelson’s Syndrome result. The alveoli are damaged which causes the impairment of gaseous exchange. It is impossible to oxygenate the mother and in severe cases death may ensue.

Prevention of Mendelson’s Syndrome

The main method of prevention is the administration of antacid therapy while in labour to high risk patients.

Rapid Sequence Induction
Rapid sequence induction is used for unprepared patients. Prepared obstetric patients are also liable to have acid contents in the stomach and the same technique is used. The method always includes endo-tracheal intubation with the use of cricoid pressure, which protects the lungs even when silent regurgitation occurs.

Cricoid Pressure

The cricoid cartilage is pressurised to close the oesophagus, preventing acid reflux. This pressure is essential in preventing the death of the mother. Proper application of cricoid pressure is essential. When intubation fails and the anaesthetist is able to maintain a clear airway, a facemask should be used while the assistant maintains cricoid pressure. Another option is spinal anaesthesia, after waking the mother.

Failed Intubation

This usually occurs in pregnant women with laryngeal oedema due to pregnancy and induced hypertension. The anaesthetist has difficulties visualising the vocal cords and introducing the tracheal tube. Other factors include poor opening of the mouth and a stiff or fat neck.

Prevention
Use a pre-oxygenation technique, which involves giving facemask oxygen for four minutes uninterrupted. This will prevent cyanosis significantly when attempting to intubate.

Aortocaval occlusion

You will now look at aortocaval occlusion and its prevention. The cause of aortocaval occlusion is the weight of the gravid uterus, which partially blocks the inferior vena cava. The venous return is then reduced, which in turn leads to a fall of cardiac output. This occurs when a pregnant

woman lies supine in late pregnancy for a long period in labour. If an emergency caesarean section is being performed due to foetal distress, aortocaval occlusion increases the foetal distress and causes further foetal hypoxia.

Do you know how this might be prevented?
This condition can be prevented by encouraging the mother in labour to remain in an upright position for as long as possible. During labour, when the woman needs to lie flat, the midwife should ensure she is tilted to the left, either with a small rubber wedge under the mattress or a folded blanket under the left buttock at an angle of 15°. Modern delivery beds, chairs and operation tables have this facility incorporated.

Maternal Awareness
While giving general anaesthesia most of the drugs, except muscle relaxants, will pass the placental barrier and result in a sleepy baby. To prevent this, a light anaesthetic agent is given. The woman retains a high level of consciousness and she is able to recall events that occurred during the operation. However, she is unable to give any indication of sensation since she is paralysed. A woman who has retained awareness cannot recall pain but recalls the whole conversation during the operation. This can be a terrifying experience, since she may not want to know what was happening.
Awareness often occurs when nitrous oxide is used alone.
The addition of an opiate intravenously as soon as the baby is delivered is known to reduce maternal awareness significantly. In order to prevent maternal awareness you should maintain neither too deep nor too light a level of anaesthesia for the mother. In this manner, you will also be able to prevent Mendelson's Syndrome, aortocaval occlusion and foetal hypoxia.

Regional Anaesthesia
The operational region is made free from pain by infiltrating an anaesthetic drug into the nerves supplying the region. This can be achieved in several ways i.e. epidural block, spinal anaesthesia, pudendal block and para cervical block.

Epidural Block

Epidural analgesia is described as lumbar or caudal, depending on the site used when approaching the epidural space. This is achieved by infiltrating anaesthetic into the epidural space so that it surrounds the fibres of the specific spinal nerves and anaesthetises them, thereby achieving a selective block. This can be done in two ways:

Lumbar Epidural Block

This is the most common approach and there are three different techniques which may be used. The anaesthetic is introduced between lumbar vertebrae two and three, or three and four.
First technique: A single shot epidural refers to the process whereby local anaesthesia is introduced using a Touhy needle, but no catheter is inserted for topping up purposes.

Second technique: Intermittent technique is when a polyethylene or nylon catheter is inserted into the epidural space so that further doses of local anaesthetic may be given when required.
Third technique: The continuous technique is where anaesthetic solution is infused via epidural catheter using an intravenous infusion line attached to an electronic drip counter.

Caudal Epidural Block

This is an uncommon technique. The epidural needle is introduced between the sacral vertebra and cocyxiatus through the sacral hiatus.

Contraindications for caudal epidural block include:

- Maternal reluctance
- Bleeding disorders
- Systemic or site infection
- Existing disease, for example, multiple blood vessels sclerosis

Regional Anaesthesia

You will now look at some of the indications of epidural analgesia. These include:

- Request of the mother
- Malposition where long, exhausting labour is anticipated
- Malpresentation, particularly breech presentation, where an obstetrician requires a well relaxed mother to perform an assisted breech delivery

- Multiple pregnancy where an epidural analgesia is advantageous because it allows for the possibility of manipulative delivery
- When the mother is not obtaining adequate pain relief from other analgesic methods and is tense and distressed

There are several complications, which may arise from the use of anaesthetics. You will now study each of these in turn.

Complications of Regional Anaesthesia

Hypotension

This occurs as a result of the effect of vasodilatation of the blood vessels. Rapid intravenous infusion can prevent the condition. This is commonly known as a preload and commonly consists of between 500ml and 1000ml of Hartman's solution. A functional intravenous infusion is essential before epidural analgesia is commenced in order to prevent hypotension.

Dural Tap

This is the accidental puncture of the durameter. This is recognised when a few drops of Cerebrospinal Fluid (CSF) seep through the Tuohy needle. In order to prevent this condition, the anaesthetist normally re-sites the epidural catheter in an adjacent space. The obstetrician is informed and a forceps delivery will be planned in order to prevent the woman from pushing and possibly forcing more CSF through the
dural puncture.

A reduction of CSF volume usually results in severe headache, which resolves spontaneously within a week. Another measure to minimise leakage of CSF is to leave the epidural catheter in position and infuse normal saline with the help of an infusion pump. This is normally continued for 24 hours while the woman is lying flat.

For quick relief of the headache, the anaesthetist may decide to perform a 'blood patch', that is under strict asepsis taking between 10ml – 20ml of venous blood from the woman's antecubital vein and introducing it into the epidural space via the intervertebral space nearest the dural puncture. This results in immediate cure of the headache.

The woman is left to rest for an hour or two to avoid disturbing the clot, which has sealed the dural puncture. It carries risks of infection but the success rate is 90% on the first occasion and 98% if the procedure is repeated.

Total Spinal Block

This is a rare complication. It occurs when by mistake there is a dural puncture that fails to be recognised and the anaesthetist injects the local anaesthetic solution. This results in rapid motor and sensory block with a drastic fall of blood pressure. The mother collapses and cardiac arrest may follow. If this happens, immediate resuscitation is essential and ventilator support is required.

Occasionally, this effect is seen following a later top up and not during the initial stages of epidural analgesics. The reason for this is unclear but, in some cases, the epidural catheter is thought to have migrated. The midwife who tops up an epidural must be aware of these possible complications and their immediate treatment.

Bloody Tap

This happens when the anaesthetist punctures one of the epidural veins. Blood is seen in the catheter. In this case the epidural catheter is re-sited in order to prevent intravenous injection of local anaesthetic solution. If local anaesthetic is injected in the vein, toxicity will result and the woman will complain of tingling or numbness of the mouth and tongue, and dizziness. Her speech may be slurred and she may finally have convulsions.

Patchy Block

This is when an epidural block is sometimes more effective on one side of the body or is completely unilateral for no obvious reason. If this occurs the anaesthetist should be informed to adjust the epidural catheter.

Disadvantages of Local Anaesthesia

There are several disadvantages of local anaesthetics. These include:

- Unpleasant experience to the woman who may lose sensation and motor function in her legs
- Being unable to pass urine due to unawareness of a full bladder

The epidural block may also contribute to the following symptoms in the postnatal period:

- Impaired bladder function

- Marked perineal pain
- Backache due to trauma by the Tuohy needle during the epidural procedure

Drugs Used in Epidural Analgesia

There are several drugs used in epidural analgesia. These are:

Bupivacaine

This is administered in strengths of 0.25% and 0.5% and these concentrations are modified as required by diluting with normal saline. It is effective within 10 - 20 minutes of administration and lasts for about two hours during labour. The total dose given is not excessive unless labour is prolonged and toxicity is not common.

Ropivacain (Naropin)

This analgesic is good in low concentration with minimal and non-progressive motor block. Its long acting action makes it suitable for use in labour.

Opiates

Drugs in this group include:

- Diamorphine
- Morphine
- Pethidine

These are good post operative analgesics and neither cause hypotension, nor cause motor or sympathetic block. They are not as effective as might be expected in relieving labour pains but are commonly used in our hospitals following caesarean sections due to the pleasant feeling of wellbeing they induce. There is some risk of respiratory depression, although this risk is minimal.

Lignocaine

This is usually administered in the strength of 0.5 - 1% and is one of the more effective local anaesthetics available for epidural administration. The short acting span makes it unsuitable for use through out labour since a large dose may be needed and toxicity is therefore a risk. If the woman is very distressed it may be used for the initial dose and Bupivacaine can be used thereafter.

Spinal Anaesthesia

Although spinal anaesthesia provides for pain relief at the time of delivery, it is not suitable for use during labour as it decreases the strength of the labour contractions. It is suitable for caesarean section provided the operation is not prolonged beyond the effective time of the anaesthetic solution in use.
A spinal block is performed in a manner similar to an epidural block but in this case a local anaesthestic solution is injected into the sub-arachnoid space, i.e. in to the cerebrospinal fluid.The woman will have total motor control and sensory block over and below the anaesthetised areas.
There is a greater risk of hypotension with spinal than with epidural block. Blood pressure should be monitored carefully as should the the bladder contents.

Pudendal Block
Thjs is a technique that is used to anaesthetise areas that are supplied by pudendal nerve, namely lower vargina, perineum and vulva. This method is very unreliable and does not give adequate analgesia.

Para Cervical Block
In this technique the para cervical plexus is blocked, this gives pain relief for the first stage of labour but each injection is only effective for about three hours.
The technique is not favourable since the uterine artery passes close to the nerve plexus and inadvertent intra-arterial injection of even a small amount of anaesthesia would lead to foetal bradycardia or intrauterine death.

Local Anaesthesia
Perineal infiltration is very common among midwives who perform it before repairing episiotomies, perineal tears or vaginal tears. Lignocain is commonly used, but there is need for caution as levels above 200ml of 1% solution leads to risk of toxicity.

The midwife should really minimise the risk of intravenous injection, by being observant of the presence of blood in the solution after withdrawing the piston prior to injection.

Inhalation Anaesthesia

This is a process by which you administer volatile agents using a facemask in pain relief. It

is indicated in the late first stage and during the second stage of labour.
Explain the procedure to the mother to ensure her cooperation. You should let her know that it will relieve the pain. Tell her to breathe in during a contraction and rest during the time the contraction wears off. She has to breathe in for at least 15 to 35 seconds at the beginning of a contraction.
It is contra-indicated under the following circumstances:

- Antepartum haemorrhage
- Preeclampsia
- Anaemia
- Congestive cardiac failure
- In all cases with placental insufficiency
- Maternal and foetal distress
- Intra uterine growth retardation

What are the main advantages of inhalation anaesthesia?

- It is easy to use
- It can be used by any competent midwife without supervision so long as she knows how to regulate the flow
- Inhalation anaesthesia has shortlived effect on pain relief with no complications to the baby

There are two types of inhalation anaesthesia. These are called:

- Tritene or trichoboroethylene
- Entonox

Tritene

This has a composition of upto 0.5% of tritene in air. It is blue in colour and a volatile agent. One of the main side effects of this drug is that it accumulates in the maternal blood stream causing sleep but also, at times, disorientation. When this happens you must stop the inhalation. It also accumulates in the foetus, causing drowsiness at birth. It should not be administered for more than four hours. Once the drug is stopped the effect is short lived.

Entonox

This drug is composed of 50% nitrous oxide and 50% oxygen. When used in high concentration it is suitable for anaesthesia.
It has no side effects.

Responsibilities of the Midwife
The main responsibilities of the midwife include:

- Preparing equipment and ensuring it is in good working order
- Staying with the patient so as to instruct her on how to use the inhalation apparatus
- The midwife should know how the apparatus is used

Obstetric Operations

You will now study obstetric operations. The easiest and most important operation is the episiotomy. This is a technique each midwife should master while in the labour ward. This competence is achieved through observing an experienced midwife conducting the procedure. It is an aseptic procedure.

Episiotomy is invasion through the perineal tissues, which is designed to enlarge the vulva outlet during delivery.

Remember:
Give an episiotomy only when indicated.

The main indications of an episiotomy are:

- Rigid perineum, mostly in primigravidae
- Poor maternal effort or maternal distress in second stage
- In case of foetal distress in second stage to hasten delivery
- When the perineum threatens to tear, for example, in persistent occipito posterior
- Prior to assisted delivery such as in low forceps or vacuum delivery
- Preeclamptic mother
- In mothers who have medical conditions such as cardiac disease or diabetes mellitus
- In premature labour to minimise the risks of intracranial injury to the baby
- In case the mother has had previous third degree tears which had been repaired
- In malpresentation like breech delivery to prevent risks of intracranial injury to the baby

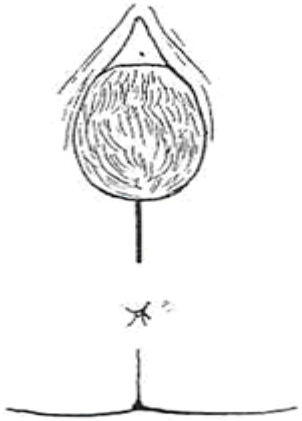
There are several types of episiotomy incisions.

Mediolateral Episiotomy

This is the most commonly performed episiotomy due to its safety record. However, it is difficult to repair. It begins at the centre of the fourchette, directed posteriorly and laterally the incision is not more than 3cm at 45° to the midline. Move towards a point midway between ischio-tuberosity and the anus. This is to avoid damaging the anal sphincter and the Bartholin's glands.

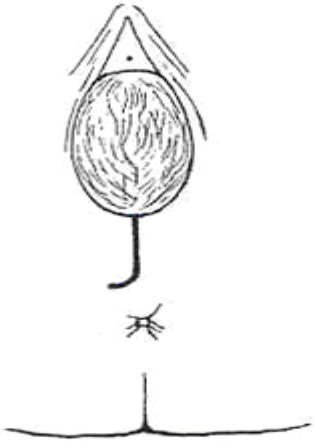
Median Episiotomy

This begins at the fourchette, is directed posteriorly for approximately 2.5cms and stops just before the anal sphincter. It follows the insertion of perennial muscles and has minimal bleeding due to few blood vessels in this area. It is easy to repair, less painful and rarely causes dypareunia. However there is the danger of the incision extending to the anal sphincter.



J Shaped Episiotomy

The incision begins at the centre of the fourchette, is directed posterior for about 2cm and then it is extended latero-posteriorly to avoid damage to the anal sphincter. Suturing of this episiotomy is very difficult.



Lateral

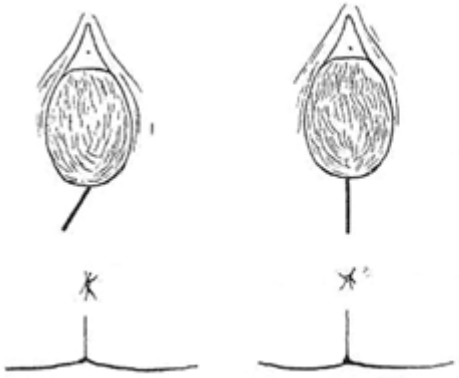
Not used now. Unlike in all the other types, the incision does not begin at the centre of the fouchette but on the side of the vaginal opening. The incision may extend leading to a severe vaginal tear and excessive bleeding.

Remember: Episiotomy can comfortably be given without local anaesthesia at the height of a contraction. The first and the second types are more preferred.

Performing an Episiotomy

The timing of the incision is very important. It is best timed when the presenting part is directly applied to the perineum. If the episiotomy is performed too early, it exposes the mother to a lot of bleeding. If performed too late, there will not be enough time to infiltrate the local anaesthesia. A tear may already have developed before the midwife gives an episiotomy.
The main requirement for the procedure is a trolley with:

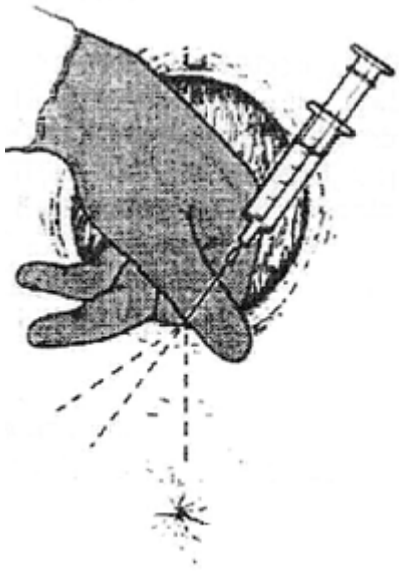
- Suture pack
- 10mls syringes and needles Lignocaine (0.5% 10ml or 1% 5mls)
- Chromic catgut
- Needle holder
- Suturing scissors
- Artery forceps
- Toothed dissecting forceps.
- Mayo scissors



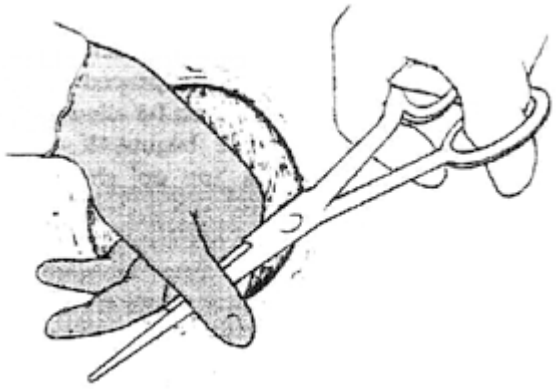
Procedure

When the head reaches the pelvic floor, two fingers of the left hand are inserted between the perineum and the foetal head. Lignocaine, 0.5%, is infiltrated into the area where the incision has to be made. Using the right hand, the midwife places the tip of the opened scissors and makes an incision at the height of a contraction.

Infiltrating the Perineum



Performing an Episiotomy



Delivery of the head should follow immediately and it should be controlled to avoid extension of the episiotomy. If there is delay before the head emerges, apply pressure at the episiotomy site between contractions to minimise bleeding. Use aseptic techniques.

The Method Used and the Toxic Signs of Local Anaesthesia

The following method should be used:

- Direct your needle 4.5cm beneath the skin of the proposed site of injection
- Ensure the needle is not in the blood vessel by drawing back the piston
- If you withdraw blood, redirect the needle
- Inject the lignocaine as you withdraw the needle

- Distribute the anaesthesia by changing direction of the needle to two or more areas on the proposed injection site

The following are toxic signs of local anaesthesia that you should be aware of:

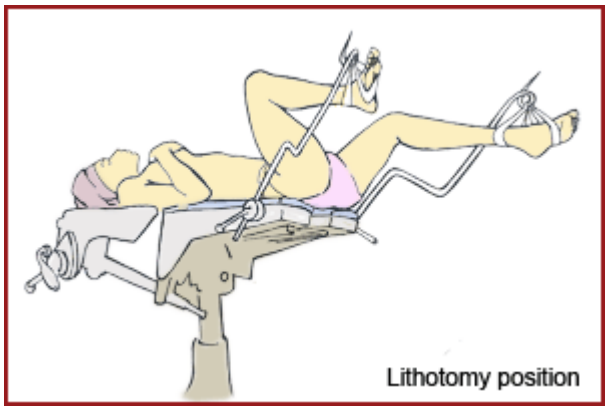
- Drowsiness
- Twitching of the face/lips
- Tingling in the area of the mouth
- Convulsion
- Circulatory collapse
- Respiratory collapse

If the above signs are noted, call for medical help (anaesthetist) and resuscitate.

Repair of the Episiotomy

The episiotomy should be repaired as soon as possible (immediately after the third stage) before oedema sets in and while tissues are still anaesthetised. You will need a good source of direct light. The patient is placed in the lithotomy position. The midwife should be seated comfortably during the procedure.

An aseptic technique must be maintained throughout the procedure. The vagina and the episiotomy site are cleaned with antiseptic lotion and the midwife should have a sterile gown and gloves on. Sterile gauze is inserted into the vagina to absorb blood and keep the operation site dry. Absorbable sutures are used. The repair begins at the apex of the vaginal wound. A continuous or interrupted stitch is used, started from the apex to the fourchette bringing the two edges of the wound together. The perineal muscles are then sutured and finally the skin is sutured.



The stitches should just be firm enough. If they are too loose, they may cause oedema and if they are too tight, the mother will be very uncomfortable. After suturing, remove the pack from the vagina and note on the mother's card that the pack has been removed. Insert the little finger into the anal orifice to make sure the two orifices have not been stitched together and the vaginal orifice isstill patent.

The repair from the apex of the vagina

The fascia and muscle of perineum are repaired with three or four interrupted sutures

Skin suture

Care of the Episiotomy

Advise the mother on how to take care of the episiotomy site.

This includes:

- Four hourly seat baths
- Change the perineal pad whenever it is soiled
- Avoid coitus until the episiotomy wound is healed
- Take a balanced diet to promote healing
- Maintain good hygiene
- Avoid constipation by taking plenty of fluids and roughage, constipation would cause stretching of the sutures during defecation

Possible complications to be on the look out for include:

- Infections leading to broken episiotomy
- Haematoma formation at the site of the episiotomy haemorrhage

Vacuum Extraction (Ventouse) Delivery

Younge invented the basic idea for the vacuum extractor in 1706 when he used a glass suction cup. In 1849, Simpson designed the instrument, but at the time it was hardly used. In 1774 Mostron introduced the modern vacuum extractor. There are opinions about the value in assisting delivery by this method and it is rarely used these days. However, it is still useful in remote areas.

Indications for vaccum delivery:

- Mild foetal distress
- Delay in second stage of labour
- Malposition; occipital lateral and occipital posterior positions
- Maternal exhaustion

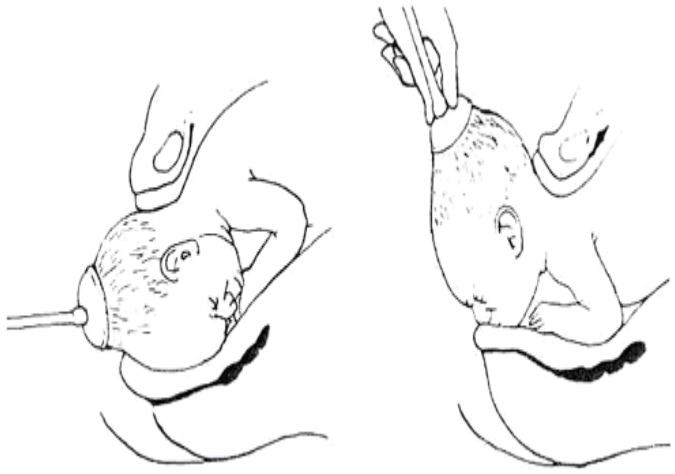
The Procedure

The following steps should be followed when conducting this procedure:

- Reassure the mother and explain the necessity of this procedure
- The paediatrician should be present
- Explain to the mother that the baby will have chignon (an area of oedema and bruising where the cup is applied) but this will disappear after some hours
- Equipment as for normal delivery with the addition of vacuum equipment
- The mother should be placed in the lithotomy position
- The doctor should assemble the cup and tubing
- The nurse attaches the distal end to the suction
- The doctor should then swab and prepare the mother
- Catheterisation is done to empty the bladder
- The perineum should be infiltrated with 1% lignocaine
- The cup should be dipped in sterile water then introduced sideways into the vagina by pressing backwards against the perineum
- It is placed on the scalp as near as possible to the posterior fontanelle
- Care should be taken not to trap the cervix or the vaginal wall under the cup

While the doctor holds the cup in the correct position:

- The pressure causes an artificial caput succedaneum or chignon, when vacuum reaches 0.8kg/cm the cup is completely filled with scalp
- Traction on the handle should be made as nearly vertically to the cup as possible as oblique direction may pull the cup off
- The nurse uses the hand pump to create vacuum gradually
- Increase negative pressure by 0.2kg/cm at one minute interval until 0.8kg/cm is attained



he procedure continues as follows:

- Intermittent traction is applied with uterine contraction

- Direction of pull changes as the head descends through the birth canal
- When crowning takes place episiotomy is performed if necessary
- The use of ventouse should be reconsidered if there is no obvious descent after three to four contractions
- To prevent damage to the scalp, the vacuum is reduced as slowly as it was created after delivery of the head by opening the screw release valve
- The cup is then detached
- Should the cup detach itself, it is probably due to pulling in the wrong direction or using too much force
- A vacuum should be created again and if the chignon is large, then another area on the scalp is used

Remember:
Never use the cup actively to rotate the baby's head during the procedure. Do not continue this procedure for more than 30 minutes.

What complications should you watch out for during and after the procedure?
- Failure of the procedure
- Trauma to the foetal scalp
- Chignon, that is, oedema and bruising where the cup had been applied, which can occasionally get infected
- Some babies develop cephallohaematoma
- Intracranial haemorrhage
- Necrosis of the scalp
- Aponeurotic haematoma
- These complications occur mainly due to some degree of disproportion where the cup has been applied for long period and forceful traction used

Forceps Delivery

This procedure is performed by a forceps which is an instrument that has two parts that cross each other like scissors and lock at the intersection. The lock may be of sliding type or of screw type. Each part consists of a handle, a lock, a shank and a blade. The blade is joined to the handle by a shank. The blade has two curves, cephalic curve to fit the head, and pelvic curve that correspond with the curved axis of the pelvis. The length of the handles differ, so do the types of handles.

There are several types of forceps including Kielland's, Simpson's, Wrigley's, Neville-Barne's, Haig-Fwerguson's, Milne-Murray and Diper forceps among others.

Types of Forceps Delivery

Low Forceps

Today the majority of forceps delivery is carried out when the foetal head is on the perineal floor whereby the internal rotation may have already occurred. This is called outlet forceps or low forceps delivery.

Mid Forceps

This is when the head is higher in the pelvis but engaged and the greater diameter has passed the inlet. This is known as mid forceps.

High Forceps

If the head is not engaged, the procedure is termed high forceps. This is an extremely difficult and dangerous operation. A caesarean section is usually preferred to mid/high forceps.

What conditions have to be present for a forceps delivery?
Conditions considered for forceps delivery include:
- Presentation must be suitable
- Head has to be engaged
- The pelvic outlet needs to be adequate
- Good uterine contraction
- Membranes should be ruptured
- Bladder must be empty

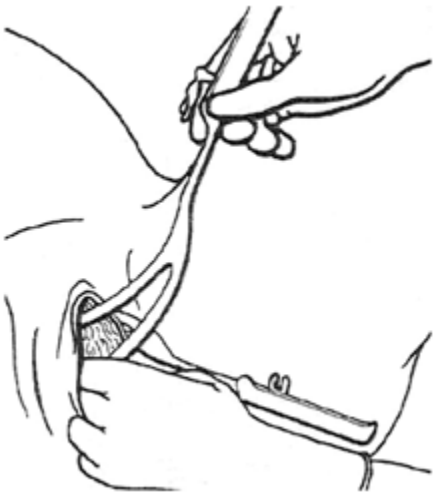
What steps should be taken before the application of forceps?
The following steps should be taken before the application of forceps:
- Reassure the mother and explain the procedure.
- Obtain consent from the mother.
- Some form of analgesia is given. Pundental or epidural block is preferred to general anaesthesia.
- Ensure requirements for catheterisation, episiotomy and perineal sutures are at hand.
- Resuscitation trolley must be ready.
- Delivery trolley should be ready as for spontaneous delivery.

- The specific type of forceps as per doctor's requirement.

Procedure

The following procedure should be followed:

- The mother is given analgesia and placed in the lithotomy position.
- The vulva is swabbed and draped.
- Catheterisation is done.
- The physician checks the exact position of the foetal head by vaginal examination.
- The fingers of the right hand are passed in the vagina.
- The left blade is applied first and held by the left hand between the fingers and thumbs of the left hand.
- The blade is then passed between the head and the palm or surface of the right fingers. The handle is carried backwards towards the middle well over the mother's abdomen to the right side almost parallel with her right inguinal ligament.
- The above position of the blade will ensure the instrument follows the directions of both the pelvic and cephalic curve.
- After ascertaining it lies in the correct position next to the head, the fingers of the right hand are withdrawn.

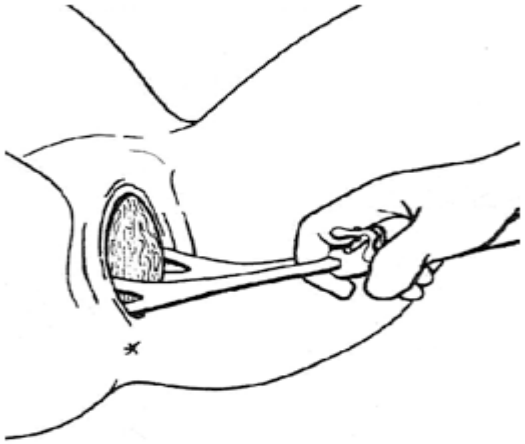


The same procedure is carried out on the right side. The external visible portion will be above the blade.

Positioning the Forceps

The shanks are pressed backwards against the perineum and the handle should lock and lie in a horizontal position. If the handle does not lock, the blades should be removed and the position of the head re-examined.

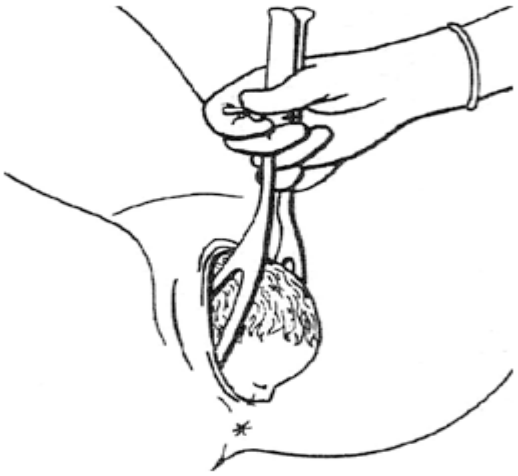
The ordinary curved forceps, if correctly applied on the foetal head, results in the fenestrate, 'window' of the blade lying over the pariental eminence. The fingers of the right hand resting on the cheek, guide the tip of the blade.



The Delivery Procedure

Before applying traction, ascertain that the cervix is not nipped between the foetal head and the forceps blade. Traction is applied during contractions, which should not exceed 15 seconds. Encourage the mother to push with every contraction. The lock on the handle should be loosened between contractions to reduce the skull pressure. Continuously monitor the foetal heart. The direction of pull is altered as the head descends to follow the curve of birth canal. If the head is mid cavity the direction of the pull is outwards.

The blades lie in submento vertical while the biparietal diameter is grasped. As the head descends, the handles are gradually raised to about 45° above the horizontal, and then episiotomy is performed through a stretched perineum. The head is then gently guided through the vulva until crowning takes place. The handles of the forceps should be in vertical position. After the head is properly crowned and ready for extension, the forceps are removed. The face is delivered by manual extension of the head.



You should note that the forceps delivery poses several dangers both to the mother and baby.

Do you know what these are?
In the case of the mother dangers arise from:

- Anaesthesia
- Laceration of cervix, vagina or perineum
- Postpartum haemorrhage
- Puerperium infection

In the case of the baby, danger may arise as a result of:

- Intra cranial haemorrhage
- Facial palsy
- Cephalohaematoma

Piper Forceps for Breech Delivery of

Aftercoming Head

The Piper forceps is used electively as a substitute in case of failure of Mauriceau-Smellie-Veit manoeuvre for delivery of the foetal head. The forceps are applied after delivery of the shoulder while the head is in the pelvis. The body and the arms are suspended with a towel. The left blade is introduced in an upward direction along the foetal head. The same is done to apply the right forceps.
The forceps are locked in place and the position of the head is confirmed by palpation. An episiotomy is performed in case it had not been done earlier. Traction is applied until the chin the mouth and nose emerge over the perineum. The forceps are removed and the mother is instructed to pant so that the head is delivered slowly.

Caesarean Section

Caeserian section is the delivery of the foetus through an incision made on the abdominal wall and uterus. It is considered a major abdominal surgery. The diminished danger of caesarean section has made it widely used and even abused at times.

Indications

The following are indications of caesarean section:

- Maternal or foetal distress during labour
- Pelvic tumour
- Diabetes mellitus
- Cephalopelvic disproportion
- Severe high blood pressure
- Abnormal uterine action
- Haemolytic diseases
- Failed induction
- Placenta previa
- Antepartum haemorrhage
- Gross disproportions
- Cervical or vaginal stenosis
- Fault in birth canal
- Double uterus
- Impacted mentoposterior
- Foetal malpresentation
- Shoulder presentation
- Breech presentation

Types of Caesarean Section
You should note that the forceps delivery poses several dangers both to the mother and baby.

What are the different types of caesarean section called?

- Lower segment section, which is the operation of choice
- Classical section
- Extraperitonial caesarean section
- Caesarean hysterectomy

Can you think why a lower segment section procedure would be the operation of choice?
The main advantages of lower segment section are:

- Blood loss is minimal
- Incision is easy to repair

- The risk of rupture during labour is lessened as the lower uterine segment has less uterine activity
- The operation is associated with lower incidence of postoperative infection

Lower Segment Caesarean Section

The following steps make up the procedure to be followed in the lower segment section:

- The bladder is emptied by catheterisation.
- Intravenous glucose saline is started (kept ready).
- The operation table is tilted to prevent compression of inferior vena cava.
- A transverse or vertical incision is made out of the lower subumbilical to open the peritoneal cavity.
- At the end of the wound a wide retractor is inserted.
- To push the bladder off from the lower segment, the uterovesical pouch is divided transversely for about 10cm.
- A transverse incision about 2cm long is made in the middle of the lower segment.
- Deepen until the membranes bulge.
- If possible the amnion sack should be kept intact.
- The incision is extended to 10cm by exerting traction using two index fingers at the incision.
- The membranes are ruptured.
- The hand is then slipped beside the head and the first blade of Wringley's forceps is applied, and the other follows.
- As the head is delivered gently with the forceps, the anaesthetist injects ten units of syntocinon intravenously.
- The shoulders are eased out carefully to avoid lateral splitting of the uterine wound.
- The delivered foetus is held upside down, the air passage cleared by suctioning.
- The cord is clamped and cut and the baby is handed to the assistant for further care.
- The placenta separates immediately and is delivered through the wound.
- The uterine incision is sutured with two layers with catgut or dexon.
- Any blood, liquor, vernix is removed from the peritoneal cavity and the wound closed.

Classical Caesarean Section

The incision is made directly into the wall of the body of the uterus. The procedure is rarely performed, its indications are:

- Gestation of less than 32 weeks (i.e before the lower segment has formed)
- Placenta previa which is anteriorly situated
- An hour glass contraction (constriction ring)

It is always performed through a midline incision.

Extra Peritoneal Caesarean Section Procedure

Access to the lower uterine segment is secured by appropriate dissection of tissues around the bladder to by pass the peritoneal cavity and the baby is extracted. As the peritoneal cavity is not disturbed there is no risk of introducing infection from infected liquor or infection from the uterus. This was a popular procedure in the pre-antibiotic era but is now outdated.

Caesarean Section Hysterectomy

This is also known as Porro's Operation. The removal of the uterus follows after caesarean section, due to other conditions of the uterus; such as placenta accreta, multiple fibroid tumours of the uterus and so on. On rare occasions and in conjuction with other gynaecological disorders this operation may be used for sterilisation purposes.

Elective Caesarean Section

The decision to deliver by caesarean section is made during pregnancy before the onset of labour. Some reasons for this decision are absolute while others depend on combination of factors and the opinion of the obstetrician.

Emergency Caesarean Section

This operation is performed when adverse conditions develop during labour. The psychological preparation of the mother for the operation is of paramount importance. You should be prepared to deal with the different

feelings of different mothers. An opportunity should be given to mothers to explore and express their feelings, be they fear, disappointment or frustration. This can be done in a group or individual counselling setting, where uncertainties and misunderstandings can be clarified. The nurse can be of great help acting as a mediator, fostering acceptance and sense of readiness to both the apprehensive mother and her partner

Pre-Operative Care For Elective

Caesarean Section

The following are characteristic of pre-operative care during an elective caesarean section:

- The doctor explains the procedure to the mother and her partner and consent is obtained.
- Physical examination is carried out to make sure the mother is fit for general anaesthesia
- Blood for haemoglobin, cross match and two pints of blood are kept ready.
- Mother is admitted and not fed overnight. Sodium amytal (200mg) is given to ensure a good night's sleep.
- The abdomen is cleaned in the morning.
- A bath is taken in the morning.
- A retention catheter is inserted to ensure an empty bladder through the operation.
- An intravenous infusion is started as per prescription.
- Valuables are kept safely.
- Nail polish, dentures, glasses or contact lenses are removed.
- Theatre gown, leggings and scarf are put on the mother.
- Pre-operative medication is usually administered half an hour before the operation (1m atropine and analgesic).
- Foetal heart, foetal position, and presentation are determined.
- Maternal observations are recorded: pulse, respiration, blood pressure and temperature.
- A urinalysis is carried out for albumin sugar.

Unanticipated Caesarean Section

In such a situation, the mother's anxiety will be high. Reassure the mother and explain the reasons for surgery. The procedure is the same as outlined for elective Caesarean but if food has been consumed, gastric lavage should be performed.

Remember: In some countries midwives are trained to perform caesarean sections.

Post Operative Care

This is the same care given to any woman who has undergone a major abdominal operation. For more details, refer to module one, unit four.
Additional care steps are also recommended. The mother should breast feed as soon as her condition permits. If for any reason she cannot breast feed, the breast should manually be expressed from the third day to prevent engorgement of the breasts. Four hourly vulva swabbing should be taken if the patient is confined to bed.
Remember that maternal mortality is four times greater than in normal labour. Elective sections usually have lower mortality rates but emergency cases are usually at high risk, especially due to the use of anaesthesia. Mothers who were in labour for a prolonged period are especially at risk of serious infection; so prophylactic antibiotics should always be used. A ruptured uterus is more rare here than in the lower segment section. All mothers with a caesarean section scar should be delivered in the hospital under vigilant observation.
The foetus is also at risk, given that respiratory problems may occur due to the anaesthesia. Intracranial damage may occur as a result of improper care during the delivery of the foetal head, which has to be brought up from the pelvis or through the small uterine incision.
Obstetric emergencies may occur suddenly or may be due to poor management or negligence on the part of the skilled medical personnel. You should always be vigilant in your observations in an effort to avoid such emergencies. When they do happen, you should be ready to respond in order to save lives and reduce morbidity and mortality.

Obstetric Emergencies

Obstetric Emergencies

You will now look at some obstetric emergencies and how you can prevent them and systematically deal with them.

Vasa Praevia

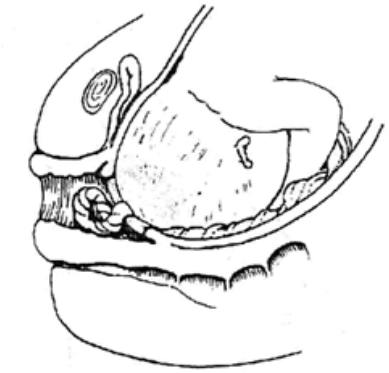
This condition occurs when there is a velamentous insertion and the blood vessel from the cord lies over the os, in front of the presenting part. This endangers the life of the foetus. Vasa praevia can be felt on virginal examination when the membranes are still intact. The condition can be visualised on ultrasound. A speculum examination should be undertaken if this is suspected. When the membranes rupture, the foetal vessel may also rupture. The rupture of vessels should be suspected when there is fresh bleeding after the rupture of the membranes following foetal distress.

Management of Vasa Praevia

You should inform the doctor immediately. Take the foetal heartbeat and, if the foetus is alive, administer oxygen and prepare the mother for caesarean section.
A paediatrician should be present at the time of delivery of the baby. The baby's haemoglobin should be estimated and transfused as necessary. There is high mortality associated with this condition.

Presentation of the Cord

This is a condition where the cord lies in front of the presenting part and the membranes are intact.
Cord prolapse is a term used when the umbilical cord lies in front of the presenting part and the membranes
are ruptured.
Occult prolapse describes the condition that occurs when the cord lies alongside, but not in front of, the presenting part.



Causes of Cord Prolapse

Any condition in which the presenting part does not fit well into the lower uterine segment will permit the umbilical cord to slip down in front of the presenting part, for example, malpresentation and malposition, breech presentation, face and brow presentation, shoulder presentation resulting from transverse lie and occipito posterior position.
Malpresentation, polyhydramnious and prematurity are conditions that are more common in multiple pregnancies, all of which can cause cord prolapse.

- Contracted pelvis: because the membranes may rupture before the head has engaged.
- Certain placental and cord conditions like low implantation of the placenta, marginal insertion of the cord and a long cord.
- High head: the membranes rupture spontaneously when the foetal head is still high. Also artificial rupture of the membranes is contraindicated in high head.
- Prematurity: there is more room between the small foetal head and the maternal pelvis.
- Polyhydramnios: the cord is likely to be swept down in a gush of liquor when the membranes
  rupture spontaneously.

How would you diagnose cord presentation or cord prolapse?

During labour cord presentation or prolapse can be diagnosed as follows:

- On vaginal examination a soft pulsating mass can be felt in front of the presenting part with the membranes intact.
- A cord may be felt in the vagina or seen at the vulva either pulsating or not pulsating.
- Whenever the membranes rupture a vaginal examination should be done to rule out cord prolapse.

Management of Cord Presentation

As soon as you get cord presentation, which is rare, you should remove your fingers, taking care not to rupture the membranes. Explain to

the mother the situation at hand. Ask your assistant to inform the doctor and theatre staff to prepare for emergency caesarean section while you prepare the mother for the section. Take the mother to theatre as soon as possible as the membranes may rupture at any minute.

Management of Cord Prolapse

If you diagnose prolapse of the cord while performing a vaginal examination, check for the following factors that determine the method of management. Check whether the pulsation of the cord cervical dilatation is in the first or second stage. Determine the adequacy of the pelvis. If the cord is pulsating you must act very fast in order to save the baby.

Pulsating Cord with Mother in First Stage

Explain to the mother the situation at hand while you push up the presenting part so as not to compress the cord. If the cord is outside the vagina, gently replace it in the vagina to prevent spasm and keep warm. Instruct your assistant to inform the obstetrician and the theatre staff, and keep the mother in knee chest position without removing your fingers. Continue elevating the presenting part until the patient is in theatre.

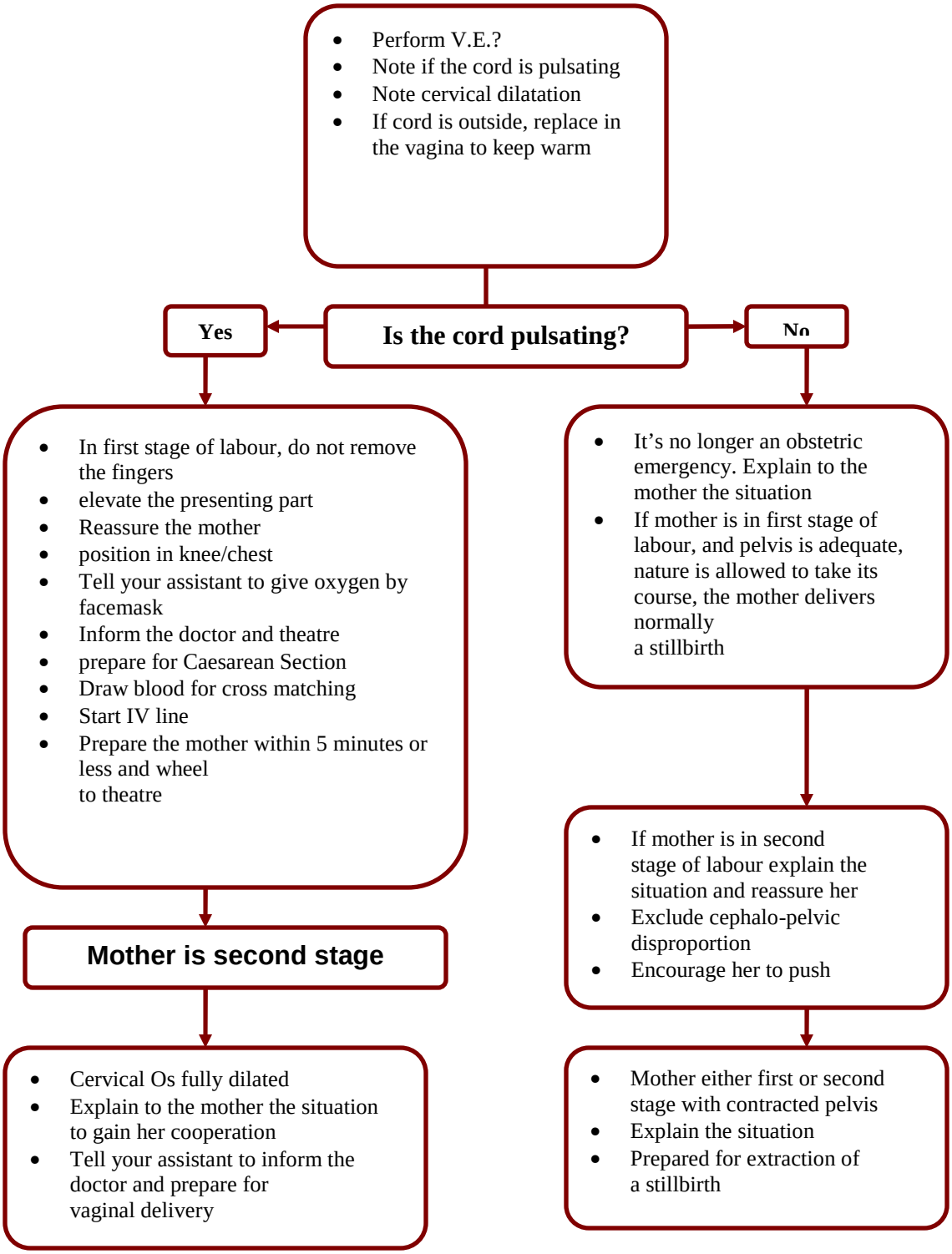
Your assistant should give the mother oxygen by facemask while someone else draws blood for grouping and cross matching. At this point you should commence an intravenous line and keep the vein open. The mother should be asked when she last had a meal and gastric aspiration should be commenced if necessary.

Once consent has been taken, the mother should be rushed to the theatre as soon as possible. If the cervical os is fully dilated and the pelvis is adequate, you should encourage the mother to push. Tell the assistant to inform the doctor and prepare for vacuum extraction. Continue encouraging the mother to push and give a generous episiotomy to hasten the delivery of the baby. Should the doctor arrive before the baby is out, he may perform vacuum extraction. If there is malpresentation, the patient should be quickly prepared for caesarean section as per steps above.

If the Cord is not Pulsating

The procedure to be followed varies from institution to institution. In some institutions you may be able to personally inform the patient of the situation. Otherwise, you may have to wait until the doctor comes to tell the patient about her dead foetus. If the patient is in first stage of labour and the pelvis is adequate, let nature take its course and deliver a fresh stillbirth. If the patient is in the second stage, she is encouraged to push and she will deliver a stillbirth. In case there is a contracted pelvis, a caesarean section should be performed in spite of the death of the foetus.

Management of Cord Prolapse



Post Partum Haemorrhage (PPH)

PPH can be defined as excessive bleeding of more than 500mls of blood from the genital tract after the birth of a baby or any amount that may lead to deterioration in the mother's condition. This is also known as Primary PPH. If the condition occurs after 24 hours of, and within six weeks after, delivery it is known as Secondary PPH.

There are several predisposing factors associated with PPH.

Can you think what theses are?

- Grand multipara, that is, high parity of more than five children and advanced age
- Precipitate labour, that is, rapidly progressing labour
- Over distension of the uterus resulting from polyhydramnios, multiple pregnancy or overly large infant
- Previous history of PPH
- Blood clotting/coagulation disorders and disseminated intravascular coagulation
- Preeclampsia and eclampsia
- Heavy sedative medication during labour or general anaesthesia

Primary Post Partum Haemorrhage

Bleeding occurs in the third stage of labour and within 24 hours after delivery. The main sources of the haemorrhage include:

- Placental site
- Lacerations of the genital tract
- Blood coagulation disorders

Haemorrhage from the Placental Site

Bleeding can also result from the mismanagement of the third stage of labour. If ergometrine or syntocinon is not given at the end of the second stage, it remains quiescent for a few minutes. While the placenta is still attached, no bleeding occurs. However, if there are any attempts to manipulate the uterus such as massaging, kneading, squeezing and pushing, this will over-stimulate the uterus and cause uncoordinated uterine contractions, hence bleeding will begin.

Injudicious attempts to expel the placenta before complete separation will cause PPH as well as inversion of the uterus. Additionally, a full/distended bladder during the third stage inhibits proper placental separation leading to haemorrhage.

An abnormally adherent placenta can also be problematic. In placenta acreta chorionic villi penetrate the myometrium to the peritoneal surface of the uterus. In placental praevia, the placenta has a wider area of attachment than normal and the lower uterine segment may fail to contract strongly enough to control bleeding.

Disseminated Intravascular Coagulation (DIC) and other clotting disorders are rare but can cause slow but persistent and dangerous haemorrhage. DIC is especially associated with concealed placenta, abrupt, amniotic embolism and dead foetus. Finally, fibroids can interfere with good muscular action and prevent the closure of the blood sinuses.

What are the Signs of Possible PPH?

- There is an escape of blood through the vagina.
- There is an abnormally high fundus and the uterus feels larger and softer than normal.
- The patient becomes shocked especially with concealed haemorrhage.
- With excessive haemorrhage the blood pressure falls, the pulse rate rises, pallor and air hunger may occur.
- Post partum necrosis of the anterior lobe of the pituitary gland is rare and occurs with low level blood pressure.

Prevention of Primary Post Partum Haemorrhage

You should be able to identify risk factors during the antenatal period through accurate history taking. Anaemia must be corrected during pregnancy. You should encourage hospital delivery, especially for women with a history of PPH, grand multipara or a history of APH.

For the mothers at risk of PPH infusion of syntocinon during labour until two hours after third stage is effective and safe for the mother. In case of prolonged labour induction can be done by use of syntocinon drip.

Ergomentrine or syntocinon should be given at crowning of the head or after delivery of the anterior shoulder of the foetus. The bladder should be emptied at the end of the first stage of labour. In anticipation of blood coagulation disorders, you should have ready two units of blood for women at risk.

Management of Primary Postpartum Haemorrhage

The main principles of treatment involve arresting the bleeding, restoration of the blood volume and treatment of circulatory failure (shock).

You should ascertain whether the uterus is contracted, if it is not, you should rub it to cause a contraction. Ask your assistant to repeat syntometrine if you administered this at the end of the second stage. If you had not, they can begin to administer syntometrine, put up an IV infusion of normal saline and call the doctor.

When you feel a contraction, deliver the placenta by using control cord transition. When the placenta is out you should continue to rub until the final contractions expel the clots and the bleeding stops.

However, if the mother is still bleeding and the placenta is out, the uterus is not well contracted. Quickly check for the completeness of the placenta. If the placenta is complete, perform a bimanual compression whereby the right hand is inserted into the vagina in the anterior fornix above the cervix, and the left hand is placed on the abdomen and pressed downwards onto the posterior wall of the uterus so that it is compressed between the two hands. The doctor will order syntocinon drip 40 units at 40 drops per minute.

Maintain firm pressure till the uterus is felt to contract; bleeding will stop.

Management of Primary Postpartum Haemorrhage

If the placenta is not complete, do a bimanual compression IV with 40 units of syntocinon. Ask your assistant to inform theatre staff to prepare for exploration under general anaesthesia. Prepare the patient for theatre, ready to be transferred when the doctor arrives.

If the placenta has not separated and remains in the upper uterine segment, manual removal of the placenta under general anaesthesia is performed. If bleeding still continues (and is not due to a clotting defect) tying of the internal iliac arteries or even hysterectomy may be considered.

However, you should check the haemoglobin level and determine the need for haematinics or transfusion with blood. If the placenta is delivered and is complete and the uterus is well contracted but the mother is still bleeding, check the birth canal for any tear, which may be the cause of bleeding.

If the placenta is delivered, the uterus is well contracted and there is no tear of the perineum, which is bleeding, then you should suspect coagulation disorders. The doctor will commence the mother on fibrogen while preparation is made to transfuse fresh blood.

Haemorrhage from Lacerations

Bleeding resulting from lacerations may occur from the cervix, the wall of the vagina, at the apex of an episiotomy wound, and/or a tear.

This usually occurs during the Spontaneous Vaginal Delivery (SVD) of a large (macrosonic) baby or when a large diameter presents in face, extraction of the after coming head in breech presentation, or due to difficult instrumental delivery.

The main signs of SVD are that the bleeding starts immediately the baby is born, the blood flow is continuous and/or the uterus is firmly contracted.

Can you think of the management of lacerations?

The Management of Lacerations

In a lithotomy position examine the patient's birth canal to determine the location and extent of the tear. Apply pressure to the tears till they are sutured. Use aseptic technique to suture the tears. Remember that proper retractors and instruments are needed to suture a high cervical tear.

Profuse haemorrhage from a cervical tear involving a branch of the uterine artery can be temporarily controlled by clamping the artery with an artery forceps till the patient is taken to theatre. A seat bath after the suturing helps to clean the area. Antibiotics should be prescribed to prevent infection. You should also determine the level of bleeding to determine the need for transfusion or haematinics.

Blood Coagulation Disorders

In the event that the patient has a coagulation disorder, she may bleed profusely. You can diagnose this by doing a bedside clotting time to rule out DIC. Clotting time that is more than seven minutes is suggestive of DIC. In this case start management as follows:

- Keep the patient warm
- Give fresh whole blood

- Give fresh frozen plasma
- Give platelets concentrates

This type of care may not be available in small health institutions hence the need for referral. If bleeding persists utero-ovarian artery ligation or subtotal hysterectomy should be considered.

Secondary Post Partum Haemorrhage

This usually occurs 24 hours after delivery or up to six weeks post delivery. The mother may present with retention of a placenta piece/products of conception, blood clots or puerperal sepsis, especially due to caesarean section. There may be low grade fever, lochia is usually heavier than normal and bright red in colour. Sub involution is present.

Can you think how to manage a secondary post haemorrhage?

The Management of a Secondary Post Haemorrhage

Mothers are usually readmitted during the puerperal period. Call for the doctor. If the uterus still palpates, stimulate it to induce a contraction and expel blood clots. Give ergometrine 1ml. Keep all pads and linen to assess blood volume. The doctor may order an ultrasound to rule out any retained products of conception. The result will determine whether the mother will be prepared for exploration under general anaesthetic or treated conservatively with antibiotic and oral ergometrine.

Haemoglobin is estimated before discharge. If it is below 9g/dl, the option of iron replacement is discussed with the mother. The severity of anaemia determines the appropriate care with foods rich in iron or iron supplements. In severe cases the mother is transfused.

Ruptured Uterus

This is a serious complication, which should not occur in today's obstetric care where there is good prenatal and intra partum care.

The rupture of the uterus is a tear in the wall of the uterus. This tear is divided into two categories.

Complete or Intra Peritoneal

This is a tear in the wall of the uterus, which involves the endometrium, myometrium and perimetrium/peritoneum.

Incomplete or Extra Peritoneal

This is the tearing of the uterus, which involves the endometrium and myometrium. Tears can occur parentally, during labour or delivery and may endanger the lives of both mother and foetus.

Can you think of the predisposing factors that may lead to ruptured uterus?

The factors that may lead to ruptured uterus

Predisposing factors include those that contribute to over distension of the uterus such as:

- Polyhydramnious and multiple pregnancy
- Pregnancy occurring within six months post Caesarean section with the placenta situated on the scar
- Obstetric manipulation or operations such as during internal cephalic version
- Previous operation of the uterus
- Foetal pelvic disproportion
- Myomectomy

Signs of ruptured uterus include:

- Rupture may be gradual with bleeding
- Pain and tenderness at the central region are present when the rupture is incomplete
- Diagnosis is difficult; therefore close monitoring is very important.

The Causes of Ruptured Uterus

Prenatally, a ruptured uterus may occur due to a weak scar. During labour and delivery or when not in labour a ruptured uterus may occur as a result of:

- Obstructed labour, for example in malpresentation, cephalopelvic disproportion, contracted pelvis
- Excessive or injudicious use of oxytocin
- Intrauterine manipulation, for example, internal cephalic version of second twin
- Forceps delivery and vacuum extraction
- Shirodkar stitch in labour
- Rigid cervix
- Breech delivery
- Multiparity, due to the degeneration of the uterine muscle
- Previous scar
- Manual removal of placenta
- Perforation of uterus

During labour a classical scar is more likely to rupture than the lower segment scar.

Early Signs of Scar Rupture
Early signs of scar rupture include a constant lower abnormal pain. This pain worsens during a contraction. There is fresh bleeding, which may be mistaken for show. Contractions may continue but the cervical os fails to dilate. Pulse rate is raised due to shock and tends to increase slowly.
Vigilant observation is required for a mother with a uterine scar showing the above signs so that she can be sectioned before rupture occurs.
Epidural analgesia masks the early signs, and is therefore contraindicated in the mother with a caesarean scar. In the advanced stage, the mother complains of severe and drastic pain, which is continuous and does not correspond to the uterine action. When the scar rupture contraction ceases, the mother rapidly becomes shocked. Rupture through a scar has less chance of infection than a rupture due to obstructed labour.
The presenting part does not descend to the pelvic brim in spite of strong contraction. The cervical os dilates slowly and hangs loosely like an empty sleeve and the membranes rupture early or the bag of water is elongated like a sausage.

The Late Signs of Scar Rupture
The following are some of the late signs associated with scar rupture:

- Mother is dehydrated, shows ketosis and is in severe pain
- Rapid pulse and pyrexia of over 38℃
- Poor urinary output, concentrated with ketosis and often blood stained
- Uterus gets moulded round the foetus
- Strong uterine contraction, which does not relax between contractions
- A Bundle's ring
- On vaginal examination, the vagina is hot and dry
- Presenting part is high, wedged and immovable
- There is over lapping of foetal bones and big caput succedaneum
- The mother is exhausted before the rupture, and she will probably cry out during the rupture and complain of a sharp pain in the lower abdomen
- She feels something has given way and soon presents with shock

Rupture Secondary to Manipulation
The general condition of the mother will change, and this could be discovered when the hand is still in the uterus. After any difficult manipulation, the uterus must be explored to rule out injury or rupture. Caesarean section is preferred to difficult manipulation.
Rupture Secondary to Oxytocic Drugs

This is common when close monitoring is not done. There is less danger when these drugs are used as a dilute in an intravenous drip. The risk is much greater in multipara where many cases of rupture have followed unmonitored use of oxytocic drugs.

Write down all that you can think of in the management of ruptured uterus.
The management of a ruptured uterus

- Combat shock by putting up an intravenous drip of saline and elevate foot of the bed
- Inform the doctor or theatre staff to prepare for an emergency caesarean section
- Prepare the mother physically and psychologically for theatre
- Take blood for grouping and cross matching

The options to perform a hysterectomy or to repair the rupture depend on the extent of the trauma and the mother's condition. A hysterectomy is done if the rupture is beyond repair. If the rupture is repaired, you should stress to the mother the importance of not conceiving until at least a year after the operation. Emphasise that she should always deliver by caesarean section and there should be no trial of labour whatsoever.

Post operative care should be followed as in the case of caesarean section.
Can you think of all the complications that may occur?

There are several complications of ruptured uterus to the mother. These include:

- Paralytic ileus
- Peritonitis
- Septicaemia
- Urinary tract infection
- Renal failure
- Death

The foetus may experience complications such as birth asphyxia, stillbirths in complete rupture and neonatal death.

Prevention of Uterus Ruptur

Prevention is possible through good antenatal care after a thorough history taking. Refer high risk patients with previous scars and contracted pelvis for assessment. Vigilant observations in labour, especially in trial and induction of labour are necessary. You should be able to recognise, at an early stage, signs of obstructed labour and ruptured uterus. Maternal education is important in case of risk factors such as a previous scar. The community should be educated on pregnancy and childbirth complications. They should be advised on the need to deliver in a hospital rather than at home.

Shoulder Dystocia

Shoulder dystocia is said to have occurred when there is:

- Failure of the shoulder to rotate spontaneously into anterior, posterior diameter of the pelvis outlet after delivery of the head

Predisposing factors include unusually large infants, foetal anomalies, post term pregnancy, maternal age of over 35 years and high parity.You should watch out for the following warning signs:

- There is slow advance of the head and failure of the head to rotate externally following restitution
- Slow crowning of the head
- There are difficulties in extension of the face during delivery of the head
- There is slow restitution of the occiput to the lateral position

Management of Shoulder Dystocia

You should take the following steps as part of the process of management:

- Explain the situation to the mother and reassure her.
- Position the mother either left lateral with buttocks at the edge of the bed or lithotomy with buttocks slightly beyond the edge.
- Ask your assistant to summon the doctor.
- If the shoulder is caught on the pubic bone the rotation will fail.
- Your assistant should try to dislodge the shoulder. They push the anterior shoulder abdominally towards the middle line, while at the same time you attempt to pull the same shoulder forwards vaginally.
- Simultaneously apply traction to the head on downward, backward direction.
- When you have managed to bring down the anterior shoulder, rotate and deliver it.

Change of the Maternal Position to Help Release the Foetal Shoulders

McRober's manoeuvre is a useful position. The mother is asked and helped to lie flat on her back and bring her knees as far as possible up to the chest. This manoeuvre has been proved to rotate the symphysis pubic angle posteriorly. The midwife creates pressure gently at the mother's legs and her abdomen. The impact of the anterior shoulder is released by this pressure.

Supra Pubic Pressure

Make an episiotomy to enlarge the outlet and reduce pressure at the pelvic floor.

While you exert traction to the head downwards and backwards, hook the fingers into anterior axilla and rotate its shoulder forwards. When the shoulders are in anterior posterior, conduct the delivery as usual.

Rubin's Manoeuvre

Identify the posterior shoulder on vaginal examination. Insert two fingers and push the posterior shoulder in the direction of the foetus chest. If the anterior shoulder dislodges, rotate it away from the symphysis pubic and deliver the anterior shoulder.

Zavanelli Manoeuvre

This manoeuvre is done as a last option to save the life of the baby. The obstetrician reinserts the head into the vagina by reversing the mechanism and caesarean section is done immediately.

Advise the mother on the proper diet to prevent big babies. A proper assessment of the baby's size at 36 weeks by the doctor should enable you to decide the proper mode of delivery.

There are several complications associated with shoulder dystocia.

- Two thirds of the patients will have blood loss of more than 1,000mls
- Maternal death may result from uterine rupture
- Neonatal asphyxia
- Brachial plexus injury
- Neonatal morbidity may be as high as 42%

Amniotic Fluid Embolism

This is a very rare catastrophic condition. Amniotic fluid embolism can occur at any gestation but it is most common at the end of the first stage of labour. The amniotic fluid enters the maternal circulation through the uteri-placental site. An emboli is formed which obstructs one of the pulmonary arteries or alveolar capillaries. It is associated with strong contractions, the membranes having ruptured. The body responds into two phases.
In the initial phase, the pulmonary artery goes into vaso spasm causing hypoxia. In the second phase, there is left ventricular failure, haemorrhage, and blood coagulation disorders followed by pulmonary oedema.

Can you think of what the predisposing factor and signs and symptoms are?

Predisposing factors include:

- Hypertonic uterine action
- Placenta abruptio, where the barrier between maternal circulation and amniotic sack is breached and the placenta bed is disrupted
- Procedures like insertion of intrauterine catheter
- Rupture of membranes
- Caesarean section
- Inter-uterine manipulation, for example, podalic version

Signs and symptoms of the condition are as follows:

- Onset of sudden maternal respiratory distress
- Severe dyspnoea
- Cyanosis
- Hypotension

The mother may get convulsions and collapse immediately after.

Management of Amniotic Fluid Embolism

The following procedures should be followed when trying to manage the condition:

- Administer oxygen
- Commence resuscitation at once
- Give aminophyllin slowly to reduce bronchial spasm
- Give fresh blood or fibrinogen to combat hypofibrinogen anaemia
- Maintain an intake and output chart checking on urinary output
- Assist delivery

In most cases the prognosis is poor.

The mother should be transferred to the intensive care unit.
You should always remember that there are several complications associated with the condition and you should be on the look out for them. These include disseminated intravascular coagulation, haemorrhage before amniotic fluid embolism and acute renal failure. Also note that perinatal mortality and morbidity are high if amniotic fluid embolism occurs before the birth of the baby.

Acute Inversion of the Uterus

Inversion of the uterus refers to when the uterus has turned inside out.

Classify the three degrees of inversion of the uterus.
Inversion can be classified as follows:

- First degree, where the fundus reaches the internal os.
- Second degree, where the corpus of the uterus is inverted to internal os.
- Third degree, where both the uterus, cervix and vagina are inverted and are visible at the vagina.

Classification of inversions is also based on the time they occur. Acute refers to immediate prolapsed after delivery while the placenta is still attached. Subcute and chronic refer to an inversion, which happens 24 hours later.
Classification of inversions is also based on the time they occur. Acute refers to immediate prolapsed after delivery while the placenta is still attached. Subcute and chronic refer to an inversion, which happens 24 hours later.

The predisposing causes of acute inversion of the uterus:

- Management of third stage of labour
- Combining fundal pressure and cord traction while conducting third stage
- Use of fundal pressure before separation of placenta
- Placenta acreta
- Unknown cause, such as when the prolapse happens spontaneously
- Sudden emptying of the gravid uterus
- Short cord

How can you diagnose acute inversion of the uterus?

How to diagnose acute inversion of the uterus:

- Haemorrhage between 800ml – 1,880ml, which depends on the degree of placenta adherent on the uterine wall
- Shock due to pain, which is caused by the stretching of peritoneal nerves and the ovaries being pulled
- No fundus is palpable abdominally
- If inversion is partial, the fundus will not be visible per vagina
- On vaginal examination a mass may be felt

The faster the inversion is reversed, the less the risk to the mother. Remember that in an emergency you need effective teamwork. The more medical personnel, the quicker the work is done.

Management of Uterus Inversion

Inform the mother what has happened and reassure her. Call for help from other midwives.

Give instructions as follows:

- One of your assistants should call the doctor
- The other assistant should elevate the foot of the bed and give pethidine 100gm to relieve pain
- The assistant should then fix a canular, remove blood for cross match and fix an infusion

You should then use Johnson's manoeuvre. Try to push the fundus using the palm of your hand. Direct the fundus to the vagina and towards the posterior fornix. Lift the uterus towards the membranes with steady pressure and return to position. Once the uterus is in position, instruct your assistant to give 0.5gm oxitocin while you hold the uterus until you feel a hard contraction. Then the placenta can be delivered by using control cord traction. If the doctor comes before you finish the procedure, they can take over. In a health centre you should refer the mother to the hospital if you succeed, for further management.

Insert a giving set into the vagina. Use one hand to seal the vaginal orifice. Your assistant should instil a warm saline through the giving set. After pouring several litres the pressure will build up in the vagina. This pressure will restore the normal position of the uterus.

Medical Management of Inverted Uterus

If inversion is not possible manually, it may be due to a cervical constriction ring. The doctor will prescribe a relaxant to relax the cervical os and facilitate the replacement of the inversion.

Hypovalaemic Shock

You have come across haemorrhaging in the previous topic. Haemorrhaging is one of the main contributors to shock. You will now look at how bleeding causes shock.

Shock

Shock refers to the collapse of the circulation system, which results in the reduction of blood flow to the tissue. This causes dysfunction of organs and cells. In obstetric shock, the condition may be due to complications of pregnancy and labour.

Shock can be divided into three categories; can you think what these are?

Three types of shock

- Hypovolaemic, which is as a result of reduction in intravascular volume.
- Cardiogenic, which is due to the inability of the heart to pump blood.
- Distribute, which results from a malfunction in the vascular system causing maldistribution of the circulatory systems. This can be caused by septic and anaphylactic shock.

There are several causes of obstetric shock.

The causes of obstetric shock

- Haemorrhage during pregnancy, labour and puerperium
- Obstetric trauma such as difficult instrumental delivery, forcible breech extraction, manual removal of placenta or caesarean section
- Prolonged labour
- Fluid loss, for instance, excessive diuresis or hyperemesis gravidarum
- Supine hypotensive syndrome
- Pulmonary embolism, which may dislodge and cause oxygen deprivation
- Reaction due to blood transfusion or drugs

The condition develops in several stages, which you will now study in detail.

The Initial Stage

The venous return to the heart is decreased due to reduction of blood or fluid. There is also a reduction in stroke volume and cardiac output caused by inadequately filled ventricles of the heart. There is a fall in blood pressure, which decreases oxygen supply to the tissue and affects the function of the cells.

Compensatory Stage

At this stage the body can compensate for up to 10% of fluid volume. When it reaches 20-28% it begins to fall. The sympathetic nervous system responds to a drop in cardiac output by constricting vessels in the gastro-intestinal tract, kidney, skin and lungs. This causes the skin to be pale and cool. Peristalsis slows, urinary output is poor and gas exchange in the lungs is impaired. This causes ischaemia and collapse of alveoli, ultimately leading to respiratory failure known as ‘adult respiratory distress syndrome’. Blood is distributed to the vital organs only.

There is an increased heart rate in an effort to improve cardiac output and blood pressure. The pupils dilate and the sweat glands are stimulated causing the skin to be moist and clammy. Adrenaline and aldosterone from the adrenal medulla and adrenal cortex are released. The posterior pituitary lobe also produces an antidiuretic hormone, which causes vasoconstriction in an attempt to improve cardiac output. Venous return to the heart increases but cannot be sustained for long unless fluid loss is replaced.

Looking at this mechanism you will notice how important it is to replace the lost fluid.

Hypovolaemic Stage

When the compensatory mechanism begins to fail, there is a further fall in cardiac output and blood pressure. Vital organs lack perfusion and coronary arteries lack supply. There is poor peripheral circulation. The pulse is either weak or absent. In the brain, the level of consciousness deteriorates and the mother becomes
increasingly unresponsive.

The renal tubules become ischaemic, leading to kidney failure. Waste products such as urea and creatinine are not excreted, resulting in their increased presence in the blood. The gut's function as barrier fails due to ischaemia and gram-negative bacteria are able to enter the blood stream.

The liver can no longer metabolise drugs and hormones. As the bilirubin can no longer be conjugated, it builds up and jaundice develops. With the liver failing to act as a filter, there is a build up of lactic acid and ammonia in the blood due to the failure of waste metabolism. Liver enzymes are released in the blood circulation by dead hepatic cells.

Final Irreversible Stage of Shock

The distractions of the cells are irreparable causing multisystem failure and ultimately death.

Outcome of Shock

Early arrest of the cause and replacement of body fluid will give full recovery.

At times the mother may survive but develop permanent damage to various organs. This is referred to as Sheehan’s syndrome. Death is usually due to a delay in treatment.

Management of Hypovolaemic Shock

Urgent resuscitation measures should be applied to prevent irreversible damage to the patient.

The first thing you should do is to maintain a clear airway by turning her on one side. If she is unconscious, insert an airway by turning her on one side and administer oxygen, 40% at the rate of four to six litres.

Find the source of bleeding, whenever possible and try to stop the bleeding. Replace fluid immediately. Take blood for a cross match and give blood transfusion as and when ready. Meanwhile a plasma expander such as dextran,

haemocel or glucose saline (1 litre) should be administered as soon as possible.

When the blood is ready, the first 1,200mls should be given rapidly (within 30 minutes). The doctor should remain with the patient during this exercise. Avoid excessive warmth as it will interfere with the constriction of the peripheral blood vessels, which usually occurs in response to shock.

Remember:
Constriction of blood vessels improves cardiac output and blood pressure.

Elevate the foot of the bed by 30cm. This will raise blood pressure 10mm Hg by gravity. This allows the blood to flow to vital centres in the brain.
Hydrocortisone 100-500mg is given slowly in cases of suparenal failure. A sedative may be necessary in the case of restlessness to calm an apprehensive patient.

Observations
The following observations should be made while monitoring the patient:

- Assess level of consciousness, noting signs of restlessness or confusion
- Monitor blood pressure continuously, about every 15-30 minutes
- Cardiac rhythm needs to be monitored continuously
- Measure urine output hourly by the use of indwelling catheter
- Take hourly temperature and observe the colour of the skin. Improvement to normal body temperature and colour may mean the function of the organs is going back to normal. Persistence of subnormal temperature means the reverse
- The infusion quantity and rate should be maintained accurately by measuring haemodynamic pressure in the right atrium
- Observe further occurrence of bleeding

Septic Shock

This is also known as endotoxic or bactereamic shock. The main cause of septic shock is gram-negative organism such as Escherichia coli, Bacillus Proteus or Pseudomonas pyocyaneus. These organisms are commonly pathogenic in the female genital tract. Gram-positive bacteria, viral or fungal infection, do not commonly cause septic shock. In 20-30% of cases, the cause of infection is combined organisms, and treatment becomes complex.
Can you think what the causes of septic shock are?

Septic Shock

Septic shock can be caused by prolonged rupture of membranes and puerperal sepsis, especially in cases of caesarean section.
The primary response of the body to septic shock is the release of histamine and enzymes produced by damaged cells. This contributes to an increase in the permeability of capillaries and vasodilatation. Mediators of opposite action are also produced causing vasoconstriction. Vasodilatation is the overall response and causes the reduction of the systemic vascular resistance. Cardiac output remains elevated during this first phase of vasodilatation. The mother's face is flushed, her skin is warm and moist. Temperature ranges between 38 and 41℃. Systolic blood pressure is less than 90mm Hg.
In the second or late phase of vasoconstriction, there is cold hypotension. The continuity of hypotension and vasodilatation causes damage to the kidneys with reduced glomerular filtration due to the constriction of lobules and acute tubular necrosis followed by oliguria.
Adult respiratory syndrome is present in many cases. Haemorrhage occurs due to disseminated intravascular depression, which results in multisystem organ failure. There is mental confusion, coma and cardiac failure, which result in death.
Identify the source of infection by taking specimens including high vaginal swab, multistream urine and blood cultures. Check the infusion site and indwelling catheter for signs of contamination and change where appropriate.

Drug Therapy for Septic Shock

Use quick fluid therapy including glucose, saline, rigers, lactate or whole. An injection of dopamine, 20mg per kilogram, is infused in the vasodilation stage. Hydrocortisone is given, 100mgs IV stat, followed by 100mg six hourly until the pulse and blood pressure are stabilised.

Antibiotics are commenced immediately after the specimens for culture and other investigations are completed. These include:

- Gentamycin 80mg IV eight hourly
- Metronidazole 500mg IV eight hourly
- Ampicillin 500mg IV six hourly
- These should be administered until the bowel sound returns. You should then continue with 400mg metronidazole orally eight hourly for 10 days.

UNIT FOUR: CONTRACEPTIVE TECHNOLOGY

In this unit you will study the principles of contraceptive technology and will cover all methods of family planning, both natural and modern.
This unit is composed of four sections:
Section One: Current Contraceptive Principles
Section Two: Natural Family Planning and Lactation Amenorrhoea
Section Three: Hormonal Contraceptives
Section Four: Other Contraceptive Methods

Unit Objectives

By the end of this unit you will be able to:

- List the principles used in current contraceptive technology
- Explain the physiology of natural family planning and lactation amenorrhoea
- Describe the different types of hormonal contraceptives
- Describe non-hormonal types of contraceptives, which include IUCDs, VSC and barrier methods

SECTION 1: CURRENT CONTRACEPTIVE PRINCIPLES

Introduction

In this section you are going to be introduced to the principles currently used in contraceptive technology. You will occasionally be referred to module one, and the section on counselling and infection prevention. You will also review module two unit one section one, which discusses the policy guidelines and standards on Reproductive Health (RH), and section four, which deals with safe motherhood.

Objectives

By the end of this section you will be able to:

- Define family planning (FP)
- List the benefits of family planning
- State the guidelines and standards of family planning/reproductive health
- Explain counselling in relation to family planning
- State the patient assessment prior to family planning

Family Planning

What is Family Planning?

What do you think family planning is?
Did you think of this?
Family planning is the process of child spacing so that the couple has the number of children they want at the time desired, that is, when wanted, expected and welcomed.

Refer to unit one for further details and clarification.

Benefits of Family Planning
Family planning enables couples and individuals to decide freely and responsibly on the number and spacing of their children, as well as on the most appropriate time of having them.
Family planning helps everyone. The health benefits of FP play a major role in protecting and promoting the quality of lives, not only of the infants but of their siblings and the family as a whole.

Can you think of three benefits of family planning?
There are several benefits of family planning.

Medical Benefits
Medical benefits differ depending on the target population. Some of the benefits of family planning for women are shown below.

- Their health is better as they are protected against unwanted pregnancy, hence death related to high risk pregnancy and abortion is reduced.
- Some methods, such as the hormonal method, have additional (non-contraceptive) benefits, including the reduction of anaemia and cancer of the genital tract.
- Barrier methods minimise the transmission of STIs and HIV/AIDS if used properly.
- Mothers become healthier as they avoid the extremes of maternal age and carry their pregnancies within the optimal child bearing age bracket of 19 to 35 years, before and after which the mothers are at high risk of developing complications related to pregnancy.
- There is a decrease in the risks of abortion as the baby is welcome and the

mother well prepared physically and psychologically for the pregnancy.
- There are reduced fertility and mortality rates.
- There are improved health facilities and death related to pregnancy and childbirth is reduced.

There are also medical advantages to the children.

- Children are healthier, since the optimum spacing between births is 27 to 38 months, giving the mother the time to nurse and care for the infant.
- The death related to infections and malnutrition to the under fives is reduced.

Social Benefits

The social benefits related to family planning are numerous.

- There is an improved relationship with the spouse and family due to less stress and better social life.
- Socially healthy families are productive and economically more stable as they participate in community development and nation building.
- Women learn to make informed choices.

National Benefits

There are several benefits associated with family planning on a national level.

- The country is able to budget for its citizens as the birth rate will be controlled.
- Nationally reduced fertility and mortality rates lessen the burden to the nation.

You should note that countries with high fertility rates have poor health conditions in general, and inadequate health facilities substantially increase the risk of pregnancy related deaths. *(Hatcher: July1997)*

Scope of Family Planning

You will now cover the steps that help the health provider in the provision of FP.

Counselling

Family planning service providers should be competent in counselling on topics related to all FP methods.

Provision of Contraceptives

You should provide contraceptives to patients in accordance with the suitable method chosen by the patient.

Follow Up and Referral System

All patients who choose a method of FP should be informed of the appropriate follow up requirements and encouraged to return to the clinic in case of any concerns. Providers should use the established referral system for appropriate management of identified conditions that need further attention.

Record Keeping

The service provider should keep proper records of each patient. Keep up to date records on contraceptive distribution as well. All service delivery points (SDPs), NGOs and other stakeholders should follow the Ministry of Health Guidelines on Service Provision and Record Keeping. This helps in compiling statistical data for health care planning.

Supervision

Supervision is an essential component of program evaluation. It ensures that the guidelines are being followed and patient needs are being met. It helps in the assessment of the quality of care given and whether the patient's rights are being observed. Furthermore, it motivates service providers as they can express and discuss views with their superiors. Continued supervision will enable you to pinpoint areas for improvement.

Logistics

The main objective of logistics management is to deliver the right product in the right quantity, in the
right condition, to the right place, at the right time for
the right cost.

Proper maintenance of a logistics system helps the providers to avoid both understocking and overstocking in order to maintain quality. The service provider must ensure proper storage and handling of contraceptive commodities for the stipulated shelf life. The contraceptives are removed from the shelf systematically (that is, first in first out) thereby ensuring those nearing expiry are used first.

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Counselling in Family Planning

Do you remember the definition of counselling as covered in module one?
Counselling is the act of working with a patient to help them clarify personal goals and find ways of overcoming their problems with the aim of assisting the individual to change behaviours that are interfering with attainment of basic needs.

For the purpose of FP, counselling is viewed as the
art whereby the service provider guides/assists a
patient to make an informed choice in matters regarding their RH needs, taking into account all the surrounding circumstances and the patient's personal needs at the time.

Counselling is a vital part of RH care. It helps patients to:

- Arrive at an informed choice of RH options
- Select a contraceptive method with which they are satisfied
- Use the chosen method safely and effectively

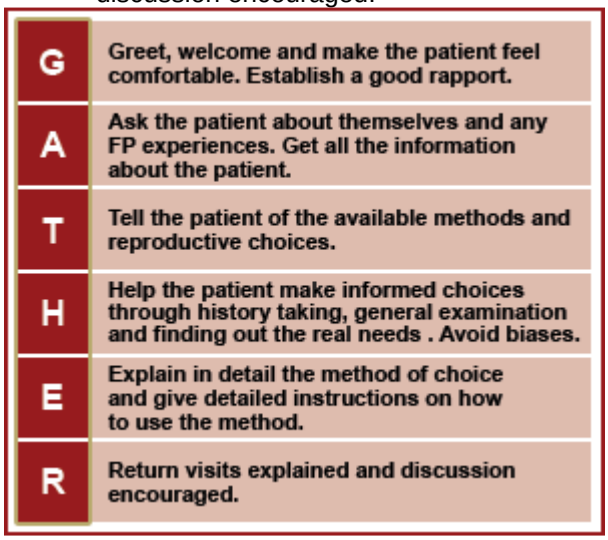
Counselling in family planning is an important tool when serving patients. It is important to remember that they have:

- The right to decide whether or not to practise FP
- The freedom to choose which method to use
- The right of privacy and confidentiality
- The right to refuse any type of examination

While many contraceptive methods are highly effective, method failure can occur. In case of method failure, the patient should be counselled, informed about available options and referred for appropriate services.

Steps in Counselling a Patient for Family Planning
There are six steps used in counselling a family planning patient.
Can you remember what they are?

- Greet, welcome and make the client feel comfortable. Establish a good rapport.
- Ask the patient about themselves and any
  FP experiences. Get all the information about the patient.
- Tell patient of the available methods and reproductive choices.
- Help the patient make informed choices through history taking, general examination and finding out the real needs.
  Avoid biases.
- Explain in detail the method of choice and give detailed instructions on how to use the method.
- Return visits explained and discussion encouraged.



The Counselling Process
As a service provider, you need to review all available contraceptive methods that your patient may choose from. As a counsellor, you should be aware of a number of factors about each patient that may be important, depending on the method to be used. These are:

- The reproductive goal of the woman or couple (spacing or timing of births)
- Personal factors including the time, travel costs, pain or discomfort likely to be experienced

- Accessibility and availability of other products that are necessary to use the method
- The need for protection against STIs and HIV/AIDS

There are three phases of counselling.

Initial Counselling
Initial counselling is carried out at reception, where
you have to describe all the methods available and
help the patient to choose the method appropriate
for themselves.

Method Specific Counselling
Method specific counselling is carried out prior to
and immediately following service provision. Here,
you need to give instructions to the patient on how
to use the method chosen. You should also discuss
possible common side effects specific to the method
and explain what should be done if that happens.

Follow up counseling

Follow up counselling occurs during the return visit.
Ask the patient about method use, satisfaction and
any problems that may have occurred.

Do you know who should provide counselling?
All the staff should be knowledgeable about all available contraceptive methods so as to be in a position to give information and counsel effectively. *(MOH: March 2005).*

Patient Assessement

The patient assessment will help you to give an appropriate method of contraception to an individual patient. In many ways counselling forms a part of patient assessment since both go together as you assist the patient to make an informed choice about the most appropriate method.

The main objective of carrying out a patient assessment is
to determine:

- That the patient is not pregnant
- Whether any conditions requiring additional care for a particular method exist
- Whether there are any special problems that require further assessment, treatment or regular follow up or referral
- Whether there are need for HIV/AIDs services and, if so, to provide the services or arrange the appropriate referral

To achieve the above objective, you have to be careful with the questions you ask and remain attentive to the patient's concerns. Furthermore, you need to clarify any points that you feel the patient does not understand clearly.
How can you be reasonably sure that a female patient is
not pregnant?

You can only be reasonably sure a patient is not pregnant when she has no signs and symptoms of pregnancy and exhibits the following characteristics:

- Has had no intercourse since her last menses
- Is within seven days after the start of her menses (days one to seven)
- Is within four weeks postpartum (for non-breast feeding women)
- Is within seven days post abortion
- Is fully breast feeding less than six months post partum and has had no menstrual bleeding
- Has been correctly and consistently using another reliable contraceptive method

Pelvic examination is seldom necessary except to rule out pregnancy of more than six weeks, measured from the Last Menstrual Period (LMP).
A pregnancy test is not essential, except in cases where:

- It is difficult to confirm pregnancy (that is, six weeks or less after the LMP)
- The results of pelvic examination are unequivocal (for example, with an overweight patient sizing the uterus may be difficult)

If pregnancy testing is not available, counsel the patient to use a barrier method or abstain from

intercourse until her menses occur or pregnancy is confirmed.

Remember:
1. No contraceptive method with the exception of condoms (and the diaphragm to a lesser degree), provides protection against Genital Tract Infections (GTIs) and other STIs such as Hepatitis B or HIV/AIDS.
2. During the counselling sessions, explain to all patients the risks of GTI and STI transmission.

Most contraceptive methods can be provided after asking a few key questions. However, Intra Uterine Contraceptive Devices (IUCDs) and Voluntary Surgical Contraceptives (VSCs) do require a physical and pelvic examination to be performed before use. This brings us to the examinations that you may have to perform routinely and annually on your patients.
Below are the special procedures a patient may go through to enhance her good reproductive health. These include:

- General physical examination
- Breast examination
- Pelvic examination
- Papanicolau smear

General Physical Examination
What do you think is the purpose of a physical examination?
The main purpose of a physical examination is:

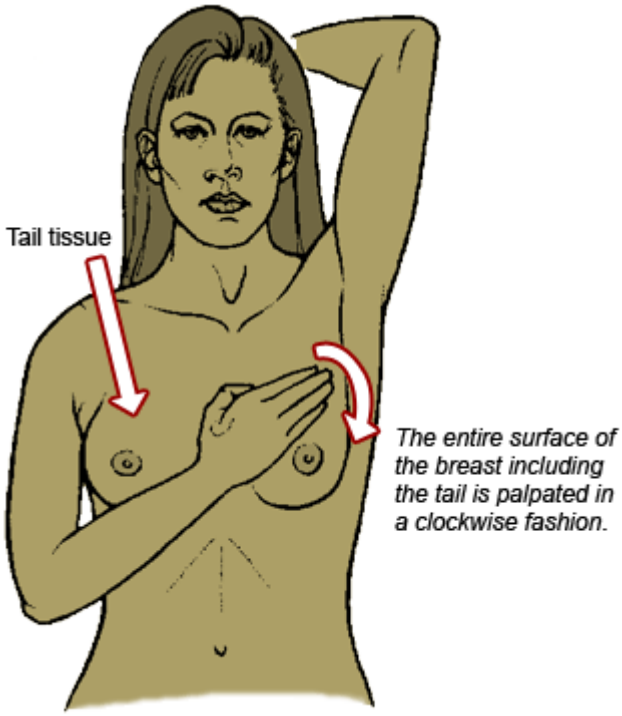
- To assess the general health status of a patient
- To aid in making a diagnosis

A physical examination should be performed either as part of a routine medical examination or in case of sickness. You are expected to carry out a systematic head to toe examination, noting:

- Health status
- Nutritional status
- Behaviour
- Mental state
- Speech
- Ability to walk

You should also check for signs of anaemia, infection, jaundice, hypertension and deep venous thrombosis. (NCK:1988; MOH:1988)

Breast Examination
This is a very important examination for a family planner.
See if you can answer the questions below.



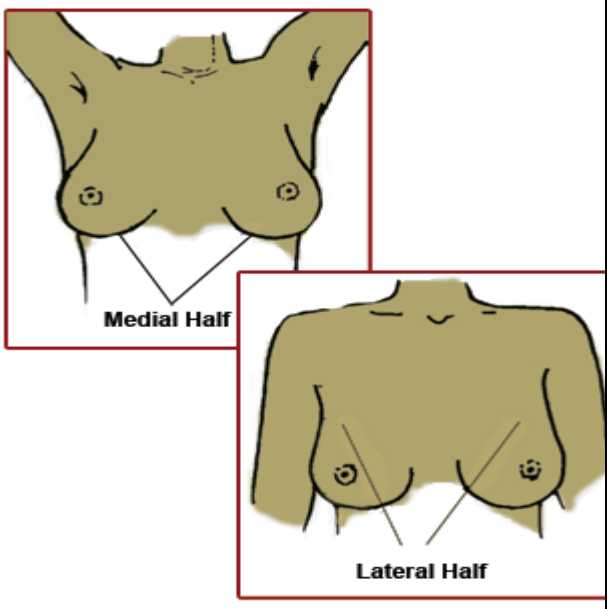
Why should you perform a breast examination?
The main reason for performing a breast examination is to enable you to detect abnormalities (such as cancer of the breast) and take appropriate action.

When should a breast examination be performed?
From the age of 20 years all females should do Self Breast Examination (SBE) immediately after their menstrual period. If the patient is on the pill, she should perform her SBE on the day she starts a new packet. Those in menopause should do a SBE on the first day of each calendar month.

How do you perform a breast examination?
This is the method whereby the patient inspects, palpates and expresses both breasts. The axilla is also palpated for any nodules.

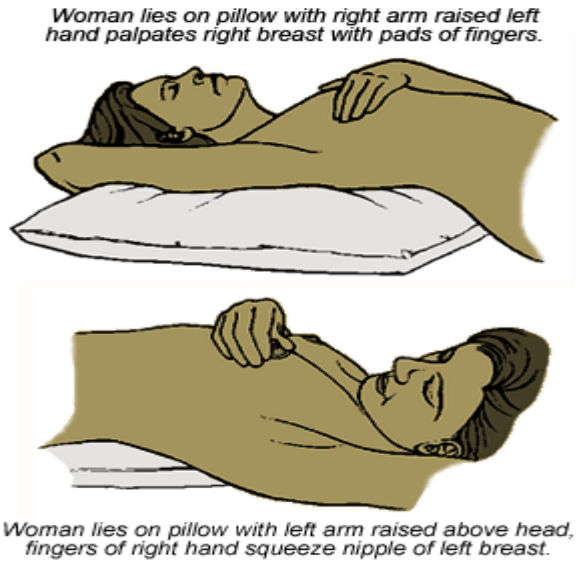
Inspection
Ask the patient to undress and sit or stand relaxed in front of a mirror with good lighting. With hands at the sides, on the waist and on the head respectively, check on the size, shape, discoloration and retraction (dimpling) of the nipple. Turn from side to side and look underneath, push the hands inward and

outwards until the chest muscles tighten. Check again at the breasts while pressing and note any puckering of the skin or retraction of the nipple.



Palpation

Ask the patient to lie down in a dorsal position on a firm surface with her head on a pillow. Tell her to put her left hand on top of the head folded and then use the right hand to examine the left breast. She should then reverse this to examine the right breast. Emphasise that she should examine one breast at a time using the flat of her fingers but not the fingertips. The fingers should be kept flat and close together. Instruct her how to divide the breast into quadrants (four areas), and starting with the upper scale near the collarbone, to press gently but firmly towards the body and going round the whole breast clockwise to check for any lumps. Show her how to examine the tail of the breast by going right up into the hollow of the armpit. Then she should repeat the whole process for the other breast.



Woman lies on pillow with right arm raised left hand palpates right breast with pads of fingers.

Woman lies on pillow with left arm raised above head, fingers of right hand squeeze nipple of left breast.

Expression

Finally, hold the nipples in between your fingers and express to check on unusual secretion, such as blood or pus.

The following are some warning signs to be noted

upon examination:

- Unusual difference in size or shape of the breast
- Alteration in the position of either nipple
- Turning of colour of either nipple
- Dimpling of the surface
- Unusual rash on the breast or nipple
- Unusual prominence of the veins over either breast or a discharge from the nipple
- Unusual discrete lump or nodule on any part of either breast

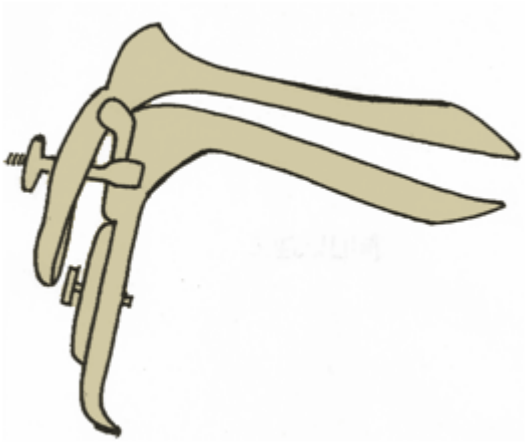
Should you find anything strange, report it to the doctor for further examination, investigation and management.

Pelvic Examination

Pelvic examination involves exploring the female pelvic organs using hands and speculum. The main objectives of pelvic examination are to:

- Detect pelvic abnormalities that may act as a limitation to a specific contraceptive technique,
  such as IUCD, and for diagnosis
- Identify a pathological process that may have
  arisen incidental to, or as a complication of,
  any contraceptive

- Obtain specimen for laboratory studies such as cervical smear for papanicolau, culture for gonorrhoea, culture for sensitivity of any bacteria and/or wet vaginal smear
- Determine uterine position, shape, size, consistency for IUCD insertion and vaginal condition for diaphragm fitting



Aseptic technique has to be observed to ensure quality care is maintained and infection is prevented during the procedure.

Items Required for a Pelvic Examination:

- One cusco speculum
- One kidney dish
- One galipot
- Sterile cotton wool
- Swab
- Investigation form
- Pairs of gloves
- Sanitary pads
- Scraping spatula
- One sponge holding forceps
- Antiseptic
- Lubricant

Speculum Examination

When conducting a speculum examination you should:

- Explain the procedure to the patient
- Let the patient empty her bladder
- Ensure privacy
- Scrub your hands and put on gloves aseptically
- Put the patient in dorsal position on the couch and cover her up to the abdomen
- Inspect external genitalia
- Lubricate the speculum with water
- Insert into the vagina with blades laterally
- Open blades and visualise the cervix then check for discharge, colour or erosion
- Take specimen for laboratory test if indicated
- Unscrew and remove speculum, examine vaginal wall as you remove speculum

Bimanual or Digital Examination

When conducting a digital examination you should:

- Swab the vulva with antiseptic systematically
- Lubricate gloved fingers and insert into the vagina
- Check the state of vagina as well as cystocele and rectocele
- Locate the cervix, cervical OS whether anterior, midpoint or posterior
- Check if position of uterus is anteverted or retroverted
- Palpate adnexae for tenderness
- Check pelvic muscle tone
- As you come out squeeze Skene's glands
- Check on your gloves. If there is blood, which indicates the patient is on menses, give pads
- Make your patient comfortable

Papanicolau Smear

It is advisable for the patient to have a Papanicolau (Pap) smear yearly. A Pap smear consists of scrapings obtained from the cervix for cervical cytology. The purpose of the smear is to detect cancer of the cervix.

The following equipment is necessary to conduct the procedure:

- One cusco speculum
- Two glass slides
- One hard diamond pencil
- One wooden spatula
- One fixative solution
- One pathological request form

- Swabs

There are several points to remember when performing this procedure.

Points to Remember When performing a Papanicolau Smear

1. Clean the slides and label correctly, using the diamond pencil, before taking smears.
2. Fill in the pathological form.
3. Speed is essential to prevent dying of cells.
4. Keep the slide with smear away from direct light.
5. Do not lubricate speculum with antiseptic. Tap water may be used.
6. Do not swab vulva with antiseptics.

Now you have looked through the points to remember, you will look at how the procedure is performed.

Ensure privacy and explain the procedure to the patient. Let her empty the bladder. You should position her on a couch in the dorsal position with the abdomen covered. Insert speculum and after visualising the cervix, screw it into position. With the wooden spatula, scrape the cervical cells by rotating the end of the spatula through 360° in the cervical os.

Quickly spread the sample onto the slide and put a fixative solution or spray to fix it on the slide. Repeat the procedure for the second slide. Allow to dry and ensure that the specimen is taken to the laboratory immediately.

For further information refer to the Nursing Council Procedure Manual, pp. 278 - 279.

Classification of the Pap Smear

Pap smear results are classified in the following manner:

Class I	Normal cells
Class II	Minor infections, for example Moniliasis, Trichomonas
Class III	Suspicious of malignancy. In such case: • Repeat smear in three months • Refer for cone biopsy to confirm presence of cancer cells under a microscope
Class IV	A few cancer cells that can be treated successfully
Class V	Numerous malignant cells indicating definite cancer

Both class IV and V should be referred to the Gynaecology Department urgently for appropriate treatment. (MOH:1988, NCK:1988, MOH:June 1997)

SECTION 2: NATURAL FAMILY PLANNING (NFP) AND LACTATION AMENORRHOEA (LAM)

Introduction

Natural family planning is an approach to the understanding and respecting of human sexuality with its inherent procreative capacity and its consequent responsibility. Any teaching of the natural methods of family planning is, therefore, within the context of strengthening the family bonds and promoting responsible parenthood and its pro-life.

The natural methods are based on simple observance of nature in regard to human fertility. The methods do not interfere with the body functions in any way. The natural family planning methods require the cooperation of both the husband and wife and the study and discussion of their combined fertility brings them closer together. The sacrifice and control they demand generate respect of love and life. Because this is a natural method it overcomes all barriers, such as religious, social or ethnic. NFP goes hand in hand with LAM. As the mother breastfeeds, ovulation is delayed for as long as two years thus reinforcing the relationship and baby care.

Objectives

By the end of the section you will be able to:

- Describe the three types of NFP
- Describe how lactation amenorrhoea functions

Natural Family Planning (Fertility Awareness Based Method)

Natural Family Planning (NFP) is the oldest method of contraception. In our societies most tribes practiced some form of FP, such as when a mother was breast feeding it was a taboo to have sex as it was believed the baby would become sick and even die. The woman would abstain from sex for two to four years after childbirth. On some occasions she would even go back to her family home. Many communities also sanctioned polygamy, which allowed the man to have his sexual desires fulfilled while the mother was breast feeding.

As communities started changing, monogamy was embraced and the couple stayed in one house. As a result, new methods of FP came into existence to complement the NFP method.

Natural family planning refers to a way of life whereby a couple, if properly instructed, can choose to avoid or achieve pregnancy by applying the appropriate sexual behaviour during the fertile and infertile phases of the menstrual cycle without the use of chemicals or mechanical devices. NFP is also referred to as periodic abstinence, rhythm or fertility awareness method.

The NFP method seems to work best when couples are clear about whether they want to have a child or not. The method appeals to couples who feel that fertility control is a joint responsibility and that neither partner should be required to bear the brunt of the health burden.

NFP educates couples on their reproductive processes and human sexuality as they work in harmony to control or regulate their fertility. There are several methods of NFP.

Basal Body Temperature (BBT) Method

This is a natural method of family planning and it involves the woman taking and recording her body temperature every morning before rising to know when ovulation occurs. In a healthy woman the body temperature remains relatively constant during the first phase of her menstrual cycle. Shortly before ovulation the temperature rises by about 0.2℃ to 0.5℃ and stays elevated until the next menstrual period. The couple should avoid sexual intercourse during the period when BBT is high. They can have sex after the third day of consecutive high temperature until the beginning of next menstrual bleeding.

Note the following points when taking basal body temperature:

- It should be taken first thing in the morning before rising
- Temperature should be recorded within same hour
- Note temperatures taken outside the hour
- Note all disturbances, for example, all medications
- Use the same thermometer for the entire cycle
- Note the use of a new thermometer
- If the reading stops between two numbers ignore the high one and record the lower one

In some circumstances the natural family planning method may fail due to individual physiological variations. To be more successful, a woman may have to use a combination of methods, referred to as 'sympto thermal' whereby the woman checks on the mucus as well as the temperature.

The Sympto Thermal Method (which combines the Billings and Basal Body Temperature Methods)

The sympto thermal method combines the recording of Basal Body Temperature (BBT) with observing the cervical mucus and other physical signs of ovulation. These physical signs include:

- Breast tenderness
- Mid cycle pain
- Spotting or bleeding
- Abnormal heaviness
- Cervical changes on position, degree of opening and texture, slippery and stretchy mucus

The couple should abstain from sexual intercourse from the first appearance of the sensation of cervical mucus until after ovulation has been confirmed by three days of elevated temperature or four days of post ovulation mucus.

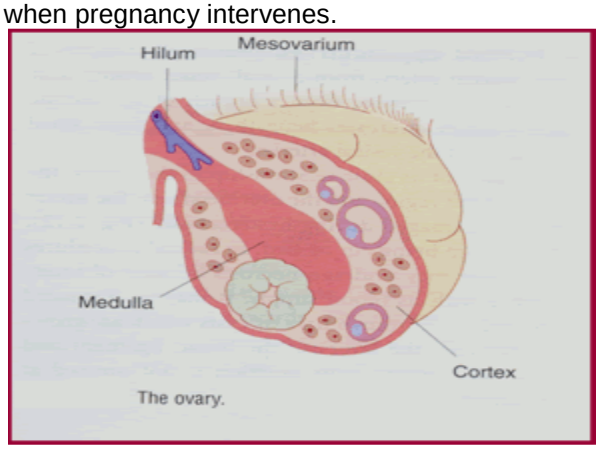
Billings Ovulatory Method (BOM) or Cervical Mucus Method

This method is based on the ability to recognise fertile and infertile phases of the menstrual cycle. It requires a high level of motivation and cooperation from both partners. The woman needs to become aware of mucus changes and abstain from sexual intercourse to avoid pregnancy during the fertile period.

In the beginning, a daily record on the type of mucus is important until the patient becomes confident. This takes about one year. In order for you to understand and instruct patients to follow the Billings method you need to review the menstrual cycle.

The Menstrual Cycle

Failure of fertilisation results in menstruation. This discharge is shed from the endometrium. It consists not only of blood but also debris from the uterine wall in the form of mucus and fragments.
The menstrual cycle is defined as a series of physiological changes directly related to the development, regression and shedding of the endometrium under various hormonal influences.
The monthly cycle begins with the first day of bleeding and ends with the day before the next cycle begins. It varies in length but the average cycle is taken to be 28 days and reoccurs regularly from puberty to menopause, except when pregnancy intervenes.



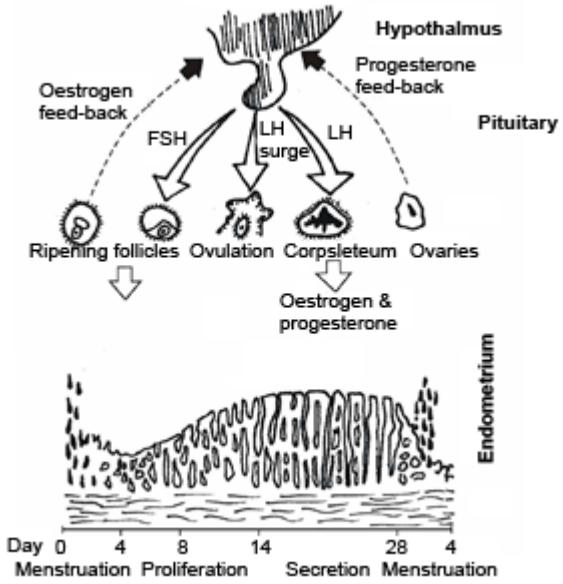
There are three main phases and they affect the tissue structure of the endometrium controlled by ovarian hormones.

Can you list the three phases of the menstrual cycle?
Did you remember the phases?
The three phases of the menstrual cycle are menses, proliferative and secretory. If you did not remember them, please go over module two unit two part one to refresh your memory.
You will now look at the phases step by step.
There are three main phases and they affect the tissue structure of the endometrium controlled by ovarian hormones.

Menstrual Phase
During the menstrual phase there is vaginal bleeding lasting three to five days. It is the terminal phase of the cycle when the endometrium is shed down to the basal layer along with blood from the capillaries and the unfertilised ovum.

Proliferative Phase
The proliferative phase follows menstruation and lasts up to ovulation. This phase is under the influence of oestrogen. There is growth and thickening of the endometrium in readiness to receive the fertilised ovum.

Secretory Phase
This is the last stage and follows ovulation. It is also known as the luteal phase. It occurs under the influence of the progesterone hormone and oestrogen from corpus luteum. The endometrium
thickens and becomes spongy and the glands are more tortuous. If fertilisation does not occur, the ovum dies, the secretion of progesterone and oestrogen falls and the endometrium breaks, shedding blood as menstruation. *(Bennett, et al: 1999)*



Changes Occurring During the Menstrual Cycle
You should be aware of the following changes, which occur during the menstrual cycle:

- The human gonadotrophic hormone stimulates the ovaries to produce oestrogen and progesterone. At the same time, several ova begin to grow.

- As the ova are growing, the Graafian follicle surrounding the ova begins to produce high levels of oestrogen. Oestrogen causes several changes to occur during the fertile period.
- Cervical mucus becomes profuse, slippery, stretchy and wet, raw egg white or clear and lubricative.
- The vaginal secretions are also wet.
- The cervix rises, softens, and opens to help the sperm travel into the uterus.
- The basal body temperature is low.
- The uterine lining increases in thickness and blood supply.

The mucus performs several functions. These include:

- Protecting the sperm cells so that they retain their fertilising capacity for three days
- Nourishing the sperm
- May make the sperm cells capable of fertilisation
- Filtering and destroying damaged sperm cells
- Helping in sperm mobility as it forms guiding channels which help the sperm to move along the vagina through the cervix, uterus and into the fallopian tubes

Ovulation occurs on the 14th day before the beginning of the next period. Once the ovum is released, it can only be fertilised within 24 hours. After ovulation, the hormone progesterone is produced and it enhances changes in the female reproductive system.

The infertile period is characterised by the following changes:

- The cervical mucus loses its quality (it feels dry and is no longer slippery and stretchy). It becomes milky, sticky, scanty, and thick and hinders sperm penetration into the uterus.
- The cervix lowers down and becomes firm and closes passage for sperm to the uterus.
- The basal temperature rises and remains the same for the rest of the cycle.

If there is no fertilisation, the levels of oestrogen and progesterone fall and menstruation occurs around 12 to 14 days after ovulation.

The Billings method of contraception is applicable to all phases of a woman's reproductive life whether her menstrual cycles are regular or irregular, during adolescence, when she is coming off the pill, when she is breast feeding, or approaching the menopause.*(CDC: 1999, Hatcher et al: 1997)*

Mechanism of Action for the Fertility Awareness Method

This method is based on the awareness of two major facts:

- A man's sperm can live in a woman's reproductive tract for three days.
- The woman's ovum can be fertilised on the day of ovulation and a day after.

This calls for the couple to be able to estimate at least four to five days in advance when the woman will ovulate. If they can identify when ovulation has occurred, they can then adjust their sexual practices depending on whether they want a pregnancy or not.

There are both advantages and disadvantages to NFP.

Advantages

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Disadvantages

The disadvantages of this method include:

- For the cervical mucus and sympto thermal methods to be used correctly, the couple requires at least three cycles to be confident. This necessitates constant contact with the instructor.
- Both partners have to be committed, motivated and cooperative for success. Where abstinence is required, male participation has been wanting.
- It is less effective due to user errors.
- It can cause emotional stress when the couple have to abstain for several days.
- It does not protect against STI/HIV/AIDS.
- It requires systematic charting.

Remember:

Despite the disadvantages, this method is very effective so long as the couple are cooperative and understand their responsibilities.

Lactational Amenorrhoea (LAM) in Family Planning

Lactational Amenorrhoea is a family planning method based on the physiology of breast feeding. LAM involves the use of breast feeding as a temporary family planning method.

Breast feeding has the effect of stopping ovulation because it changes the rate of natural hormones for at least six months or longer. The mother is encouraged to start another method at the proper time. LAM has several advantages, which range from contraceptive to non-contraceptive.

Contraceptive advantages:

- Protection against pregnancy as long as full breast feeding is practised
- No interference with sexual activity

Non-contraceptive advantages:

- It can be used immediately after birth
- No cost or supplies needed
- It contributes to passive immunity for the child
- It decreases exposure to pathogens in water and other milk
- It incorporates the best source of nutrition to infants

However, LAM does have one major limitation in that it is effective only when the mother is breast feeding for at least six months.

The LAM method is most suitable for mothers with babies less than six months of age and who are still amenorrhoeic. In addition:

- The baby is fully breasting feeding, that is, 85% of feed is breast milk
- The mother breast feeds often, both day and night
- Baby feeds on demand
- The mother's menstrual periods have not resumed
- Baby not more than six months old

Remember:

Pregnancy is possible with this method, so mothers should look for other effective methods as soon as possible.

SECTION 3: HORMONAL CONTRACEPTIVES

Introduction

In this section you will focus on synthetic hormonal contraceptives, which are like the natural hormones. When used effectively, these will

hinder pregnancy.

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Hormonal Contraceptives

Can you think of four types of hormonal contraceptives you have seen in your health facility?

Have you listed:

- Combined oral contraceptives
- Injectables
- Implant
- Progestin only pills

You will now continue to cover each of them in greater detail.

Combined Oral Contraceptives (COCs)

Combined Oral Contraceptives (COCs) are made up of a combination of synthetic oestrogen and progesterone. The monophasic, which include microgynon, neogynon, eugynon and nordette, have a high level of oestrogen. Triphasics,

including logynon and trinordial, have low oestrogen content

and are preferred for teenagers and women over 35 years and

those with acne.

COCs act in the following manner:

- Slow down the motility of the fallopian tubes

  delaying implantation
- Delay or inhibit ovulation as the Follicle Stimulation Hormone (FSH) production is suppressed, which inhibits maturation of ovarian follicles
- Mucus is too thick to be penetrated by the sperm
- Endometrium is not well prepared for fertilised ovum due to low oestrogen levels

The Advantages and Disadvantages of Combined Oral Contraceptives

There are several advantages and benefits associated with the use of combined oral contraceptives.

Advantages and Benefits of COCs

- They are highly effective when used correctly
- They are easy to use
- They are effective immediately
- Non-clinical staff can provide them
- A pelvic examination is not required to initiate use

There are also non-contraceptive benefits, which include:

- Reduced menstrual flow, which reduces the risk of anaemia
- Decreased dysmenorrhoea
- Protection against benign cancers of the breast, ovary and endometrium
- Prevention of ectopic pregnancy

However, there are also several limitations, which should be taken into consideration.

Limitations of COCs

- The effect is lowered by other drugs, such as anti-tuberculosis and anti-epileptic drugs
- There can be serious side effects though these are rare (for example, stroke, myocardial infarction, venous thrombosis and adenomas)
- They offer no protection against STIs

Who Can Use Combined Oral Contraceptives?

Combined oral contraceptives can be used by various categories of people.

COCs can be used by:

- Sexually active women of reproductive age
- Women with established menses
- Women of any parity, nulliparous included
- Breast feeding mothers after six months post natal, whose LAM criteria applies
- Women who can follow a daily routine of pill taking
- Women with anaemia
- Women with severe dysmenorrhoea

Who should not use combined oral contraception?

There are some women who are advised not to use combined oral contraceptives.

Women not advised to use COCs include:

- Breast feeding mothers before six months post partum
- Women who are pregnant or suspect they are pregnant
- Women with unexplained abnormal vaginal bleeding
- Women with a history of blood clotting disorders
- Women with a history of heart disease
- Women with active liver disease
- Women who are hypertensive with BP of 160/100 or over
- Women with diabetes mellitus complicated by vascular disease
- Women who smoke and are over 35 years
- Women with sickle cell

When recommending pills to a patient you should make sure that you give them the following instructions and that they fully understand.

- Pills should be taken at about the same time each day preferably at night after meals.
- If one pill is missed it should be taken as soon as it is remembered, even if it means taking two pills the next day.
- If the patient has missed two or more pills in any seven day period she should take the pill at once and continue as usual. However, she should also use condoms or spermicide, or avoid sex for seven days.
- If on a 21 day packet pill, the patient should rest for seven days on completion of a packet, then start the next packet on day eight and continue throughout. If on 28 day packet, the pill should be taken continuously.
- The patient should come to the clinic for a follow up, an annual check up and pap smear.

You should always be on the look out for the following danger signs/serious side effects which need urgent medical attention:

- Abdominal pain
- Chest pain and breathlessness
- Headaches frontal in nature
- Eye disturbance such as blurring or flashes
- Severe calf muscle pain

The above mentioned develop suddenly and are severe in nature. The patient should be advised

to stop taking the pills, use a back up method of contraception and consult the doctor or visit a clinic immediately.

Progestin Only Pills (POPs)

POPs are pills that contain low doses of synthetic progestin. They work in the following manner:

- The cervical mucus is thickened, which impairs penetration by spermatozoa
- POPs inhibits ovulation
- POPs regress endometrium

Can you think of three types of POPs which are available at service delivery points?
Have you listed microlut, micronor and ovrette as the progestin only pills?

There are several contraceptive benefits of POPs. These include:

- Highly effective if correctly used
- Immediate return to fertility on discontinuation
- Pelvic examination is not required to initiate use

In addition, there are also several non-contraceptive benefits, which should be taken into account, namely:

- Do not affect breast feeding
- Lighter, shorter periods
- Decrease in breast tenderness
- Do not increase blood clotting
- Decrease dysmenorrhoea
- Protect against endometrial cancer

The main limitations of POPs are that they provide a slightly lower level of contraceptive protection than combined oral pills. They also require strict pill taking, preferably at the same time every day. Effectiveness may be lowered by the use of other drugs, for example, anti-tuberculosis and anti-epileptic drugs. In addition, they do not provide any protection against STIs including Hepatitis B and HIV/AIDS.

Who Can Use Progestin Only Pills?
The following categories of women are able to use progestin only pills:

- Women of reproductive age
- Women of any parity, nulliparous included
- Breast feeding mothers after six weeks post partum
- Heavy smokers of any age
- Women who can't use combined oral pills due to oestrogen related contra indications
- Post abortion patients
- Women with sickle cell disease, hypertension, and valvular heart disease

However, you should note that the following categories of women do not make ideal candidates for the use of progestin only pills:

- Breast feeding mothers who are less than six weeks post natal
- Women who are pregnant or suspected to be pregnant
- Women with unexplained abnormal vaginal bleeding
- Women who have breast cancer or history of breast cancer
- Women with active liver disease

Emergency Hormonal Contraception (EC)

Emergency contraception is most commonly used in cases of unplanned sex, rape or a burst condom. There are several types of emergency hormonal contraceptives:

- One tablet of 75 microgram pill (for example, postinor), which should be taken within 72 hours of unprotected intercourse. Repeat same dose within 12 hours. Requires total of two tablets of 75 micrograms pill.
- Two tablets of 50 microgram pill (for example, eugynon), which should be taken within 72 hours of unprotected intercourse. Repeat the same dose in 12 hours. Requires total of four tablets of 50 microgram pill.
- Four tablets of 30 microgram pill (for example, microgynon), which should be taken within 72 hours of unprotected intercourse. Repeat same dose in 12 hours. Requires total of eight tablets of 30 microgram pills.

The main advantage of the emergency contraceptive is that it provides emergency protection for about 85% of those at risk. However, it has several limitations. It is only effective within 72 hours of unprotected intercourse. It cannot and should not be used as a regular method of contraception. It does not protect against STIs or HIV/AIDS. As a minimal side effect, it may cause nausea.

Remember:
Emergency contraception should be used by patients in need of emergency protection but should not be used by patients who require regular protection and/or patients who are known to be pregnant.

Injectables

There are several types of injectable contraception. These are:

- Depo provera or megestron, which are given every three months (or 84 days) but can be given 28 days earlier or 14 days later.
- Noristerat, which is given every two months (or 56 days) but can be given 14 days earlier or seven days later.
- Monthly injectable, for example cyclofen, cycloprovera and norigynon. These are given every month but can be given up to three days earlier or later.

The main contraceptive benefits are:

- They are highly effective and consistently inhibit ovulation.
- A pelvic examination not required before starting.
- They do not contain oestrogen so there are no risks of cardiac or blood clotting effects.
- They are long acting methods.

The major non-contraceptive benefits are:

- They protect against endometrial cancer.
- They reduce menstrual flow.
- They decrease sickle cell crises.
- They help prevent ectopic pregnancy.

However, there are several limitations to this contraceptive method. There is the risk of a delay in fertility return for four or more months. There may be a change in the menstrual cycle. They do not protect against STIs, HIV/AIDS or Hepatitis B.

The following types of patients can use injectable contraceptives:

- Women of reproductive age, including nulliparous, with established menses.
- Those in need of high and longer protection.
- Breast feeding mothers six weeks after delivery and immediately if not breast feeding or post abortion.
- Those with certain medical conditions including sickle cell, diabetes, and valvular heart disease. However, evaluation and medical follow up is required while on this method.
- Those who cannot take a pill every day.

The following individuals should not use the injectable method of contraception. Women who:

- Are breast feeding before six weeks after delivery.
- Are pregnant or suspect pregnancy.
- Have active liver disease.
- Indicate suspicious abnormal vaginal bleeding.
- Have medical conditions, like ischaemic cardiovascular disease, diabetes mellitus with vascular disease or high blood pressure of 160/100 or more.

Implants

An implant is also a progestin but is long acting. It is like a natural hormone made of six plastic capsules. One example is norplant 36mg, where each capsule consists of 6mg of levanogestrel. However, jadelle is currently the implant used in Kenya.

The main contraceptive benefits of the implant are:

- It is highly effective.
- There is an immediate return to fertility.
- It offers continuous long term protection (five years).

The main non-contraceptive benefits of the implants are:

- No effect on breast feeding
- Lighter, shorter periods
- Decreased breast tenderness
- Decreased dysmenorrhoea
- Does not increase blood clotting disorder
- Protects against endometrial cancer

However, there are several limitations associated with the implant. It must be inserted and removed by trained providers. It involves minor surgery with appropriate infection prevention. You must practice asepsis on insertion and removal. Finally, it does not provide protection against STIs, HIV/AIDS or Hepatitis B.

Who Can Use Implants?

The following categories of women can use implants:

- Women of reproductive age
- Women of any parity, nulliparous included

- Breast feeding mothers after six weeks post partum
- Heavy smokers of any age
- Women who can not use combined oral pills due to oestrogen related contraindications
- Post abortion patients
- Women with sickle cell disease, hypertension or valvular heart disease

However, there are several categories of women who cannot use implants and you must note these carefully:

- Breast feeding mothers less than six weeks post natal
- Pregnant or suspected to be pregnant
- Women with unexplained abnormal vaginal bleeding
- Women who have breast cancer or history of breast cancer
- Women with active liver disease

SECTION 4: OTHER CONTRACEPTIVE METHODS

Introduction

In this last section on contraceptive technology you are going to cover Intra Uterine Contraceptive Devices (IUCDs), Voluntary Surgical Contraception (VSC) for instance Bilateral Tubal Ligation (BTL), and vasectomy. Lastly, you will cover the barrier (conventional) methods, which are condoms, spermicides, the vaginal sponge and diaphragm.

Objectives

By the end of this section you will be able to:

- Describe what is an intra uterine contraceptive device
- Explain the two types of voluntary surgical contraception
- List the common barrier methods used in FP

Intrauterine Contraceptive Devices (IUCDs)

These are plastic or medicated plastic objects designed in different shapes and forms which, when inserted into the uterine cavity, prevent pregnancy.

- Spermatozoa immobility as the movement is hindered.
- Ovum motility increased in the fallopian tube so it reaches the uterus prematurely.
- Prostaglandin produced in the uterine cavity aids in expulsion of the zygote.
- Implantation interfered with, as the IUCD occupies the space.
- Endometrium: there is inflammatory process that is hostile for implantation.

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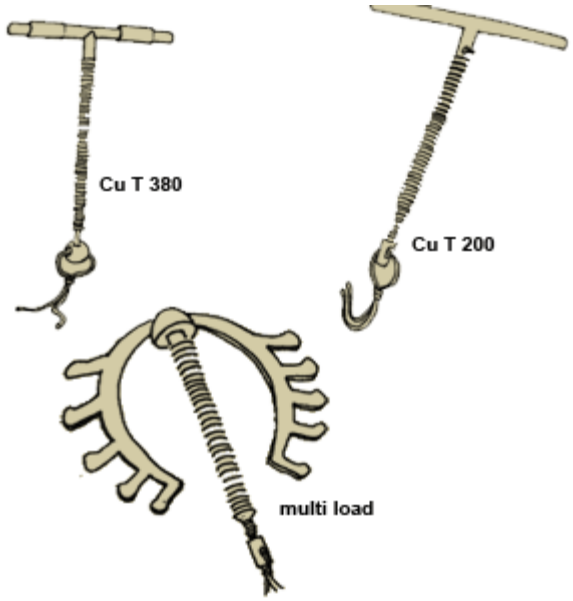
S	Spermatozoa immobility as the movement is hindered.
O	Ovum motility increased in the fallopian tube so it reaches the uterus prematurely.
P	Prostaglandin produced in the uterine cavity aids in expulsion of the zygote.
I	Implantation interfered with, as the IUCD occupies the space.
E	Endometrium: there is inflammatory process that is hostile for implantation.

Can you list the different types of IUCD that you have heard of or know to be available in a health facility?

Did you think of these?

- Cu T 380A
- Cu T 220
- Nova T
- Cu 7
- Multi load 375
- Multi load 250
- Hormone releasing IUCDs eg mirena



There is also the Lippers loop, which is non-medicated and spiral shaped, with an indefinite life span. However, this is currently not in circulation. The medicated IUCD has a copper wire around the shaft that discharges copper ions which increases the efficiency.
The main contraceptive advantages of IUCDs are that they are highly and immediately effective,
offer long term protection before deciding on a permanent method and they enable an immediate
return to fertility upon termination of use.
IUCDs also have some non-contraceptive advantages, which include that there is no interference with intercourse. They can comfortably be used by breast feeding women.

Limitations of the IUCD
On recommending IUCDs to the patient you should always ensure that they are aware of the following limitations:

- The device requires a skilled and competent practitioner to insert it in order
  to prevent infection during insertion and removal.
- It may increase menstrual flow and cramps
  for the first few months but the patient will
  eventually readjust.
- The device does not prevent ectopic pregnancy.
- It does not protect against STIs, HIV/AIDS and Hepatitis.
- The device may be expelled or translocated.
- Perforation may occur if inserted by an unskilled provider.

Who Can Use IUCDs?
The following categories of women can use IUCDs:

- Women of reproductive age irrespective of parity
- Women and partners with low risk of STI
- Breast feeding mothers
- Post natal mothers, where a post partum IUCD is inserted from ten minutes to 48 hours post delivery

Meanwhile certain women should not use IUCDs, including:

- Women who have, or whose partners have, multiple
  sexual partners
- Women who are pregnant or suspect pregnancy
- Those with current, recent (within three months) or
  recurrent pelvic inflammatory disease
- Women with anaemia
- Women with unexplained abnormal vaginal bleeding
- Women with cancer of the reproductive organs
- Women with congenital uterine abnormalities or fibroids, which distort the uterine cavity
- Recent septic abortion (in the past three months)

Can you think of five instructions you would give a woman who has had an IUCD inserted?
Did you include the following?

- She should observe good personal hygiene
  to prevent infection.
- She may have increased cramps and bleeding
  for the first three months. Advise her to use
  analgesics if pain is severe but reassure her
  that she will adjust with time. Ask her to come
  to the clinic if pain and bleeding are excessive.

- During menses, check pads before throwing them away to confirm the device has not been expelled.
- Check on IUCD threads once every month after menses while bathing.
- The IUCD failure rate is 1%.
- The first review will be at six months, then yearly when general physical examination and Pap smear are done.

You should also inform the patient that she should be aware of certain danger signs, which should be reported to the clinic. These include pelvic pain or painful intercourse, which means the IUCD could be dislodged. Any unusual bleeding or bad vaginal discharge could be indications of an infection. A missed period or other signs of pregnancy and missing IUCD strings should also be reported.

Pelvic Examination and IUCD Insertion Procedure

The aseptic technique is observed. Thefollowing equipment should be used:

Two cusco speculums

One tenaculum

One sponge holding forceps

One uterine sound

One curved pair of scissors

IUCD packet

Artery forceps

Non-toothed dissecting forceps

Kidney dishes

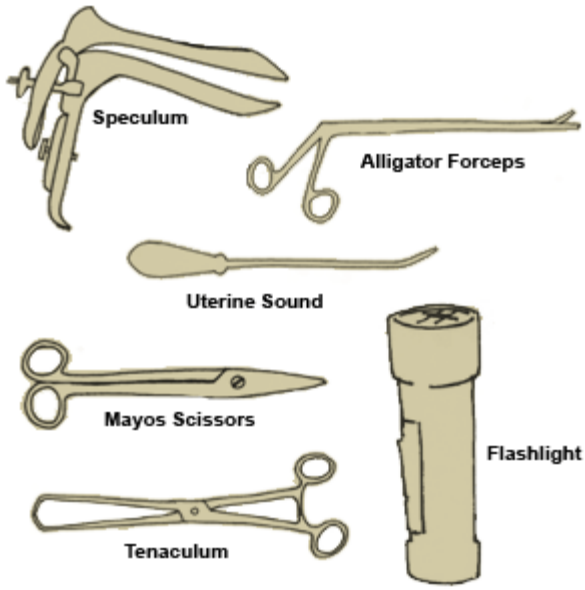
Suitable bowls for swabs

Sterile gloves

Sterile swabs

Sanitary pads (towels)

Antiseptic
Good lighting



Speculum Examination

The following procedure should be followed when conducting a speculum examination:

- Explain the procedure to the patient
- Let the patient empty her bladder
- Ensure privacy
- Put the patient in the dorsal position and cover up the abdomen
- Inspect the external genitalia
- Lubricate the speculum with water
- Insert the speculum into the vagina with blades laterally
- Open the blades and visualise the cervix then check for discharge, colour and erosion
- Take specimen for laboratory test if indicated
- Unscrew and remove the speculum and examine the vaginal wall as you come out
- After the speculum, you can then perform digital examination

Bimanual or Digital Examination

The following procedures should be followed when carrying out a bimanual examination:

- Swab the vulva with antiseptic systematically
- Lubricate gloved fingers and insert into the vagina
- Check the state of vagina
- Locate the cervix, cervical os whether anterior, midpoint or posterior

- Check if the position of the uterus is anteverted or retroverted
- Palpate the adnexae for tenderness
- Check on the pelvic muscle tone
- As you come out, squeeze Skene's glands
- Check on the gloves for blood if on menses

If there is any possibility of pelvic infection or pregnancy, do not insert IUCD.

IUCD Insertion

The following procedure is to be adhered to when inserting the IUCD.

- After the bimanual examination, reinsert the second speculum
- Screw after visualising the cervix
- Swab the os with antiseptic using the sponge forceps x three
- Apply tenaculum at 10 to 2 o'clock to position the uterus
- Sound the uterus gently to get the measurements of uterine size
- Load the IUCD while inside the pack and measure per uterine sound results, unpack then, without contamination, insert in situ gently as patient pants
- Release wings by withdrawing the barrel, remove piston, position IUCD by pushing barrel up again (CUT 380A)
- Withdraw barrel and shorten thread
- Remove tenaculum
- Clean cervix with antiseptic and arrest bleeding
- Reinstruct patient and give return appointment
- Decontaminate all the equipment used in the disinfectant using prevention of infection guidelines

Review the instructions previously given with the patient after the IUCD insertion.

IUCD Removal

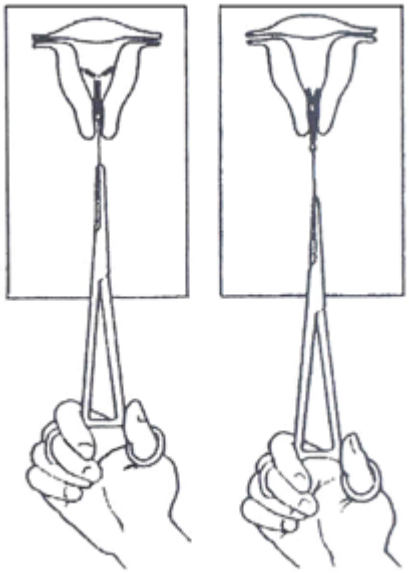
The IUCD should be removed if the patient decides that they would like to change their contraceptive practices or if the device is causing undesirable effects.

The main requirements for IUCD removal are similar to the requirements for the pelvic examination in IUCD insertion, excluding:

- Sponge holding forceps
- Artery forceps
- Pair of scissors
- Cusco speculum
- Alligator forceps
- Antiseptic and sterile swabs

The mother should be prepared physically and psychologically and placed in dorsal position. The procedure should then be conducted as follows:

- Perform digital and speculum examination
- Clean the cervix and visualise the IUCD thread
- Apply the tenaculum and align the uterus
- Using the artery forceps, grasp the thread and apply traction as the mother pants
- Show the device to mother on removal
- Remove the tenaculum, clean cervix and arrest bleeding
- Remove the speculum and make patient comfortable
- Give a sanitary pad
- Offer an alternative method of contraception if need be



Voluntary Surgical Contraception

Voluntary Surgical Contraception (VSC) is a surgical means of permanently terminating fertility.

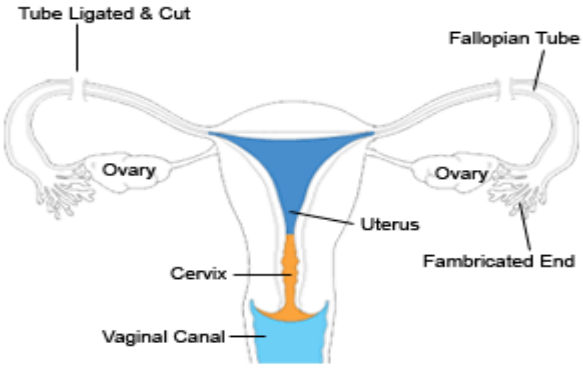
In the bilateral tubal ligation, both fallopian tubes are tied and cut to terminate the continuity pathway for spermatozoa and ovum.

In a vasectomy, both vas deferens are tied and cut so that spermatozoa do not reach the urethra to be deposited during intercourse. Thus the semen becomes sperm free.

Bilateral Tubal Ligation

The two methods of tubal ligation are:

- Laparatomy
- Laparoscopy



It is suitable for

- Those who have had their desired number
  of children
- Those who have chronic medical conditions such as renal, heart, uterine and
  ovarian diseases
- Those who want a permanent method of contraception (after counselling)
- Those who understand and voluntarily follow an informed consent procedure after
  proper counselling

Certain women are not advised to use this method of contraception.

Additionally, patients should be informed that there are certain limitations associated with the procedure.

Limitations associated with the procedure are:

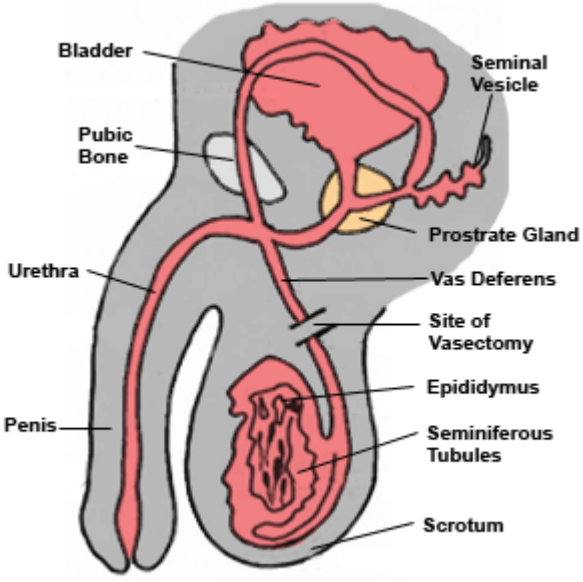
- The procedure is generally irreversible and expensive
- There are risks and side effects associated with anaesthesia
- Risks related to surgical procedure such as bleeding, haematoma or infection
- The method does not protect against STIs, HIV/AIDS

Vasectomy

A vasectomy is recommended when the family has reached the desired family size, the wife has contra indicated to surgical procedure and male participation is promoted.

However, you should note that the procedure is contra indicated in the following circumstances:

- A large hydrocele
- Chronic genital tract infection
- Diabetic patient
- Inguinal hernia unless after repair



The following instructions should be given to the patient following a vasectomy:

- Advise the patient to rest for two days and avoid heavy lifting for five to seven days.
- A scrotal support should be used.
- The vasectomy is not effective immediately. The semen has sperms for three to four months, therefore requiring ten to fifteen ejaculations to be free from semen.
  The barrier method can be used for protection meanwhile.
- Vasectomy has a failure rate of 0.3%

The main complications of VSC are:

- Pain and bleeding which occurs due to surgery. Give analgesics for pain and watch for signs of bleeding and arrest it.
- Infections mean a strict aseptic technique should be observed to prevent infection.
- Granuloma/bleeders must be well ligated.
- Medical legal social problems could occur if there is premature sexual intercourse before the semen is sperm

free. Counsel, reassure and give proper instruction to the patient.

- Anastomosis increases the failure rate.
- The patient should be reassured with regard to sperm antibodies reaction.
- The patient also needs reassurance, usually psychological about the possibility of impotence/low libido.

Barrier Methods of Contraception

The barrier methods are the last to be covered, not because they are a lesser method but because they may have to be used as a backup method for the prevention of STIs, HIV/AIDS while using those other methods.
The barrier method works by barring spermatozoa from getting into the cervix, uterus and fallopian tubes for fertilisation.

Can you think of four barrier methods most commonly used in family planning?
Did you think of condoms, spermicide, diaphragm and vaginal sponge?
These methods will now be covered in more detail.

The Condom

This is a sheath that fits over the erect penis or is inserted into the vagina, and acts as a barrier to the transmission of semen into the vagina.
There are two types of condoms:

- Male condom
- Female condom

Condoms should be recommended in the following instances:

- For males who want to participate in family planning
- As a temporary measure when not sure if patient is pregnant
- For sexually active teenagers
- For those patients contra indicated to other methods
- To reduce the spread of STIs, HIV/AIDS

You should always emphasise that there are certain problems associated with condom use, as follows.

- The condom may slip. The male condom has to be properly applied and withdrawn when the penis is still erect.
- It may tear. You should remove air.
- The user may have an allergy to rubber.
- There is a failure rate of 2-15%.
- It should be used only once and discarded.

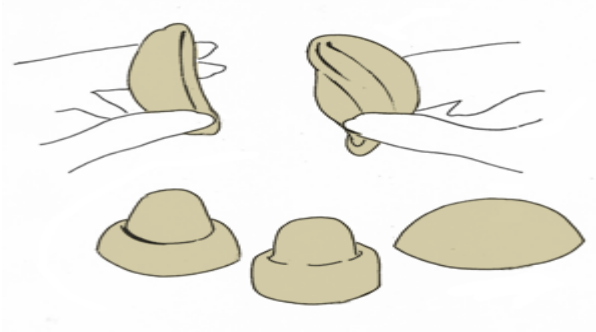
Precautions should always be taken. Advise patients to check the expiry date and to ensure proper storage, use and disposal.

Diaphragm

This is a dome shaped rubber device with a flexible rim inserted into the vagina prior to sexual intercourse to prevent conception by forming a barrier. It has to be removed six to eight hours after intercourse. Diaphragms are of different sizes so as to fit well the individual patient.
When using the diaphragm, the following precautions should be taken:

- Efficacy is improved if used with spermicides
- The patient should ensure that it fits well
- There is a failure rate of 2-15%

Contra indications include an allergy to rubber, uterine prolapse and recurrent cystitis.
You should instruct the patient to remove the device six hours post intercourse and to ensure that it is washed and kept dry.



Vaginal Sponge

This is a synthetic sponge impregnated with spermicides, which is inserted high into the vagina. It is effective for up to 24 hours. People who have a vaginal infection or allergies should not use it. The device remains in situ for six hours after intercourse, after which it is removed and discarded.
The main disadvantage of the vaginal sponge is that it is very expensive.

Spermicides

These are usually supplied in the form of gels, aerosols, pessaries or foaming tablets, which are inserted high into the vagina.

Spermicides work in the following ways:

- They kill spermatozoa and some organisms such as gonococcal bacteria and treponema pallidum
- They are usually applied on condoms and the diaphragm
- They have a failure rate of 14-25%

UNIT FIVE: GYNAECOLOGY

Gynaecology refers to diseases or conditions peculiar to women's reproductive systems. Patients with gynaecological disorders require a lot of understanding because of the emotional and the physical considerations that govern the situation. You should always respect the confidentiality of the patient's problems and share any information obtained only with those directly involved professionally with the care of the patient.

Unit Objectives

By the end of this unit you will be able to:

- Explain gynaecological investigations for patients with reproductive disorders
- Describe menstrual disorders and provide appropriate care
- Describe bleeding disorders in early pregnancy and take appropriate action
- Describe the appropriate management of genital disorders and injuries
- Describe the management of infertility and climacteric crisis
- Describe neoplastic conditions and take appropriate action

SECTION 1: GYNAECOLOGICAL INVESTIGATIONS

Introduction

Just like any other aspect of medicine, gynaecology and obstetrics require some investigative work. As a health worker, you must find clues in the patient's history and physical examination to help you make the right diagnosis. The more thorough the history and physical examination, the better the chances of making an accurate diagnosis.

You may also need to carry out certain tests and investigations in order to come to the correct conclusion. However, in order to take a complete history and conduct a thorough investigation, you need to know what in particular you are looking for.

Objectives

By the end of this section, you will be able to:

- Describe history taking
- List various tests and gynaecological radiographic
  diagnostic procedures

Gynaecological History

History taking should place an emphasis on the gynaecological history of the patient. This does not mean that other histories should be ignored. For the sake of minimising repetition, you will not go through the whole process. When taking a gynaecological history, you should enquire into the following:

Menstruation

Menstruation, including the age at which she had her first menstrual period, that is, menarche equivalent to 'K', the length of the menstrual cycle, duration of the periods and the amount of blood loss and regularity as well as the date of the Last Normal Menstrual Period (LNMP).

Always record this information as 'K 13 5/28 regular'. This means that the periods began at the age of 13, last for five days and occur every 28 days.

Gynaecological Operations

Take the history of any gynaecological operations, including the dates of operations. Possible gynaecological operations include dilatation and curettage, evacuation, laparotomy and hysterectomy and post-operative outcomes.

Contraceptive History

Take the patient's contraceptive history, especially on surgical contraceptions, including the type of contraceptive, duration of use, side effects and when she stopped using it.

Sexual Behaviour

Ask about the patient's sexual behaviour, noting that questions should be non-judgemental and you should not embarrass the patient. You should find out whether she is sexually active, whether the relationship is satisfactory and, if not, why. For example, find out if she has painful or difficult sex referred to as dyspareunia. In case of infertility find out also whether intercourse is normal, frequent and what time in the cycle. You need to ask if there is any post-coital bleeding or not. This information may well help you to detect any sexually transmitted diseases.

Lifestyle Habits
Ask if she smokes or takes alcohol.

Summary
You should make a summary of the history you have taken by picking out the important positive and negative information obtained. This will guide you when performing a physical examination.

Physical Examination

A physical examination should be made up of a general, abdominal and vaginal examination. Abdominal and vaginal examinations were covered in module one, unit two, section three, so for now you will only look at general examination in detail.

General Examination
A general examination provides more information about a patient and also gives the clinician a chance to establish a rapport with the patient. General examination usually includes a check on the vital signs and the general condition of the patient. When you are doing a general examination, you should look for the development of secondary sexual characteristics, including breast development (palpate for masses) and body hair distribution, especially the pubic hair. Hair on the chest and chin in a female will mean that she has more androgens.

Remember:
Antiseptic is not used in this procedure because a specimen may be taken. If antiseptic is used to clean the vulva, it will destroy organisms hence leading to a false result.

Gynaecological Tests

As mentioned earlier, there are a number of laboratory tests and radiological investigations that you can carry out, in order to reach a definitive diagnosis.

Urine
Urinalysis should be carried out to check the appearance of the urine, including colour and foam, chemical content such as protein and glucose, and micro-organisms such as bacteria and parasites.
A pregnancy test, if indicated, may be performed.

Blood
Blood should be tested for haemoglobin levels (Hb) or full haemogram, Widal test and brucellosis test and also for VDRL (syphilis).

Vagina and Cervix
Urethral smears and pus swabs should be taken to test for neisseria gonorrhoea. Take a high vaginal swabs test for candida albicans, trichomonas vaginalis, and neisseria gonorrhoea. You should also perform a cytological test for cancer as well as a cervical biopsy for further histological assessment, which will be covered later in this unit.

Cytological Test/Papanicolao Test (Pap Smear)
This is a test that should be carried out on women of reproductive age once every year. Cancer of the cervix is one of the leading causes of mortality among women worldwide.
This test reveals the cancer in its early stages when it can bemanaged effectively.

Cervical Biopsy
This test can also detect problems on the cervix. It may be done as an office procedure without anaesthesia, whereby the lesion is visualised by a colposcope and one or more punch biopsies. A colposcopy is a binocular inspection of the cervix with a magnification of up to 20 times.
The patient is advised to rest for 24 hours after a biopsy and to leave the packing or tampon in place for the recommended time, usually 8 to 24 hours. Vital signs should be frequently checked and any excess bleeding reported. Sexual intercourse should be delayed until the physician indicates that it is permissible.

Endoscopic Examination
This examination involves entering the body organs by use of a scope. A scope is a special tubular instrument with a light attached to the end. When introduced into the hollow organs of the body they can be seen and studied. There are various types of endoscopic examinations.
The pelvic endoscopy/culdoscopy involves the use of a culdoscope, which is a tubular, lighted instrument similar to a cystoscope or laparoscope. An incision is made in the posterior

vaginal
cul-de-sac (fornix) to admit the instrument. It is commonly used to detect any pelvic masses. The patient is prepared as for vaginal operation and may be under local anaesthesia. The procedure is conducted in the operating room, with the patient in a knee-chest position.

Laparoscopy
Indications are similar to that of a culdoscopy. However, with laproscopy, it is also possible to perform minor operative procedures like tubal ligation, ovarian biopsy and lysis of peritubal adhesion.
During this examination, a scope (of about 10mm diameter) is inserted into the peritoneal cavity through a two centimetre sub-umbilical incision to allow visualisation of the pelvic structure. Dilatation and curettage follows, to position a surgical instrument, which permits manipulation of the uterus during the laparoscopy, thus affording better visualisation.

The coldlight endoscope is passed through the cannula and the inspection made. An assistant or the operator himself can move the uterus about by means of the forceps on the cervix and a dilator or Spackman's cannula in the uterus. A camera attached to the eyepiece of the laparoscope permits assistants and observers to share the surgeon's view on a video screen and permits video recording of the findings or procedure.
Drapes are used during this procedure, but have been omitted in the illustration to allow unobstructed view.
Special biopsy forceps can be passed through another cannula and used to lift up any tissue that may be obstructing the view or to take ovarian biopsies. Some adhesions may be divided using laparoscopy scissors. Many procedures are now performed entirely or assisted by laparoscopy.

A better view of the pelvis, lower abdomen and visceral contents is also facilitated by injection of a prescribed amount of CO^2 intraperitoneally into the cavity (insufflation). This separates the intestine from the pelvic organs.
The procedure is performed under general anaesthesia, meaning patients have to be prepared preoperatively. The patient is carefully observed for several hours to detect any complications, for example, bleeding or burns from the coagulator. The observation includes monitoring vital signs and signs of per vaginal bleeding. Reassure the patient and discharge when the vital signs become stable.
Next, move on to look at another procedure, which involves entering into the uterine cavity.

Hysteroscopy
This procedure is indicated as a diagnostic measure only in complex situations, for example, infertility, unexplained bleeding and retained Intrauterine Device (IUD).
The hysteroscope is used to visualise all the parts of the uterine cavity. This procedure is best performed about five days after completion of menstruation (estrogenic phase of the menstrual cycle). This is because the fresh/new cells lining the uterine cavity can be studied properly in order to give accurate findings.

Remember:
Hysteroscopy is contraindicated in patients with cervical or endometrial carcinoma due to dissemination of cancer cells.

Next move on to look at radiographic diagnostic procedures. It is important for you to know them so that you can provide appropriate care and advice to the patient undergoing these tests.

Many radiological procedures, for example, x-ray films, barium enemas and intravenous urography, are helpful in the diagnosis of pelvic conditions. A few of the procedures specifically related to the diagnosis of gynaecological disorders will be covered here.

Hysterosalpingogram (Uterotubogram)
This is an x-ray study of the uterus and uterine tubes after injection of a contrast medium. This is done to study sterility problems, tubal patency and/or the presence of pathological conditions in the
uterine cavity.
A patient undergoing this examination should have her intestines evacuated by enema. 'Starve' the patient for at least four to six hours. Give analgesic for comfort since some patients may experience nausea, vomiting, cramps and faintness. Briefly explain the procedure to the patient and give reassurance. Observe the vital signs.
The patient may feel some discomfort after the procedure. You should continue observing her vital signs and if the patient is not nauseated, give her food as soon as she can tolerate it. You should also provide plenty of fluids to flush the urinary system.

Computerised Tomography (CT Scanning)
A CT scan can reveal the presence of cancer and its extension into the retroperitoneal lymph nodes and skeletal involvement.
The CT scan has several advantages over an ultrasound and it is more effective, especially with obese patients and/or patients with a distended bowel or stomach. This is because it penetrates deep into the organ targeted and reveals more information about these organs. In preparation, the patient should be 'starved' before this procedure.
The scanner takes repeated x-ray pictures of a cross-section of the body (nearly 300 pictures within five seconds) as the x-ray tube is rotated around the patient.
Some absorption of x-rays takes place according to the density of the tissues through which the x-rays pass. Thus the difference between the amount of radiation entering the body and amount measured by the detectors is equivalent to the density of the tissues.

Ultrasound
This is commonly used and does not require any special preparation of the patient, except to ensure that they have a full bladder. This is because a distended bladder usually pushes the uterus out of the pelvic cavity allowing it to be properly viewed. It is used to diagnose pelvic tumours and other abnormalities.

SECTION 2: MENSTRUAL DISORDERS

Introduction

In this section you are going to focus on menstrual disorders. Menstruation is a normal body event in every woman, even though for some it may be an uncomfortable experience. On a light note, however, there is an old adage that says 'the menstrual flow is the tears of a disappointed uterus'.

Objectives

By the end of this section, you will be able to:

- Describe factors that influence menstruation
- Describe the various menstrual disorders and their management

Factors Influencing Normal Menstruation

The events occurring in the following organs influence the mechanism of normal menstruation:

- The hypothalamus influences the anterior pituitary gland to produce follicle stimulating hormone.
- The anterior pituitary gland produces follicle stimulating hormone, which matures the Graafian follicle under the influence of the hypothalamus. It also produces the luteinising hormone, which influences the development of corpus luteum to produce oestrogen or progesterone.
- The ovaries develop the Graafian follicle.
- The uterine endometrium thickens under the influence of oestrogen and progesterone, in preparation to receive the ovum.

Menstrual Disorders

Amenorrhoea
Amenorrhoea is a symptom, not a disease. It is derived from the Greek word amenrein, which translates as follows:

- A... without
- Men... month
- Rein... to flow

It can, therefore, be interpreted to mean 'without monthly flow', thus amenorrhoea means 'absence or cessation of menstruation'. The absence of menstrual periods can be physiologically normal.
Move on to find out at which point amenorrhoea is considered to be normal.

Name at least three periods in a woman's life when amenorrhoea is considered normal.
Your answer should include the following:

- Before puberty, when the hormones concerned have not started functioning.
- During pregnancy, when the hormones concerned are diverted to the growth of the fertilised ovum.
- During lactation (after delivery), which results in lactation amenorrhoea due to the presence of prolactin.
- At menopause, when the hormones diminish and cease to be produced.

You have focused on pathological amenorrhoea, which can be divided into two, namely primary and secondary amenorrhoea.

Primary Amenorrhoea
Primary amenorrhoea means that menstruation has never occurred. This is seen in a young woman who is over 17 years of age and who has not yet begun to menstruate but exhibits signs of sexual maturation. Pathological primary amenorrhoea is when the patient has never menstruated and has not developed secondary sexual characteristics.

Primary Amenorrhoea
There are two main factors that lead to primary amenorrhoea. These are hormonal factors and developmental anomalies.

Hormonal Factors
This is due to the malfunctioning of the pituitary gland. As a result, the hormones responsible for sex maturation are affected, which in turn affects the beginning of menstruation.
In Cushing's syndrome, the excessive production of cortisols may hinder menstruation from starting.

Developmental Anomalies
During the development of the foetus, the vagina, uterus or ovaries may fail to develop. The congenital abnormality in the vagina that causes primary amenorrhoea is an imperforate hymen. In this case, the girl experiences all the feelings and discomforts of menstrual flow. There is actually menstruation and the blood accumulates behind the hymen, (in the vagina), but does not come out. This condition is known as cryptomenorrhoea and when not treated, the uterus distends, leading to what is known as haematometra. The girl may present with abdominal pain and the absence of menstruation. The condition can be cured by an incision of the hymen to allow the blood to flow out freely. After the incision you should advise the girl to maintain high standards of hygiene. The vulva should be cleaned three times a day until healed.
Other causes include male pseudohermaphroditism (a male develops as a female) and Turner's syndrome where one has only one x-chromosome.
Now move on to look at secondary amenorrhoea.

Secondary Amenorrhoea
Secondary amenorrhoea simply means that the periods, which were once present, have stopped.
There are some women who have a longer cycle of up to two to three months and this is considered normal as long as it is regular. However, secondary amenorrhoea occurs after a normal menarche, which then ceases for more than six months. Six months is a considerable duration for it to be abnormal.
Now move on to look at some of the possible causes of secondary amenorrhoea.

Hormonal Disturbances
Hormonal disturbances in the pituitary gland can lead to hypopituitarism, especially after severe postpartum haemorrhage and collapse. This leads to pituitary cachexia/Sheehan's disease. In this condition, there is temporary deprivation of blood supply to the pituitary, leading to ischaemia. This impairs the functions of the pituitary gland.
In addition, disturbances in the adrenal gland, thyroid gland and/or ovaries can affect the influence of the hypothalamus on the pituitary gland.

Debilitating Systemic Disorders
Chronic diseases that cause general ill health, for example, genital tuberculosis, or severe anaemia may lead to secondary amenorrhoea.

Nervous Disorders
Any stress can act on the hypothalamus to inhibit follicle stimulating hormone/leutinising hormone-releasing hormone.
This may lead to stress or hypothalamic amenorrhoea. Minor emotional upsets related to being away from home, attending college, tension from schoolwork or interpersonal problems are the most common causes of secondary amenorrhoea, especially in adolescents.
Other related disorders that cause stress include longstanding psychiatric disorders, especially depression or anxiety and stress due to exercise, which leads to exercise amenorrhoea. This is especially common in marathon runners.
Others include brain tumours which may destroy the hypothalamus.

Drugs
Contraceptives may lead to post contraceptive amenorrhoea and in some individuals it may take three to six months before the return of menstruation. This is because the ovulation had been suppressed and therefore had an effect on the hormones concerned.
Phenothiazines, especially in large doses, may lead to amenorrhoea due to prolactinaemia and certain hypotensive agents have also been implicated. You may remember (as mentioned in lactation amenorrhoea) that these drugs stimulate prolactin.

Dietary Amenorrhoea
Loss of weight due to prolonged fasting will affect the hypothalamic function in ways which are not yet understood. Nutritional deficiency will also affect menstruation.

Ovarian Cysts
Ovarian cysts, especially follicular and corpus luteum cysts, cause amenorrhoea, however these tend to regress with time and menstruation resumes.

Oligomenorrhoea
Finally, this is a type of amenorrhoea where there is infrequent menstruation, which may occur months before menopause and, at times, due to emotional upset.
A woman with this problem should be investigated thoroughly to exclude other serious conditions, for example, neoplasms. You should reassure the patient if the cause of the condition is emotional.

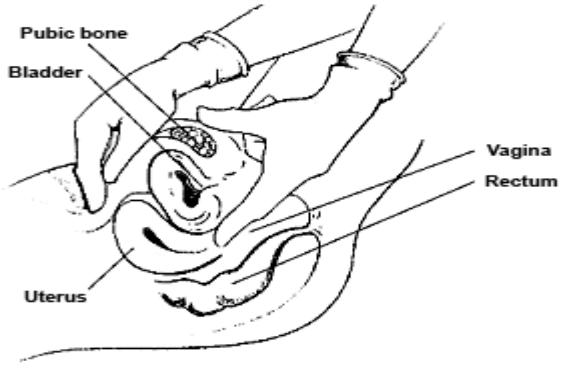
Management of Amenorrhoea
After discussing both types of amenorrhoea, you will now look at their management.
First, establish the cause of the condition. In each case you must take a detailed history and then carry out a clinical examination to rule out pregnancy.
You should also consider the general health of the woman, including psychological and environmental factors. In the case of a young girl who appears normal on examination, it is better to wait until she is 18 years old but in the meantime reassure her and give her health education on sexuality.

Remember:
The most common cause of secondary amenorrhoea is almost always pregnancy, therefore, an obstetric and gynaecological history is important to making a diagnosis.

A series of investigations can be performed and these should include the following steps:

History Taking
This is very important as it helps you make a distinction between primary and secondary amenorrhoea and, therefore, institute appropriate management measures.
Some women have very infrequent and scanty bleeding, which is virtually primary amenorrhoea. If the patient is experiencing the physical disturbances of menstruation without actually bleeding, a cyclical change in the hormone level can be assumed and the cause of amenorrhoea is likely to be in the genital tract.

Pelvic Examination
It is essential to exclude pregnancy or uterine hypoplasia (in virgins this is usually done under general anaesthesia).
A bi-manual examination can reveal gross abnormalities such as cryptomenorroea.



Remember to inspect the secondary sexual characteristics during pelvic examination.

Radiological Examination
You should take an x-ray of the chest and a straight skull x-ray to detect enlargement of the sella turcica (pituitary fossa).
You will remember the pituitary gland plays a great role and chronic diseases like TB can affect menstruation.

Endocrine Tests
To find out the hormonal factors, the following should be carried out:

- Collection of urine samples for over 24 hours to measure levels of different hormones.
- Estimation of blood hormone levels. The hormones investigated are follicle stimulating, leutinising and prolactin. If there is hyper-prolactinaemia, then refer the patient to an endocrinologist for pituitary tumour investigation and management.

Laparoscopy
This is done to detect any developmental anomalies.
An ovarian biopsy can also be carried out during this procedure.

Dilatation and Curettage
This is commonly performed, especially in countries where tuberculosis is common. The presence of the acid-fast bacilli in the endometrial cells or any other organisms may be the cause of amenorrhoea.

Others
More recent technologies include the ultrasound or CT scan which detect various abnormalities. It can reveal the presence of tumours in the ovaries or the adrenal gland.

Management of Amenorrhoea - Medical Treatment
The medical treatment will depend on the cause of
the amenorrhoea.

Clomiphene Citrate (Clomid)
If ovulation is the problem, then it can be induced using clomiphene citrate. This drug should be restricted to those individuals desiring pregnancy because it acts on the Graafian follicle. It can also be used in adolescents with recurrent ovulatory bleeding in an attempt to establish regular ovulatory cycles.
The dosage initially given is 50mg daily for five days and ovulation is expected to occur five to eleven days following discontinuation. If there is no response, the dose is gradually increased up to 200mg.
Side effects of clomid include:

- Hyper-stimulation leading to enlargement of the ovaries.
- Multiple gestation because more than one ovum may mature.
- Abortion is common with patients treated for infertility.
- Teratology, that is, the increased incidence of congenital anomalies, if conception takes place while the woman is still taking the drug.
- Bloating, nausea and vomiting.

Human Menopausal Gonadotrophin (HMG) and
Human Chorionic Gonadotrophin (HCG) Pergonal
This is a preparation of leutinising hormone and follicle stimulating hormone extracted from human menopausal urine and is available in ratio of 1:1.
The therapy is indicated when there is failure to ovulate even after clomid administration for six to twelve months. The dosage is HMG 375 units daily, increasing progressively up to 1500 units daily.

Remember:
Hormonal monitoring during this therapy is important in order to keep the hormones in balance.

Bromocriptine
This is effective as an ovulatory agent in most patients with hyperprolactinaemia from an anaplastic source.
It acts by suppressing the central and peripheral concentrations of prolactin, so that its level stimulates the production of oestrogen and progesterone. The dosage initially is 2.5mg up to four weeks.

Other Agents
Other agents used for the induction of ovulation include glucocorticosteriods (dexamethosone 0.5mg nocte, prednisone 0.75mg) and oestradiol (estrogen).
Do not forget that emotional disturbance is one of the features that cause amenorrhoea. Such patients will require psychotherapy to relieve the tension/stress. Through history taking, you may be able to get clues to any emotional stress and try to allay the patient's anxiety.

Surgical Management
Pituitary tumours may require excision.
Now move on to look at the other group of menstrual disorders.

Dysmenorrhoea
Dysmenorrhoea means painful menstruation. Some women experience pain and discomfort during menstruation and many will learn to live with it. However, in some women the pain is severe enough to make the woman seek treatment.
There are two types of dysmenorrhoea:

- Primary Dysmenorrhoea (also known at Spasmodic Dysmenorrhoea)
- Secondary Dysmenorrhoea (also known as Congestive Dysmenorrhoea)

Now move on to look at these in more detail.

Primary (or Spasmodic) Dysmenorrhoea
You may have come across young girls seeking treatment due to abdominal pain during menstruation. This is a common complaint and usually starts soon after puberty, although the first few cycles may have been painless.
The pain starts at the beginning of the period and lasts from a few hours to two days. This pain is 'cramp-like' and is felt in the pelvic and lower back region, and may radiate into the legs. Severe pain is sometimes accompanied by nausea, vomiting and fainting. These reactions may encourage the woman to seek treatment.
The causes of this condition are not well known but several theories have been put forward. It may probably be caused by ischaemia due to prolonged contraction of the uterine muscle occurring in the first day of menstruation. The ischaemia means that oxygen to the uterine muscle is cut off accounting for the pain. In this case, it is said that childbirth may cure this condition since after the uterus has held the baby, it is more vascular and so not easily ischaemic.
It has also been posited that dysmenorrhoeic uteri are hypoplastic but there is no evidence. Endocrine abnormalities have occasionally been implicated, probably due to the imbalances. Prostaglandins from disintegrating endometrium may cause uterine spasms (that is why in cases of dysmenorrhoea the concentration of PGF2 in menstrual fluids is increased).
Psychological factors undoubtedly aggravate symptoms, for example, there may be fear of sexual or reproductive abnormalities, leading the uterus to spasm.
Cervical stenosis also seems to be a factor. It is believed that during pregnancy and delivery the stenosed cervix is dilated hence the reason the problem may disappear after delivery.

Management of Primary Dysmenorrhoea
Unfortunately, a spontaneous cure does not occur soon enough for most women who suffer from primary dysmenorrhoea. Therefore, as part of your management, you should perform the following:

- Take history with special reference to the severity and duration of the pain.
- Perform a physical examination to exclude pelvic tumours.
- Give a full and frank discussion of the normal cycle as this is an important part of treatment.
- Share health messages on the importance of exercise and the avoidance of unnecessary restriction of general activities.
- Provide women suffering from dysmenorrhoea with sympathy and support. Administer a suitable drug which will alleviate the pain sufficiently to allow a normal existence during the period time. Fortunately, patients tend to

improve or at least complain less as they grow older.

Drugs that can alleviate pain include any antipyretics and analgesics. These should be the most effective drugs to inhibit the synthesis of prostaglandin, that is, if the prostaglandin's theory
is correct.
These include aspirin and paracetamol, which are widely used and usually prescribed as two tablets three times daily. Mefenamic acid (ponstan) 500mg three times daily is also common. This drug is said to prevent the action of prostaglandin on muscles as well as inhibit its production. Other drugs include flufenamic acid (arlef) and indomethacin (indocid).
Many of these drugs are usually prescribed for the relief of rheumatic pain but have been used with success in dysmenorrhoea.

Remember:
These drugs must be used carefully as they can adversely affect patients with other medical disorders, including asthma. Do not give strong analgesics like morphine, pethidine and other addictive drugs.

Another effective management method is the contraceptive pill. In a small number of girls, when simple measures fail, they can be put on the family planning pill which, by inhibiting ovulation, will result in painless periods. These few individuals should be placed on the pill for four to six months continuously, after which the problem may disappear completely. This is achieved with a high-progesterone, low-oestrogen combined pill, for example, minovular.
Surgery, in the form of pre-sacral neurectomy, may be offered as a last resort to a patient whose dysmenorrhoea cannot be relieved by any other means and is interfering with her daily life.
Now move on to look at secondary dysmenorrhoea.

Secondary (or Congestive) Dysmenorrhoea
This type of dysmenorrhoea may be caused by some pathology in the pelvis. The patient usually complains of a dull aching pain in the lower abdomen. The pain commonly begins three to four days (or sometimes up to ten days) prior to menstruation, and ceases after the flow is established or may persist throughout the period.
Pain is often made worse by exercise.

Remember:
Dysmenorrhoea, which starts after the age of 30 years should always be investigated since it could be due to some pathology in the reproductive system.

The causes of secondary dysmenorrhoea include:

- Chronic Pelvic Inflammatory Diseases (PID)
- Endometriosis
- Uterine fibroids
- Abnormal fibrous attachments (adhesions)
- Salpingitis

These conditions and their management will be covered later in this unit and also in the next unit (unit six). It is important to remember, however, that in this country the most common cause of secondary dysmenorrhoea is chronic PID and also with most women complaining of infertility.
Treatment of the cause will usually relieve the dysmenorrhoea, but as you know successful treatment of chronic PID is difficult and so prevention should be emphasised.

Management of Secondary Dysmenorrhoea
Take a full history to find out the cause of the condition, so that the patient can receive treatment according to the cause.
There are other symptoms, which may cause dysmenorrhoea and these will be discussed in the next sub-section.

Pre Menstrual Tension Syndrome (PMT)
This condition is due to a large group of symptoms, which appear regularly and predictably about 12 days before the onset of menstruation. This group of symptoms includes:

- Water retention leading to weight gain, painful breasts, abdominal distension and feeling of bloatedness.
- Pain in the form of backache, headache, tiredness and muscle stiffness.
- Autonomic reaction, for instance, dizziness/faintness, cold sweats, nausea and vomiting and hot flushes.
- Mood change, including tension, irritability, depression and crying spells.
- Loss of concentration, manifested as forgetfulness, clumsiness, difficulty in

making decisions and insomnia (poor sleep).
- Miscellaneous symptoms, including feelings of suffocation, chest pains, heart pounding, numbness and tingling sensation.

Patients with the symptoms of PMT can be relieved by giving them diuretics, for example, chlorothiazide in the pre menstrual week. They can also benefit from oral contraceptives, for instance, progesterones like norethisterone 20mg daily from the 15th to 25th day of the cycle.
Tranquillisers and psychotherapy also appear to be equally effective.
Patients should be told about the physiology that is producing these symptoms because they may think they have a terrible disease and the worries may increase the intensity of these symptoms.
Dietary management involves taking a low salt diet and avoiding alcohol and caffeine.
Exercise is also recommended to relieve the symptoms.

Dysfunctional Uterine Bleeding (DUB)
Dysfunctional uterine bleeding is diagnosed by exclusion of the conditions, which cause bleeding from the uterus. The conditions to be excluded include:

- Infection
- Ruptured ectopic pregnancy
- Trauma
- Uterine fibroids and polyps
- Genital cancers
- Hormonal treatment

Once you have excluded the conditions mentioned above, the cause of DUB is most likely to be hormonal imbalance, which is associated with involuntary periods. As there is very little you can do, you should refer all patients with abnormal uterine bleeding to the hospital for investigations and management.

Remember:
If the patient is very sick due to excessive bleeding, then resuscitate and give intravenous fluids before referring.

In the hospital, teenage girls who have just started menstruating should be given a combination of oestrogen and progesterone. The contraceptive pill is a good option and treatment should be continued for three to six cycles. After treatment is stopped, menstruation often returns to normal.
For women in the reproductive age group, true dysfunctional bleeding is uncommon. The most likely cause of abnormal bleeding at this age is some complication of pregnancy. Diagnostic curettage is needed and you must remember the possibility of malignant disease.
In women over 40 years of age all the organic causes of bleeding, including malignant disease, may occur. Accurate diagnosis, including curettage is essential.

Menorrhagia
Menorrhagia is a normal cycle with an excessive loss of blood (heavy menstrual flow). The normal average volume of menstrual loss is approximately 70ml. Menstrual loss is naturally greater in parous women.
Menorrhagia is clinically an important condition because this excessive bleeding results in anaemia. It is not a disease but a symptom and to treat it one must find out what is causing it. The best way to manage this condition is to refer the patient to hospital where investigations will be carried out and managed appropriately.

The most common causes of menorrhagia include:

- Fibroids due to a larger endometrial cavity hence larger bleeding areas
- Chronic PID
- Endometrial polyps
- Abnormalities in the blood clotting power, for example, leukaemia, thrombocytopenic purpura
- Abnormal hormonal state, leading to excessively thick endometrium, which bleeds heavily when shed
- Emotional factors, which can sometimes cause
  heavy bleeding
- Intrauterine contraceptive devices

Some of these conditions will be discussed in a later part of this unit.

Management of Menorrhagia

The management of this condition includes:

- History taking followed by pelvic examination.
- Investigations of blood for abnormalities and checking Hb, grouping and cross-matching.

- Dilatation and curettage under general anaesthetic. This procedure may be curative if there is not any other abnormality. The patient should be prepared preoperatively and postoperative care should be provided as for any other surgical procedure.
- Older women can be better treated by a hysterectomy.

Metrorrhagia
This is menstrual bleeding lasting too long. It is caused by irregular shedding of the endometrium because the corpus luteum degenerates too slowly and the progesterone effect persists. Some secretory endometrium is still present early in the following cycle.
The causes of this disorder are:

- The possibility of cancer of the genital tract with this kind of bleeding.
- Uterine polyps projecting into the vagina may cause bleeding.
- Incomplete evacuation after abortion.
- Hydatid form mole.
- Chorion carcinoma.
- Occasionally women on oral contraceptives may have what is called 'break through bleeding'.

Management of Metrorrhagia
The management will include:

- Taking a detailed history.
- Performing a digital examination and speculum to visualise the cervix and even take a Pap smear, therefore, the patient should be referred to the gynaecologist as soon as possible.

Remember:
Never dismiss metrorrhagia lightly. A thorough examination should be performed.
Epimenorrhoea
This is when normal menstruation occurs too often due to a shortened luteal phase by early degeneration of the corpus luteum.

Management of Epimenorrhoea
The management of this condition will include:

- A detailed history to establish the cause.
- Refer all patients with abnormal bleeding to hospital for investigations and treatment.
- In the hospital teenage girls who have just started menstruating should be treated with a combination of oestrogen and progesterone contraceptive pill, which should be continued for three to six cycles.
- Meanwhile the patient should also be given iron to help replace any blood lost.
- In women of the reproductive age group, diagnostic curettage is needed. Remember the possibility of malignant diseases.
- Curettage may cure the condition, but if it does not, a hysterectomy may be the best option leaving the ovaries intact.

Hypomenorrhoea
This is when the period occurs on a regular basis but is minimal. For example, there are rare cases whereby a woman menstruates regularly twice or thrice in a year. This is considered to be normal although you may be able to guess what problems this woman may have? This will be covered later in this unit.

Endometriosis or Adenomyosis
This condition is as a result of the endometrial tissue being deposited in any organ of the body, for example, the ovary or uterosacral ligaments.
The ectopic tissue consists of both glands and stroma in which cyclical menstrual changes occur. Malignant changes are very rare. The process where the endometrial tissues invade the myometrium in the uterus is referred to as internal endometriosis or adenomyosis (the uterus is enlarged). There is no difference clinically between adenomyosis and fibroids on feeling the uterus, but they are different histologically.
Endometriosis occurs only in tissues adjacent to the Mullerian systems (a pair of ducts in the female foetus which develop into reproductive system). The theories, which explain the occurrence of endometriosis include that it may be disseminated by means of the lymphatic and vascular system, which is why endometrial tissue may be found in the umbilicus, forearm and thigh.

Endometriosis or Adenomyosis
Endometriosis is also strangely common in social groups where childbearing is delayed to the late twenties or early thirties. This might explain why it is rarely diagnosed before the age of 20 years and not apparent after menopause.
Physical signs will depend on the site of the disease and they include:

- 'Chocolate cysts' which are tender, fixed, bilateral masses, resembling chronic salpingo-ophritis but without any history of infection, fever or discharge.
- Uterine lesions may cause nodular or uniform uterine enlargement and may be clinically indistinguishable from fibromyomata or diffuse hyperplasia.
- Recto-vaginal lesions are tender, hard fixed and simulate rectal carcinoma.
- Local lesion, for example, in scars may be tender at menstrual periods.
- Dysmenorrhoea occurs and any palpable tumour may become painful at the time of the menstruation.
- Recto-vaginal lesions will cause dyspareunia.
- Menorrhagia and irregular bleeding occur from associated endometrial hyperplasia or from uterine lesions.
- Infertility occurs in 30% of patients with endometriosis and this is due to pelvic adhesions or endometrial abnormalities.

Management of Endometriosis

The first step is to take a detailed history to elicit the symptoms of dysmenorrhoea, menorrhagia and dyspareunia. There are rarely abnormal findings on abdominal examination.

Refer the patient to a gynaecologist. On vaginal examination, the uterus may be enlarged and tender (adenomyosis). Areas around the ovaries are tender and, characteristically, there is limited mobility of uterus. A cyst is sometimes palpable in either fornix.

Speculum examination may reveal typical areas of endometriosis in the cervix or vaginal vault. A laparotomy is indicated when cystic swelling is felt or if you are in doubt of the diagnosis.

If the patient is under 40 years of age, surgical treatment is usually designed to destroy areas of endometriosis using diathermy function. Hormonal therapy should include either progesterone steroids when confirmed, administered either cyclically or continuously for three to twelve months (this therapy suppresses the residual areas). Pregnancy is another way of suppressing the condition, and often has a curative effect on endometriosis.

Patients over 40 years of age may undergo a hysterectomy, which can include the removal of the affected ovary since hormonal therapy is not always helpful.

SECTION 3: BLEEDING DISORDERS IN PREGNANCY

Introduction

In this section you will look at bleeding disorders in pregnancy. These conditions are usually on the borderline between obstetrics and gynaecology, in the sense that they involve women whose pregnancy comes to a premature end. You will find that these patients are always treated in a gynaecological ward rather than in the maternity ward.

For the purposes of this unit, bleeding in pregnancy refers to any bleeding per vagina. This bleeding, however slight, should be taken seriously. It is sometimes the first sign of some of the most life-threatening emergencies in obstetrics such as ruptured ectopic, and incomplete abortion. You will look at the possible causes of bleeding per vagina during pregnancy, how each case presents, and how it should be managed. The procedure known as Manual Vacuum Aspiration (MVA) as part of post-abortal care will also be covered.

It is important for you to note that bleeding per vagina during pregnancy is a cause for concern to most mothers. This is particularly so in a mother who has had a previous experience of vaginal bleeding which resulted in foetal loss. You must, therefore, be aware of the mother's emotional situation when caring for her during the antepartum period.

Objectives

By the end of this section you will be able to:

- State the different types of abortion
- Specify the causes of abortions
- Describe the management of at least three types of abortion
- Describe signs and symptoms of ruptured ectopic
- Describe the management of ruptured ectopic

Bleeding in Early Pregnancy

Vaginal bleeding in early pregnancy refers to any bleeding per vagina that occurs before the 28th week of pregnancy. In the early months of pregnancy, bleeding may be due to a number of factors or conditions.

Name three conditions that cause bleeding in early pregnancy.

Did you think of any of the following conditions?

- Abortion
- Ectopic pregnancy
- Hydatidiform mole
- Chorion carcinoma

As you may know, the most common cause of bleeding in early pregnancy is abortion. Abortion accounts for 95% of all bleeding in early pregnancy, whilst all the others account for only 5%. The last two, that is hydatidiform mole and chorion carcinoma will be discussed in the last section of this unit.

Abortion

Abortion is defined as the loss or expulsion of the foetus before the 20th week of pregnancy. Abortion is significant not only because of the loss of a wanted pregnancy, but because it is a major cause of maternal death from the haemorrhage and sepsis that may follow a mismanaged abortion.

The definition of abortion generally accepted for legal purposes is 'the delivery of a foetus at less than 20 weeks gestation or with foetal weight of less than 500gm'.

Many people tend to look upon abortion as pregnancy that has been terminated criminally and miscarriage as a spontaneous occurrence. As a result, abortion is stigmatised, however, the two are the same thing.

Causes of Abortion

The causes of abortion are many and are divided into maternal, foetal and miscellaneous causes.

Maternal causes of abortion account for about 25% of the known cases of abortions and they include the following:

- General diseases like hypertension or chronic heart disease.
- Acute febrile illnesses, for example, malaria, acute pyelonephritis, pneumonia.
- Endocrine disorders, for example, thyrotoxicosis, poorly controlled diabetes mellitus.
- Local conditions such as under development of the uterus, fibroids and congenital abnormalities of the uterus. The fibroids can cause abortions, especially if they are submucous or deeply intramural. The congenital abnormalities of the uterus include a septate uterus and a bicornuate (uterus divided into two) uterus.
- Cervical incompetence which may be due to either congenital weakness of the circular muscle fibres of the cervix, or previous splitting of the cervical sphincter due to obstetrical trauma, or high amputation of the cervix due to cervical lesions.

Foetal causes of abortion account for about 75% of the known cases and they often result in early abortion, that is, first trimester abortions. Foetal causes may be due to:

- Chromosomal or genetic abnormalities.
- Abnormal attachment of the placenta, that is, defective implantation or activity of the trophoblast.

In addition to maternal and foetal causes, there are those that are grouped as

miscellaneous causes. These include:

- Accidents, for example, falls, and injuries. The incidence of abortion among these cases varies enormously from individual to individual after the accidents.
- Criminal interference, using various instruments, local herbs and plastic catheters, which are inserted into the cervical canal.
- An Intrauterine Contraceptive Device (IUCD). An abortion, especially in the second trimester can occur if conception occurs despite the presence of an IUCD. Note that ectopic pregnancy, antepartum haemorrhage, premature rupture of the membranes and manual removal of the placenta occurs more commonly in pregnancy with an IUCD. Therefore, the IUCD should be removed as soon as pregnancy is diagnosed.

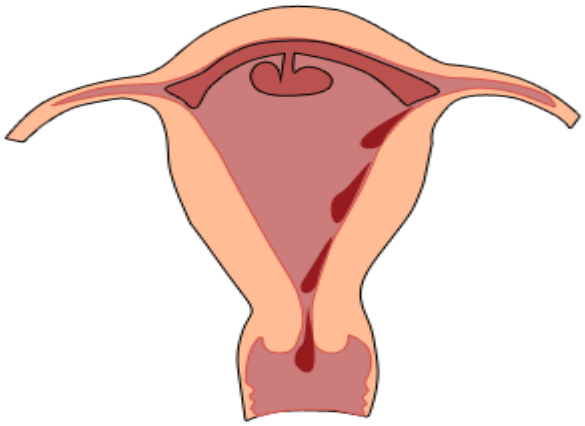
Most of these abortions occur in the first three months of the pregnancy, before the placenta is mature. Abortion is the detachment of the products of conception, which is accompanied by bleeding that may be profuse. Blood loss is accompanied by painful contractions of the uterus, dilation of the cervix and expulsion of the foetus and its membranes. Slight or even moderate bleeding does not, however, mean that the foetus is no longer alive. As a health worker you must do all you can to save life at all times.

Types of Abortion
As you can see there are many different types of abortion.

- Threatened Abortion
- Inevitable or Imminent Abortion
- Missed Abortion
- Habitual Abortion
- Septic Abortion
- Induced Abortion

Now move on to look at the different types of abortions and how they are managed.

Threatened Abortion
The patient with threatened abortion will have slight vaginal bleeding and abdominal discomfort. When you examine her you will find the os of the cervix closed.
While many patients will successfully carry this type of pregnancy to term, others may not. It is essential, therefore, to make the patient realise that nothing can be done to prevent an abortion.



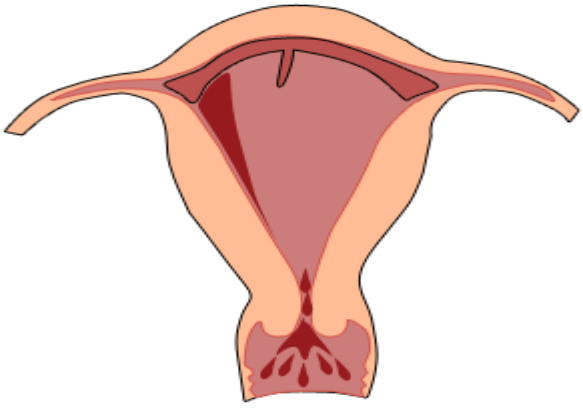
Threatened Abortion Slight placental separation, slight bleeding, os closed.

Here are some essential measures to take:

- Reassure the patient that, if she continues with the pregnancy, the foetus will not be at greater risk of abnormalities and that it will continue to grow just like in a normal pregnancy.
- Ensure bed rest and allay anxiety (of losing the pregnancy) by administering tabs. Phenobarbitone 30 to 60 mgs tds, morphine 10 mgs or pethidine 100 mgs. If the pain is stronger, some doctors may use progesterone.
- Warn the patient to notify the medical team if the cramps become worse or the bleeding becomes heavy.
- Ask her to save the pads as well as any tissue or clots that she might expel, for examination.
- Advise her to take a low residue diet and avoid aperients and enema because this will stimulate the contractions.
- Advise her to remain in bed for at least three days after the bleeding stops.
- Advise her to avoid heavy physical activities and especially sexual excitement.

Remember:
Vaginal examination is NOT usually carried out because of fear of increasing uterine disturbance.

Inevitable or Imminent Abortion
Inevitable or imminent abortion means that nothing else can be done. The foetus must come out. The abortion becomes inevitable if, in addition to vaginal bleeding and abdominal discomfort, the uterine contractions become strong and painful and lead to dilatation of the cervix. This is followed by either complete abortion or incomplete abortion.
The primary measure taken is to save the life of the patient since there is often profuse bleeding, especially in patients who end up with an incomplete abortion. Take the patient's history to determine if the products of conception have been expelled.

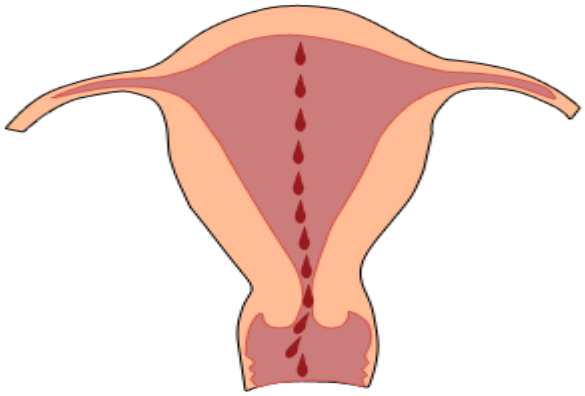


Incomplete Abortion Placenta and membranes are retained. Foetus is expelled.

Inevitable or Imminent Abortion
Many patients will come to the hospital due to severe bleeding, which means that the products of conception have been retained. Since there is essentially no chance of the pregnancy progressing any further under these circumstances, the uterus should be emptied immediately.

Remember:
Resuscitate all patients with shock first, before transferring them to a hospital.

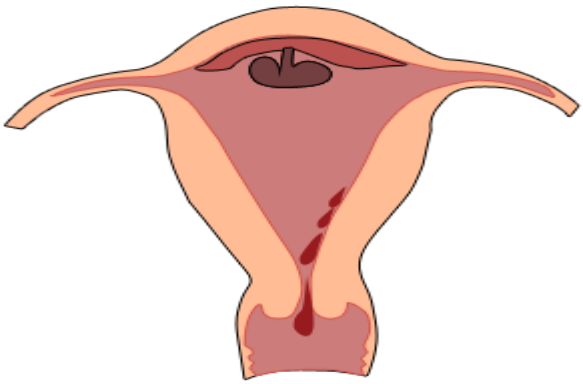
If the patient has excessive blood loss, hasten the evacuation by administering an oxytocic drug. Bleeding that does not cease after the expulsion of the products of conception will require administration of ergometrine 0.5mg stat. Take blood for grouping and cross-matching then fix a drip of plasma expanders or normal saline/Hartman's solution. Give a strong analgesic to relieve pain. Severe pain can lead to shock.



Complete abortion Placenta, foetus and membranes are all expelled.

Save anything passed per vagina to inspect if all products of conception have been passed. Observe infection prevention principles while performing vaginal examinations to remove any placenta tissues distending the cervix.
A finger or sponge forceps is used to remove the products of conception. Observe bleeding and if the temperature is normal after the evacuation of contents, the patient can be discharged.

Missed Abortion
This means that the products of conception are not expelled despite the signs and symptoms of abortion. It occurs when abortion is threatened but the bleeding ceases and all is apparently well, except that signs of pregnancy subside, breast activity stops, and the uterus does not grow bigger.
After some time (about eight weeks) a brownish discharge from the vagina appears. This shows that the foetus is dead but still in the uterus. It degenerates into a solid mass of mostly organised blood clot called a carneous mole. This mole will in time be expelled with little or no loss of blood. This may be hastened by the administration of ergot and stilbesterol by mouth. Refer all suspected cases of missed abortion to hospital for management as it may be necessary to carry out a surgical evacuation as well as to check the uterus for any abnormalities by performing
an ultrasound.



Missed Abortion Foetus is dead and there is retained placenta. There is also a brown vaginal discharge.

Habitual Abortion
This is when a woman has had three or more successive abortions. In the majority of cases, the cause is not obvious. Some of the known causes however, include the following:

- Chronic illness, for example, diabetes mellitus.
- Abnormalities, for example, septate uterus and cervical incompetence being the most common, especially in late abortions.
- Endocrine or genetic causes, especially if it occurs before 14 weeks.
- Infections, for example, syphilis.

In the management of this patient, the following is performed:

- Take history and carry out a physical examination to establish the cause.
- Deal with the causes that can be managed, for example, if it is syphilis then treat.

- Advise on proper dietary intake, together with thyroid and hormonal supplements (but not diethylstilbestrol or other oestrogens).
- Establish a therapeutic supportive relationship with the patient to help her overcome the loss of her pregnancy.
- Surgically correct the obvious abnormalities of the genital tract, like removal of myomas and repair of an incompetent cervix.
- Provide appropriate pre and postoperative care as for any other surgical patient.

Septic Abortion

In the past, this type of abortion was associated with the criminal interference of a pregnancy. However, it may occur in a spontaneous abortion, if there has been bacterial contamination. Septic abortion is usually caused by gram-negative Escherichia Coli (E. Coli) but sometimes gram-positive streptococci and staphylococci are also involved. In most cases, the infection is mild and limited to the uterus.

The infection may be limited to the tubes or it may spread to the peritoneal cavity and cause peritonitis. Severe E. Coli infection may lead to septicaemic shock due to endotoxins released by the organism, thus leading to total vascular collapse (death).

The patient will present with:

- Fever due to the infection
- Fast, rapid pulse rate due to the infection and fever
- Offensive smelling vaginal discharge
- Tender lower abdomen on palpation
- Bright red blood continues to be lost

The management will include:

- Resuscitating with intravenous fluids.
- Administering antibiotics, both broad spectrum and perinatally.
- Evacuating infected products of conception as soon as possible.
- Taking history with an emphasis on why the abortion was performed.
- Taking relevant specimens for investigation.
- Ruling out infection in other systems.
- Assessing urinary output to rule out renal function interference.
- Monitoring vital signs carefully since a high temperature and rapid pulse will indicate the severity of the infection.
- Taking cervical swab for culture and sensitivity in order to institute treatment according to the findings.
- Encouraging plenty of fluid intake in order to flush the system of the toxins and correct dehydration.
- Performing vulva toilet four hourly with antiseptic.
- Administering tetanus toxoid or anti-tetanus serum 0.5 mls for treatment.

Induced Abortion

Induced abortion is an abortion that is intentionally caused. It is commonly associated with young unmarried women, especially schoolgirls or even married women who get pregnant due to contraceptive failure. However, an induced abortion can also be performed for medical reasons.

There are two types of induced abortion: Therapeutic (which is performed on medical grounds) and Criminal (which is illegal).

According to medical ethics, a **therapeutic abortion** may be carried out only if two registered medical practitioners are of the opinion that the pregnancy should be terminated. There are two specific circumstances when this can be done. These are:

- If the continuance of the pregnancy would involve a risk to the life of the pregnant woman or of injury to her physical or mental health.
- If there is a substantial risk that the child, when born, would suffer from physical or mental abnormalities and be seriously handicapped.

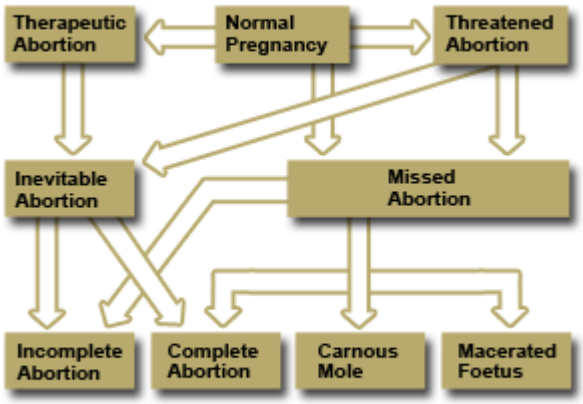
Criminal abortions are sometimes attempted by an unqualified person. The operation is often hurried and lacking asepsis. The complications of criminal abortions include:

- Haemorrhage.
- Sepsis, which is usually severe and can lead to septicaemia and endotoxin shock.
- Haemolysis and renal damage may occur secondary to the septicaemia.
- Injuries to the birth canal and pelvic organs.
- Sudden death due to extreme syncope as a result of dilatation of the

cervix and in some cases from amniotic embolism.

Remember:
According to the laws of this country, induced abortion is a criminal offence, unless it is done on medical grounds.

The illustration below shows the outcome of therapeutic and threatened abortions. Note that threatened abortions are usually spontaneous.



Post-Abortal Care (PAC)
PAC comprises the comprehensive health care provided to patients with problems of incomplete abortion. It has three interrelated components, which are:

- Emergency treatment of complications arising from spontaneous or induced abortion.
- Family planning counselling and services.
- Access to comprehensive reproductive health care.

These are the major components for PAC, which various health care providers/groups may provide.
You should ensure the control and prevention of cross-infection when performing procedures. Thus, it is important to remember the infection prevention principles, which you covered in the previous unit on Contraceptive Technology.

Care After Manual Vacuum Aspiration (MVA)
You should check the patient's vital signs, severe vaginal bleeding and general condition and allow the patient to rest comfortably.
Patients that have been treated should receive after care guidance, which includes:

- Explain/counsel patient before discharge that she will be at risk of repeat pregnancy for up to two weeks following treatment.
- Counsel her on a variety of safe contraceptive methods that can be used immediately to avoid pregnancy for the body to return to its normal state.
- Explain where and how to get family planning.
- Counsel on all available family planning methods to enable the patient to make an informed choice of family planning methods.
- Explain how to use the selected family planning method.
- Explain that family planning methods, other than condoms do not provide protection against STI/HIV/AIDS.

As mentioned on the previous page, patients that have been treated should receive after care guidance, which also includes:

- Informing her about symptoms that would require the patient to return immediately to the facility and the action she should take.
- Advising her on signs of recovery when normal menstruation may resume.
- Advising her on personal hygiene and when to resume sex.
- Providing the method of choice to the patient.
- Helping the patient to cope with the pregnancy loss.
- Allowing grieving.

Ectopic Pregnancy (Extrauterine Pregnancy)
Ectopic pregnancy is a condition in which the zygote becomes implanted in a place outside the uterine cavity. The most common site of ectopic gestation is inside one of the fallopian tubes and this is called a tubal pregnancy. The term ectopic is derived from a Greek word, which means 'out of place'.

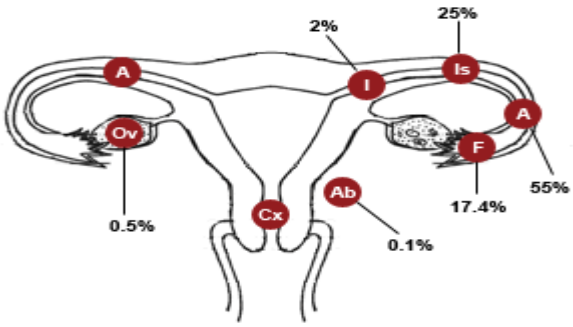
Can you remember the other sites where the zygote can implant outside the uterine cavity?

Did you remember the other less common sites?

- The ovary
- The cervix
- The abdominal cavity

The illustration below shows the different possible locations of an ectopic pregnancy with relative frequency occurrence.

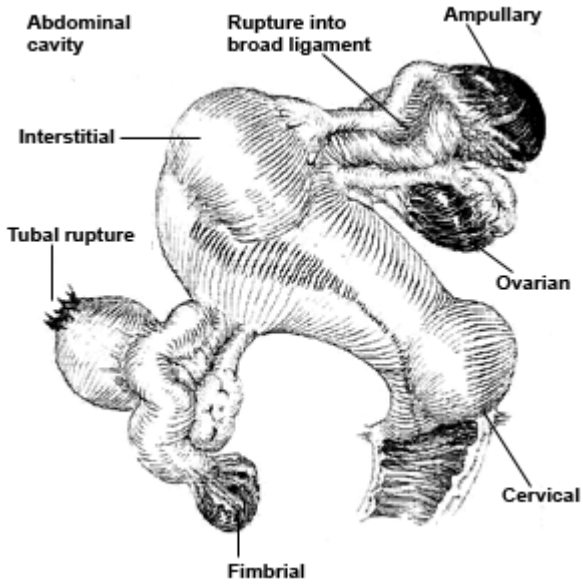
Key	
A	Ampulla
Cx	Cervix
F	Fimbrial
I	Interstitial
Ov	Ovary
C	Cornua
Is	Isthmus
Ab	Abdominal Cavity



The most common type of ectopic pregnancy is the tubal pregnancy, occurring in at least 55% of ectopic pregnancies. This type of pregnancy is common in the tropics because of the high incidence of blocked tubes due to gonorrhoea, puerperal and post abortal sepsis, and Pelvic Inflammatory Diseases (PIDs).

The ovum is fertilised in the fallopian tube but the zygote is unable to reach the uterine cavity because of loss of mobility and ciliary action. Therefore, the ovum may be arrested at:

- The fimbriated end of the tube, which is an uncommon site.
- The ampulla which is the most common site.
- The isthmus which is the most dangerous site because of the frequency of tubal rupture at about four to five weeks.
- The interstitial part of the tube in which rupture begins at second trimester. It is also an uncommon site.



In many African countries, including Kenya, ruptured tubal pregnancy is the most common surgical emergency in women. Consequently, it is very important that you know how this condition presents and how it is managed.

From the description of the types of ectopic pregnancies you can now easily identify their causes.

Some of the common causes of ectopic pregnancy include:

- Previous inflammatory process in the tube or acute PID, which will heal with scarring tissue and block the tube.
- Peritoneal adhesions secondary to previous surgery due to, for example, appendicitis, may cause occlusion.
- Endometriosis whereby the endometrial tissue is lodged in the tube and occludes the tubal lumen.
- Congenital anatomical irregularity often due to presence of diverticula of the uterine tube.
- Tubal surgery.

Pathophysiology of Ectopic Pregnancy

Once the implantation has occurred in the tube, the sequence of events associated with pregnancy follows. The corpus luteum remains and grows, producing progesterone, which

increases the thickness of the endometrium and ensures that it is not shed, so that the patient misses the period.
The tube is not, however, able to nourish the ovum for long and bleeding detaches the ovum. The ovum may be ejected into the peritoneal cavity through the fimbriated end. The onset of pain may be gradual or it may occur dramatically.

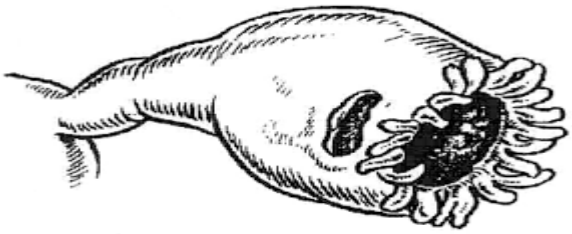
Symptoms and Signs of Ectopic Pregnancy
Unfortunately, an ectopic pregnancy causes very few symptoms until the foetus has become large enough to rupture the fallopian tube. This, therefore, makes it very difficult to diagnose an ectopic pregnancy before it ruptures. That is why it is very important that you refer a patient to hospital on the slightest suspicion of ectopic pregnancy.
The muscle wall of the tube does not have the capacity of the uterine muscle for hypertrophy and distension and tubal pregnancies nearly always end in rupture and the death of the ovum.

Before Rupture
You should suspect an ectopic pregnancy before rupture if a woman comes to you with the following complaints:

- Amenorrhoea of two or three months (common in about 80% of cases). The patient may sometimes present with a ruptured ectopic even before the expected date of the next period.
- Vague lower abdominal pain, which the patient might ignore. This is due to slight leakage of blood from the tube, which causes localised peritoneal irritation. It may also be due to the distension of the tube by the growing foetus.

On examination the patient is usually healthy. You might feel a slightly enlarged uterus or a mass on one side of the uterus.

Rupture into Lumen of Tube
Tubal Abortion



After Rupture
When the tubal pregnancy ruptures, usually after two to three months, the patient presents with the following complaints. For the acute type of rupture, also known as fulminating, they complain of:

- Sudden onset of low abdominal pain.
- Vomiting and fainting because of the sudden intraperitoneal bleeding.
- Vaginal bleeding, this may not develop until many hours after the rupture.
- If bleeding is rapid it may lead to hypotension and shock.

For the chronic leaking type, the patient complains of:

- Suffering for some time from abdominal uneasiness.
- Pain.
- Occasional fainting.
- Haemorrhagic slight bleeding.

Rupture into the
Peritoneal Cavity

The chronic rupture is the most common type of rupture of tubal pregnancy that you are likely to encounter. Unfortunately, in many cases, whenever health workers talk about an ectopic pregnancy, they only think of the acute type, that

is a woman who develops sudden severe abdominal pain and collapses.
You must remember that not all ectopic pregnancies present in the acute type. In fact, in clinical practice, some of these patients have been wrongly managed as either threatened abortion or acute pelvic inflammatory disease. That is why an ectopic pregnancy has been called 'the great deceiver'.

Remember:
Diagnostic errors of an ectopic pregnancy may be fatal.
Now move on to look at each of the two clinical types of ruptured ectopic pregnancy

Acute Rupture of Ectopic Pregnancy
A woman with acute ectopic pregnancy may present as discussed earlier with the following:

- Sudden onset of lower abdominal pain.
- Vomiting and fainting because of the sudden
  intraperitoneal bleeding.
- Vaginal bleeding, though this may not develop until some hours after rupture of the tube and the death of the foetus.

On examination you might detect the following signs:

- The patient is in agonising pain and is restless.
- She is sweating, yet her skin feels cold and her palms are wet.
- She yawns frequently as if hungry for air.
- The radial pulse is rapid, weak and thready. The blood pressure may be very low or unrecordable.
- The temperature is usually normal.
- The abdomen is very tender with muscle guarding. Signs of free fluid in the peritoneal cavity, such as a fluid thrill and shifting dullness, might be detected if the patient can tolerate the examination. However, the absence of these signs does not mean that there is no free blood in the peritoneal cavity as the blood might be in small amounts.
- A pelvic examination is very painful and it is difficult to palpate the organs properly so it is important that you remember to be very gentle.
- There is extreme pain on moving the cervix with the examining fingers, that is, the cervix is excitable.
- The uterus is often slightly enlarged and a tender mass might be felt on one side of the uterus.
- A tender mass may also be palpated in the pouch of Douglas if blood is clotted there. This is also known as pelvic haematocele.
- The patient is usually anaemic.

Remember:
A sudden, severe collapse with little or no warning signs generally occurs when the zygote is implanted in the isthmus and there may be no history of a missed menstrual period.

Differential Diagnosis of the Acute Ruptured Ectopic Pregnancy

A ruptured ectopic gestation may be confused with many other conditions such as acute pelvic inflammatory disease, rupture of a gastric or duodenal ulcer, fulminating appendicitis, torsion of the pedicle of an ovarian cyst, acute pyelonephritis and/or rupture of a corpus luteum with intraperitoneal haemorrhage.

Remember:
In abortion, bleeding usually precedes pain, while in ruptured tubal pregnancy pain almost invariably precedes bleeding.

Signs/Symptoms	Ectopic Pregnancy	Appendicitis	Salpingitis	Uterine Abortion
Pain	Unilateral cramps and tenderness before rupture	Epigastric, periumbilical, then right lower quadrant pain; Tenderness localising at McBurney's point; Rebound tenderness	Usually in both lower quadrants with or without rebound	Midline cramps
Nausea & Vomiting	Occasionally before	Usually precedes shift of pain to right lower quadrant.	Infrequent	Almost never
Temperature And Pulse	37.2 – 37.8^{0}C (99 – 100^{0}F) pulse variable: normal before rapid after rupture	37.2 –37.8^{0}C (99- 100^{0}F 100^{0}F) pulse rapid 99-100/min	37.2 - 40^{0}C 99-104^{0}F) pulse elevated in proportion to fever	To 37.2^{0}C is spontaneous and to 40^{0}C if individual (infected)
Pelvic Examination	Unilateral tenderness especially on movement of cervix; Crepitant mass on one side or cul-de-sac	No masses; Rectal tenderness high on right side.	Bilateral tenderness on movement of cervix; Masses only when pyosalpinx or hydrosalpinx is present	Cervix slightly patulous; Uterus slightly enlarged, irregularly softened, tender with infection
Laboratory Findings	WBC count raised; RBC count strikingly low if blood loss is large; Sedimentation rate slightly elevated	WBC count rarely normal; RBC count normal; Sedimentation rate slightly elevated	WBC count raised; RBC count normal; Sedimentation rate markedly elevated	WBC count normal, if spontaneous and raised if induced (infection); Sedimentation rate slight to moderately elevated
Menstruation	Some aberration; Missed period; spotting	Unrelated to menses	Hypermenorrhoea or metrorrhagia or both	Amenorrhoea then spotting then brisk bleeding

In the next sub-section you will study the symptoms and signs of chronic leaking ectopic pregnancy.

Chronic Leaking Ectopic Pregnancy

In this type of pregnancy, it is very important to note the clinical history of the patient. You should check for the following:

- Abdominal pain and uneasiness, where the pain is generally situated low down in the abdomen and, often, is more marked on one side. It is continuous and is not relieved by pressure, as is the case in intestinal colic. Sometimes the act of emptying the bladder initiates a bout of pain. In a few cases the patient

complains of a frequent inclination to go and pass stool.

- Amenorrhoea is usually present, with irregular vaginal bleeding, which is usually slight and often dark brown in colour. It is not uncommon to attribute this discharge to threatened abortion.
- Occasionally there is expulsion of a decidual cast, especially if the pregnancy has gone beyond two months. The patient will give you an impression that she had a miscarriage. In some cases the health worker may carry out an evacuation thinking the patient has experienced an incomplete abortion.
- Occasionally there is a feeling of nausea, vomiting and fainting attacks. Remember that sudden faintness is a characteristic symptom of ectopic gestation.

When you examine the patient you are likely to find the following signs:

- Anaemia of variable degrees.
- Rapid pulse.
- Normal or low blood pressure.
- General tenderness and guarding in the lower abdomen, which is more marked on one side.
- There may be a tender, firm mass in one of the iliac fossae.
- On vaginal examination you will feel a tender mass in one of the fornices.

Management of Ectopic Pregnancy

A patient with tubal pregnancy will require an emergency operation. The patient should be immediately referred to a hospital. Start an intravenous drip of normal saline before transferring the patient. During the transfer, ensure that you treat the patient for shock and administer analgesics like morphine or pethidine for the pain. Potential blood donors should accompany the patient to hospital where possible.

In the hospital, the following diagnostic tests may be performed:

- Ultrasonography.
- Culdocentesis whereby non-clotting blood will be aspirated from the cul-de-sac.
- Human Chorionic Gonadorophin (HCG), which involves urine testing.

Blood is taken for grouping and cross-matching and a blood transfusion is started. An emergency laparatomy is then performed to ligate the bleeders. The affected tube is usually removed by salpingectomy or salpingotomy, which involves making an opening in the tube.

It may be possible to give an auto-transfusion to a patient with a fresh rupture of a tubal pregnancy. Auto-transfusion involves scooping blood from the opened abdomen with a small gallipot and pouring it through a filter made of three or four layers of gauze into a sterile bowel or jug containing sodium acid citrate solution, which is an anti-coagulant. When 500ml of blood have been collected it is decanted into a sterile bottle, which is then set up on a drip that is already running. Sometimes the blood is aspirated directly from the peritoneal cavity into a plastic transfusion bag containing sodium citrate solution.

Auto-transfusion is not advisable if:

- The history of the patient suggests that heavy bleeding began more than 24 hours before the operation.
- The blood appears discoloured or haemolysed.
- There is an offensive odour when the abdomen is opened.

The advantages of auto-transfusion include:

- No risk of transmitting HIV.
- Blood is easily available and perfectly compatible.

However serious the patient's condition appears to be, this operation has an excellent success rate. Post-operatively, the patient should be managed in the same manner as for any other abdominal operation.

After surgical treatment, there are several potential outcomes.

- Another tubal pregnancy will occur in about 10% of the cases treated.
- Infertility develops in approximately half of the patients who have undergone surgery for the treatment of an ectopic pregnancy. Of these about 30% become sterile.
- Normal pregnancies are achieved in about half of patients who have one ectopic pregnancy.

SECTION 4: GENITAL DISORDERS AND INJURIES

Introduction

In this section, you are going to look at some disorders of the genital tract and injuries. They shall be explained under the following grouping:

- Vulva dystrophies and cysts
- Relaxation of pelvic support
- Traumatic disorders of the genital organs

Objectives

By the end of this section, you will be able to:

- Explain dystrophies and cysts affecting the genital tract
- State the causes and management of relaxation of pelvic muscles
- Describe the management and prevention of trauma to genital organs

Vulva Dystrophies and Cysts

Dystrophy refers to the defective nutrition of an organ or tissue, usually muscle. There are various types of dystrophies and these will now be explained in detail.

Atrophic Lesions

This is due to ageing when there is a decrease in endogenous oestrogen. Atrophic changes in the vulva skin and sub-dermal tissues usually occur after some years.

Lichen sclerosis is a systemic dermatological condition and the most common cause of atrophic dystrophy. There will be contractures of the vaginal introitus and the skin becomes thin, fragile and easily traumatised. Its chief symptoms include:

- Dysuria
- Pruritis
- Dyspareunia

The vulva is the skin surface most frequently affected, although the skin of the back, axilla and beneath the arms may also be affected.

Hypertrophic Dystrophies

Chronic irritation or vulvo-vaginal infection may result in benign epithelial thickening and hyperkeratosis. During the acute phases, as in diabetic vulvitis, the lesions may be red and moist, which provide evidence of secondary infection. The lesions may involve any portion of the vulva, adjacent thighs, perineum or perineal skin.

Invasive malignancies may also appear as white lesions of the vulvar skin. A biopsy should be able to detect whether malignancy exists or not. Periodic re-examination of specimen biopsies and the excision of more advanced lesions should be performed.

Management of Lesions

The atrophic lesions and hypertrophic dystrophy lesions are both treated in the same manner.

Pruritis, dyspareunia and urinary symptoms resulting from oestrogen withdrawal, respond to local applications of oestrogenic creams. Specific treatment should be administered for vaginal infections, if present.

Topical corticosteroids, for example, 0.01% fluocinolone acetonide cream has proved helpful in hypertrophic lesions. A mixture of 1% hydrocortisone and 2 to 3% testoserone three to four times daily has been found to be particularly beneficial in the treatment of lichen sclerosis.

Remember:

Warn the patient not to apply an excess of testosterone because it may cause systemic virilising effects in addition to an increase in hair growth.

Prognosis

In the absence of malignancy, the principal goal is to relieve symptoms, which mainly consist of pruritis.

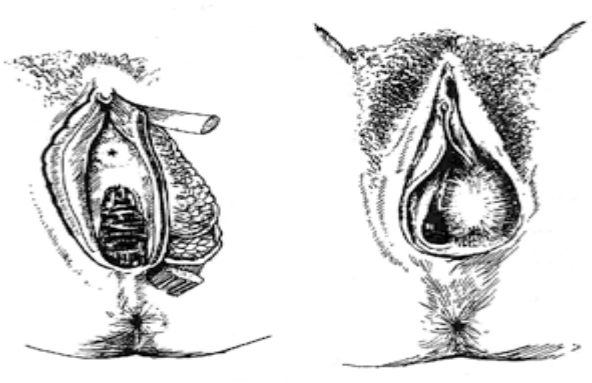
Periodic re-examination is also necessary to detect any malignant changes.

Bartholin's Abscess or Cyst

Can you remember where the Bartholin's gland is situated? See the illustration opposite to help you visualise it.

The most common cause of Bartholin's cyst is a gonococcal infection that causes obstruction. However, another probable cause is congenital narrowing of the duct. The patient will present with:

- Oedematous and inflamed tissues around the Bartholin's gland
- Fluctuant mass, usually palpable
- Small non-inflamed cysts are asymptomatic unless progressive enlargement compromises the vaginal introitus or acute infection intervenes

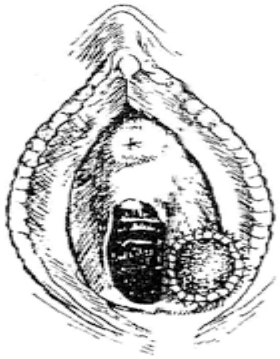


Treatment of Bartholin's Cyst

The main treatment for this condition is Incision and Drainage (I&D) of the infected cyst or abscess and preferably marsupialisation, which allows the abscess to drain properly thus preserving the function of the gland. The drained pus should be sent for culture and sensitivity to detect any gonococcal infections.

The patient should be put on appropriate antibiotics.

Do not forget this condition is very painful, which means the patient should also be given analgesics.



Relaxation of Pelvic Support

There are three muscles in the pelvic floor known as:

- The iliococcygeus
- The pubococcygeus
- The puborectalis

In addition, the perineal body is made up of bulbocavernosus muscles and superficial transverse perineal muscles. The two muscles insert into the midline of the perineum, posterior to the vaginal introitus and anterior to the rectum.

The lower rectum and vagina are supported by the bulbocavernosus. The urethra, vagina and rectum are supported by the endopelvic in the middle of the pelvis.

The cardinal ligament and uterosacral ligaments assist in suspending the uterus and adjacent organs so that they do not prolapse whenever there is increase in intra-abdominal pressure.

Excessive stretching and trauma may result in tears of the endopelvic fascia. This allows the base of the bladder to drop posteriorly forming a cystocele. Subsequently the urethra falls away from its normal position behind the symphysis pubis and forms an urethrocele.

The fascial support in the pelvis of Caucasian women seems to be more susceptible to being damaged than that of oriental/black women for reasons that are not yet well understood.

Now move on to look at three conditions that are related to relaxation of the pelvic support. These are cystocele, rectocele, and uterine prolapse.

Cystocele

This is the herniation of the bladder through the anterior vaginal wall. It may be classified into the following degrees:

- Mild cystocele, where the anterior vaginal wall prolapses to the introitus upon straining.
- Moderate cystocele, where the vaginal wall extends beyond the introitus upon straining.
- Severe cystocele, where the vaginal wall extends beyond introitus in the resting state.

A small cystocele will generally cause no significant symptoms but if it is a large one, the following symptoms may be noticed:

- It will bulge out of the vaginal introitus and make the patient complain of vaginal pressure or it may manifest as a

protruding mass that may give her feeling that she is 'sitting on a ball'.
- Symptoms are aggravated by vigorous activity, prolonged standing, coughing, sneezing or straining. They are relieved by resting and assuming a recumbent or knee-chest position.
- Urinary incontinence or incomplete bladder emptying feeling which may lead to frequent micturition.

Management of Cystocele

The management of a patient with this condition will include investigations using urinalysis, x-ray and/or cystoscopy. If the patient is suffering from a small or moderate cystocele, she should be reassured that it is not a serious condition. A woman of childbearing age should not have corrective surgery until she has borne her children. She will need conservative management, which will include:

- The insertion of a pessary or tampon in the lower part of the vagina, which may provide temporary support. However note that prolonged use may eventually lead to pressure necrosis and vaginal lacerations.
- Exercises in young patients will give definite improvement of pressure symptoms.
- Oestrogen in post-menopausal women for a number of months may greatly improve the tone, quality and vascularity of musculo-fascial support.
- Surgical measures especially for large cystoceles, causing retention and recurrent bladder infection. The most common measure is anterior-vaginal colporrhaphy, which ensures the most effective surgical correction of a cystocele. By preventing further pregnancies, a hysterectomy averts the problem of vaginal delivery, which would destroy the bladder support provided by the anterior colporrhaphy.

Prevention of Cystocele

- A woman should do intrapartum and postpartum exercises, especially those designed to strengthen the levator and perineal muscles groups.
- Correct or avoid obesity, chronic coughs, straining and traumatic deliveries.
- Oestrogen therapy maintains the musculo-fascial tissue after menopause and prevents or postpones the appearance of cystocele and other forms of pelvic relaxation.

The prognosis for recovery is excellent after surgery in the absence of subsequent deliveries or stress that increases intra-abdominal pressure.

Rectocele

This is the herniation of the rectum through the posterior vaginal wall. Some of the causes of this condition include:

- Disruption of the fibrous connective tissue (recto-vaginal fascia) between the rectum and vagina during childbirth.
- Operative deliveries, especially of a large foetus or breech delivery.
- Slow involutional changes in the pelvic musculo-fascial supporting tissues as a result of menopause.
- Bowel habits whereby lifelong chronic constipation with straining at stool causes this condition.

Remember:
Early and adequate episiotomy reduces the amount of damage to the recto-vaginal fascial supporting tissues.

Clinical Diagnosis

A small rectocele is usually demonstrable in virtually all multiparous patients and usually causes no symptoms but the following are essentials of diagnosis:

- Difficult evacuation of faeces.
- Sensation of vaginal fullness expressed as 'falling-out' pressure.
- Presence of soft, reducible mass bulging into lower half of the posterior vaginal wall, frequently a flat lacerated perineal body.

Management of Rectocele

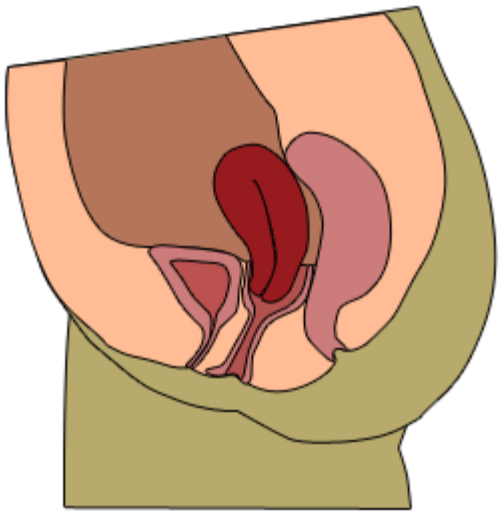
The management of this condition will include digital extraction if there is faecal impaction. In the long term, it is advisable to wait until the woman has had all the babies she wants in order to intervene especially for rectocele causing symptoms. Surgically, posterior colpoperineorrhaphy is usually curative. To

ensure permanent integrity of the rectocele repair, the patient should be advised to avoid straining, coughing and other strenuous activities and prevent constipation through a proper diet, plenty of fluid intake and the use of stool softening laxatives and lubricating suppositories.
Recurrence of the condition after adequate repair is uncommon if chronic constipation has also been corrected. Subsequent vaginal deliveries should be avoided, hence pointing to the need for elective Caesarean section.

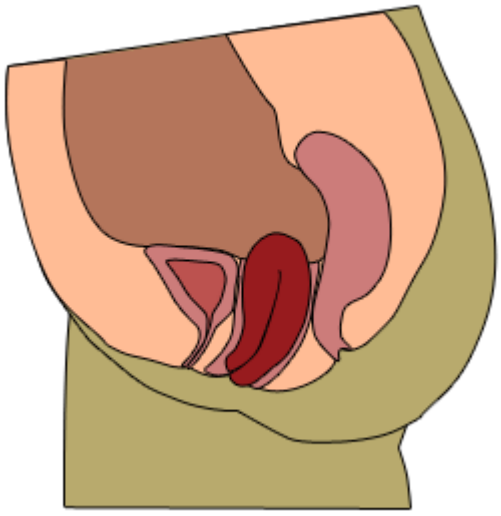
Can you think of any complications that may arise from rectocele and cystocele?
Some of the complications that may arise from rectocele and cystocele include:

- Leukorrhoea or increased vaginal discharge.
- Abnormal uterine bleeding.
- Abortion as a result of infection or disordered uterine or ovarian circulation in the prolapse.
- Urinary tract infection is common with prolapse because of the cystocele and urethra obstruction with hydronephrosis.
- Haemorrhoids due to straining with constipation, especially with rectocele.

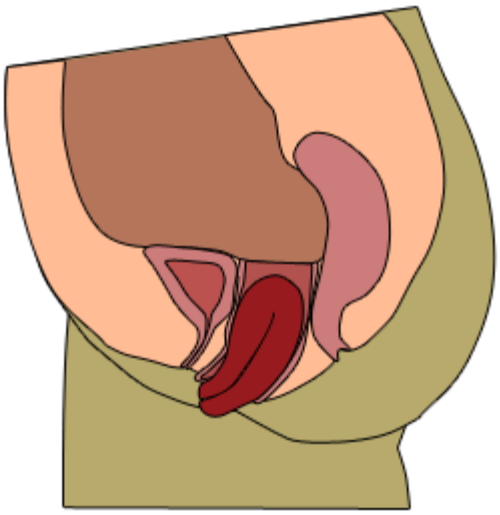
Uterine Prolapse
A uterine prolapse is the abnormal protrusion of the uterus through the pelvic floor aperture or genital hiatus. Uterine prolapse can be classified into the following degrees.



First DegreeSlight descent of the uterus. Cervix remains within the vagina.



Second Degree Cervix projects beyond the vulva when the patient strains.



Third degree (procidentia) The entire uterus has prolapsed outside the vulva

The most likely causes of uterine prolapse will be:

- Uterine prolapse occurs most commonly in multiparous women, like the cystocele and rectocele conditions with which it is usually associated.
- In Caucasian women, it occurs as the result of gradually progressive injuries to the endopelvic fascia due to childbirth and lacerations of muscles, especially the levator muscles and those of the perineal body.
- The condition may also be the result of pelvic tumour, sacral nerve disorders, especially injury to the S1-4, diabetic neuropathy, caudal anaesthesia accident and pre-sacral tumour.

Additional factors promoting uterine prolapse include systemic conditions like obesity, asthma, chronic bronchitis and bronchiectasis. Also important are local conditions like ascites, large uterus and ovarian tumours. A congenital type is seen in newborn infants during vigorous crying or vomiting (this type is common among the Pokot in Kenya).

A uterus that is in retroverted position is especially subject to prolapse. Prolonged labour may play a causal role and the condition is said to be more common amongst those who lead a largely sedentary life, usually with individuals who are immobile and/or obese.

Clinical Findings of Uterine Prolapse

Symptoms of uterine prolapse include:

- Pelvic pressure manifested by sensation of fullness in the vagina.
- Low backache.
- Uterus may protrude between the labia.
- Cervix may become eroded and may bleed due to drying effect on mucous membrane, especially in the third degree.
- Firm mass palpable in the lower vagina.
- Patient complains of dyspareunia due to trauma on the cervix during coitus.
- Leukorrhoea due to uterine engorgement.
- Compression and distortion of the bladder by the displaced uterus and cervix may lead to accumulation of residual urine, which leads to urinary tract infection, urgency and dribbling of urine due to overflow incontinence.

Can you think how the problem of uterine prolapse can be prevented?

Did you remember these points? You will need to do or advise mothers on the following:

- The importance of pre-natal and postnatal 'Kegel' exercises to strengthen levator muscles.
- The need for early and adequate episiotomy during the second stage of delivery.
- Traumatic deliveries should be avoided at all cost.
- Prolonged oestrogen therapy for menopausal and postmenopausal women tends to maintain the tone and integrity of the endopelvic fascia and pelvic floor musculature, and can therefore, act as a preventive measure.

Management of Uterine Prolapse

This should include surgical measures as well as investigations on the haemoglobin level, blood group, urea and urinalysis to detect any other abnormalities and also as a preparation for surgical intervention. Give the patient antibiotics and dressings, especially for third degree cases, after which a vaginal hysterectomy may be performed. For first and second degree cases, and for women of a reproductive age, Manchester repair is carried out. This entails colporrhaphy and amputation of the cervix.

Medical measures will include:

- Vaginal pessaries (inflatable doughnut) as a palliative measure if surgical treatment is contra-indicated or as a temporary measure to mild to moderate prolapse.
- Oestrogen therapy (systemically or vaginally) administered to post-menopausal women to improve the tissue tone.
- Dilatation and curettage may be necessary to investigate for malignancy if there is bleeding.
- Vaginal creams and/or medicated tampons may be useful.
- Urinary tract infection or cardiovascular complication should be treated appropriately.
- Enema or laxatives should be prescribed to help with constipation.
- Obese patients should be advised to try and lose weight.

Prognosis of Uterine Prolapse
Vaginal hysterectomy with anteroposterior colporrhaphy provides excellent and permanent vaginal support and if good healing occurs, preservation of vaginal functions as well. Recurrence may result from unrepaired cystocele and rectocele or from occupational factors such as heavy lifting or straining.
You will now move on to the final part of this section and look at traumatic disorders of the genital organs.

Traumatic Disorders of the Genital Organs

Injury to the genital organs may be as a result of gynaecological or obstetric surgery. Fistula may occur due to direct or indirect occlusion, as a result of angulation or obstruction.

Vulva
Injuries may be in the form of bruises or lacerations. These will heal by themselves as long as hygienic measures are observed.

Perineum
The injuries here may include primary tearing involving vaginal mucosa, secondary tearing involving vaginal mucosa plus skin, or third degree tearing involving vagina mucosa, skin and muscles.
Tears are usually termed as 'fresh' within 24 hours of occurrence and can be repaired. After 48 hours they are deemed 'old' and they cannot be repaired until healed.

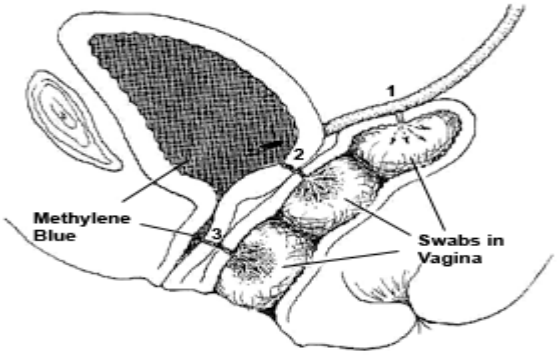
Vagina
The injuries to this organ may be bruises or lacerations. If oozing is present, then a vaginal pack is required. Alternatively, the vagina may have to be repaired.

Cervix

Injuries here may be in the form of bruises, lacerations and/or tears. Bleeding which is oozing or active will need a vaginal pack. For tears with active bleeding, the area should be repaired under general anaesthesia because unrepaired tears will lead to cervical incompetence causing mid-trimester abortion.

Uterus
The uterus can be perforated as a result of poor technique of IUCD insertion or dilatation and curettage. The rupture may be either partial or total. It can be repaired if perforated or partially ruptured but with total rupture, a sub-total abdominal hysterectomy is required.

Fistula
Fistula means 'a pipe'. It is defined as an abnormal, winding opening between two internal hollow organs.
The most common areas in the genital tract that may be connected abnormally are:
Vagina to bladder - Vesicovaginal Fistula (VVF)
Rectum to vagina - Rectovaginal Fistula (RVF)
Urethra to vagina - Urethrovaginal (UVF)
Urinary fistula however, can occur at many sites.
Study the illustration opposite.



Some common causes of fistula include:

- Obstructed labour due to pressure by the presenting part, causing necrosis. This accounts for 85% of cases in developing countries.
- Radiation therapy for gynaecological conditions, which accounts for 15% of cases (usually many years after treatment).
- Disease processes, such as carcinoma in advanced stages of the neighbouring organs.
- Chronic tuberculosis or syphilis.
- Congenital fistula, that is, an accessory ectopic ureter, which may open into the vagina. This condition can be recognised in childhood.

The main symptoms and diagnosis of VVF include:

- The patient keeps on complaining of constant dribbling of urine from the vagina and generally does not pass any urine by the normal route.
- On inspection with Sim's speculum, the fistula is situated in the midline half way up the anterior vaginal wall. This usually occurs as a result of prolonged labour. Postoperative fistulas are generally higher up.
- Small fistulae admit a probe with difficulty, but may be seen on cystoscopy. Large fistulae admit one or two fingers.
- Coloured fluid (methylene blue) runs into the bladder through a catheter and immediately flows out into the vagina.

This condition may also affect the individual patient in different ways. Some patients report that they do not experience any sexual enjoyment. In addition, there is the possibility of psychogenic amenorrhea and vulval excoriation with urine. The individual may feel like a social outcast.

Rectovaginal Fistula (RVF)

Most of the rectovaginal fistula are as a result of unrepaired third degree lacerations of the perineum and posterior vaginal wall, or repairs that have broken down so that an opening is left from the rectum into the vagina. Advanced cancer of the rectum or vagina can also cause RVF but this is rare.

Common symptoms of RVF include:

- With small fistulae, only mucus from the rectum may leak into the vagina. If the fistula are larger, faeces and flatus escape into the vagina.
- The patient will complain of feculent vaginal discharge.
- An inspection of the posterior wall of the vagina and the use of a probe will demonstrate the smaller fistula.
- Perineal excoriation due to leakage of urine and faecal matter.
- Symptoms may also depend on the site of the fistulae. If on the lower half of the vagina there is incontinence, flatus, or fluid faeces while if on the upper half there is continuous passage of faeces per vaginum.

Management of VVF and RVF

First and foremost, prevention is easier than cure. In most cases fistulae formation can be avoided by:

- Ensuring that labour does not go beyond 12 hours.
- Frequent emptying of bladder or catheterisation during normal labour since a distended bladder is easily traumatised by the pressure of the presenting part, especially in cephalic presentation.
- Control of infection and excoriation (use of infection prevention principles).
- In the event of destructive delivery due to prolonged labour, catheters should be left in situation for 48 hours to seven days.
- For VVF, recently formed fistulae will heal if the bladder is drained continuously for 21 to 28 days and for RVF, a low residue diet should be given for the same period.

Where surgery is indicated, it is important that fresh VVF is repaired at once. However, if it is only noticed some days after the injury, then two to three months should be allowed to elapse before the repair. This allows local damage and infection to settle and urinary infection to be eradicated. Most VVF can be closed by an operation via the vaginal route.

In the management of a patient who is due for surgical correction the pre-operative care will include:

- Blood for haemoglobin level, urea, Intravenous Pyelography (IVP) for ureteric fistula.

- Examination Under Anaesthesia (EUA) to detect the type of fistulae.
- Dye test (methylene blue) into the bladder to detect site of fistulae.
- Nursing care, including proper nutrition to ensure fitness for the operation.
- The woman will need a lot of encouragement and support since it can be a very distressing time.

After surgical correction, the following specific care should be given:

- Great care should be taken to secure constant drainage of the bladder to enable the repair to heal well. The catheter should remain in situ for 10 to 14 days.
- Relieve discomfort, give analgesics.
- Prevent infection by giving prescribed antibiotics.
- Ensure proper nutrition with increased intake of vitamin C and proteins but low residue.
- Ensure maintenance of local cleanliness through douching, enema and warm perineal irrigation.
- RVF is repaired after a course of antibiotics to reduce bowel infection.
- Also sterilise the gut with tabs cabbracol 500gm BD for five days.
- Give enema on the morning of the operation.
- After the operation, the patient should be placed on a liquid diet for two weeks.
- Liquid paraffin 10ml tds for two weeks, followed by analgesics and broad spectrum antibiotics.

Together with the above, ensure that you provide other general postoperative care, for example, regular observation and personal hygiene.

Remember:

Once the fistula is repaired, the patient should always opt for elective caesarean section delivery.

SECTION 5: INFERTILITY AND CLIMACTERIC CRISIS

Introduction

This section covers both infertility and climacteric crisis and the menopause in women. The Kenyan government, in its policies and guidelines on reproductive health, includes infertility and climacteric problems as components of reproductive health in essential obstetric care.

Objectives

By the end of this section you will be able to:

- Describe infertility and climacteric crisis
- Specify causative factors of infertility
- Describe the management of infertile couples
- Specify climacteric symptoms
- Describe the management of a woman who presents with menopause

Infertility

Most normal couples achieve a pregnancy within a few months of trying. However, failure to do so after one year may be arbitrarily defined as infertility, provided that normal intercourse is taking place not less than twice a week. But what is the difference between infertility and sterility?

- Infertility is 'the inability to achieve a pregnancy or to carry a pregnancy to term after one year of unprotected intercourse'.
- Sterility is 'the inability to produce offspring, i.e. the inability to conceive (female sterility) or to induce conception (male sterility)'.

There are two types of infertility; primary and secondary. In primary infertility, no conception has taken place at all. In secondary infertility, there may have been some conception even if it ended in a spontaneous abortion.

There are several causes of infertility, which will be covered here under three broad categories - general factors, female factors and male factors.

General Factors Affecting Fertility

Age

In the female conception occurs at any time after menarche and before menopause. It is rare in the first few cycles and the last few cycles

before menopause because the cycles are usually anovular.
Fertility in women is at its height in the late teens and early twenties. It declines slowly after 30 years of age. In the male, spermatogenesis commences actively at puberty and continues throughout life but ageing reduces fertility to a variable extent.

Health and Nutrition
Good health is associated with fertility but bad health is not an absolute barrier to conception, except when ovulation and spermatogenesis are directly affected.
Deliberate dieting (condition known as anorexia nervosa) will lead to loss of weight, which in turn will lead to amenorrhea, hence failure to ovulate.
On the other hand, sometimes obesity and infertility seem to be connected in women, probably because obese women ovulate and menstruate less frequently.
Chronic alcoholism or drug addiction may also lead to infertility. For example, morphine tends to depress ovarian activity.

Psychological Factors
Anxiety and tension seem to be responsible for infertility in some individuals. They manifest through changes in the neuroendocrine control of ovulation.

Female Factors Affecting Fertility
Some of the causes of infertility in females include:

- Congenital, also known as Mullerian agenesis, where there is no uterus or ovaries. Another factor is vaginal atresia, which is the narrowing or stenosis of the vagina.
- Infections leading to tubal blockage, for example, sexually transmitted infections (gonococcal, chlamydia), tuberculosis, salmonella, enterobias vermicularis and postabortal or puerperal sepsis.
- Endocrine due to pituitary adenoma with increased prolactin leading to inappropriate galactorrhoea which is associated with amenorrhoea and anovulation. Hormonal imbalance with increased oestrogen will lead to endometrial hyperplasia hence irregular period (metropathia haemorrhagica) or prolonged periods and cycles. Hypothyroidism is generally associated with infertility.
- Diabetes mellitus, if uncontrolled or in those with severe complications may impair fertility.
- Uterine fibromyoma, especially if it is large enough to distort the uterine cavity or block interstitial parts of the tube, may also cause recurrent abortion.
- Cervical hostility, whereby the cervical mucus is unreceptive to spermatozoa and either prevents their progressive advance or actually kills them. It may be due to infection or the presence of sperm antibodies.
- Cervical incompetence is almost always a cause of mid-trimester abortion and will lead to secondary infertility.
- Endometriosis because of the menorrhagia may lead to infertility.

Male Factors Affecting Fertility
The following factors in the male may lead to infertility.

- Congenital, for example, hypospadias (ventral external urethra meatus) where the opening is congenitally malformed.
- Undescended testes, where the testes either remain in the abdominal or inguinal canal or are retractile, that is, tend to go back in the abdomen. Take note that the temperature of scrotal contents is about 1° Centigrade below the normal body temperature. Spermatogenesis is impaired if the temperature of the testes is raised and this is often the case with undescended testes. The temperature can also be raised by frequent hot baths, the use of thick, tight underclothes as well as living at high altitudes for too long.
- Infections of bacterial origin, for example, gonococcal chlamydia will block the vas deferens after healing with scarring. Viral infection, especially mumps, can cause orchitis, interfering with spermatogenesis. Therefore, a male child suffering from mumps should be observed keenly for this complication.
- Auto-immune problems whereby the cervix can be hostile to the sperm of a man and produce antibodies.
- Impotence where there is no erection for unknown reasons.

- Ignorance of coitus and in some cases excessive coitus.
- Less sperm count (oligospermia) or no sperms at all (azoospermia).
- Endocrine disorders, for example, pituitary failure, adrenal hyperplasia or thyroid deficiency.

Remember:
Examine every newborn male at birth to detect undescended testes in order to prevent the problem of infertility later.

Management of Infertility

Infertility is a very stressful condition with a continuous cycle of hope and disappointment. Life centres around trying to conceive a baby and nothing else seems important. Partners blame each other and become frustrated and guilty. Patients should be managed by a gynaecologist, whose scope of intervention will depend on the services or technology available.

The couple should be investigated based on their general reproductive history. Clinical examination of each partner is carried out separately and any worries should be elicited and confidential information obtained from each partner.

In the male partner the following should be done. Take a history of sexual function, erection and ejaculation. Any past history of orchitis or STDs should be noted. It is important to establish how often intercourse takes place, whether there is any experience of difficulty in either partners, discomfort or lack of satisfaction (the male orgasm which brings about ejaculation of the semen is essential for fertilisation).

A clinical examination should also be done and should include an assessment of the size and consistency of the testes and epididymis on each side. You should also assess for the presence or absence of varicocele or hernia and the size of the prostate. Plan for action after the initial history and examination will include semen analysis. This should normally be the first step in an investigation because if there are no sperms present in the semen, it is pointless to investigate the female.

Prior to semen analysis, in preparation to collect specimen, the man abstains from coitus for three to five days and a masturbation specimen is then collected. It should be received in the laboratory within half an hour. In semen analysis, examine colour (if sturdy, then it is infected), viscosity, bacteriology (if pus cells present), motility (progressive, sluggish or no movement), morphology (the ideal is 50%) and sperm count (40 to 370 million sperms per cc). Note that in Kenya 20 million is considered an acceptable
sperm count.

If the serum contains sperm antibodies, the spermatozoa become immobilised when they come into contact with the cervical mucus. The test should be done three times. Once the seminal fluid analysis has been done and found to be normal, then the next step is to test for ovulation and tubal patency in the female.

In the female partner, attention should be paid to any endocrine abnormality. A routine pelvic examination should also be performed. During history-taking, the following should be ascertained:

- Any illness which might have caused peritonitis, for example, tuberculosis. This could mean the tubes were also affected.
- Menstrual history, for instance, whether menstruation is scanty or irregular. Any abortion or sicknesses should be noted.
- Outcomes of previous pregnancies should also be noted.
- Marital history, including duration of marriage and how long she has been trying to become pregnant.

The plan of action after taking down the patient's initial history and examination should include a Hysterosalpingography (HSG), which remains a useful investigation for tubal patency. A laparoscopy plus dye test does not only allow assessment of tubal patency but also gives proof that the tube is normal in appearance, the fimbriae are healthy and that the tubal movement is adequate.

Ovulation may be confirmed in several ways, including the temperature method, the examination of cervical mucous, progesterone level on blood sample taken one week before a period is expected (day 21 of 28 day cycle) and a level of more than
20 mmol/L, which confirms that ovulation has taken place. An ultrasound may detect follicular growth and ovulation. A histological examination of the endometrium should also be performed just before menstruation in order to assess the response to progesterone secretion by corpus luteum and to exclude tuberculosis.

Treatment of Infertility

Not all couples that complain of infertility need to be investigated and treated. For short periods of infertility in a young couple, simple clinical assessment and reassurance that they appear normal is all that is required. Emphasise to the couple that if no abnormality is found, that pregnancy is always possible even after many years.

Treatment may take several forms. A detailed outline of ovulatory failure was covered earlier in section two. Tubal blockage can be treated by salpingolysis, which is the most successful tubal operation and consists of dividing peritubal adhesions around the ampullary ends of the tube.

Salpingotomy involves making an opening into the distal end of a hydrosalpinx and is usually better for fimbrial blockage. In tubal anastomosis, blockage, the isthmic portion is excised and the cut ends anastomosed.

During in vitro fertilisation, the oocytes from the mature ovarian follicle are retrieved, fertilised with the partner's sperm and the developing embryo is replaced into the woman's uterus.

In the male there are also various forms of fertility treatment, depending on the specific condition. Semen problems, such as azoospermia, secondary to lack of gonadotrophic stimulation, are curable by the administration of Human Menopausal Gonadotrophin (HMG). However, there is no treatment for azoospermia due to congenital anomalies or chromosomal abnormalities.

Synthetic androgens, for example, mesterolone (proviron), have a direct action on spermatogenesis. They should be administered at a dose of 50 mgs daily for three months.

Oligospermia will often respond to an improvement in the patient's general health and fitness, therefore, exercise and a good diet should be encouraged. The patient should also be advised to avoid excessive consumption of alcohol, tobacco and caffeine. Additionally, the excision of varicocele, if present, is commonly done for oligospermia.

Artificial Insemination (AIH) with the partner's semen is widely used for infertility due to impotence or anatomical abnormality in the male, especially in cases of hypospadias, which prevents normal ejaculation of sperm into the upper vagina.

You should also counsel the patient on general measures that may be helpful like refraining from excessive coitus, obtaining adequate sleep, weight-loss advice for obese patients and the need to avoid excessive and prolonged exposure of the scrotum to heat by avoiding hot bath, tight underwear or prolonged sitting in hot environments.

Some of the problems infertile couples may face will include:

- Poor social standing that is, not having respect from friends, relatives and the community as a whole.
- The stress of infertility makes one be unproductive economically.
- Sexual disinterest due to dyspareunia.

The frantic effort of wanting children will complicate the infertility leading to domestic disharmony, separation and divorces and/or promiscuity which may increase the risk of STI/HIV.

As you come to the end of this sub-section, you will now be able to identify couples with infertility and assist appropriately. You have covered the predisposing factors in both sexes and looked at the investigations and appropriate management.

Climacteric Crisis

In women climacteric crisis is the period of menopause (while in males it is known as andropause).

Menopause is a period in a woman's life when menstruation ceases naturally. There is progressive ovarian failure, which is preceded by complete absence of menstruation. Menopause is declared after one year of no menstruation. A considerable number of women will undergo physical or emotional upsets but the majority will not be significantly affected.

To some, menopause is a threatening period that declares the end of their femininity, while to others it is a time when many former diseases or ailments recur. A few will see this process as witchcraft or untreatable disease. You should note that sexual desire is present in most women for many years after menstruation ceases.

Climacteric Symptoms

The climacteric symptoms occur as a syndrome. Menopausal syndrome refers to several symptoms related to hormonal imbalances in women. Menopause may occur without any symptoms other than the cessation of menstruation, but it is not infrequently associated with other symptoms. The most

common of these is the occurrence of hot flushes.
A hot flush is the flushing of the face and neck often with sweating. The flush may be only momentary or may last up to 15 minutes and recur many times a day. The flush occurs as a result of a rise in the peripheral blood flow (measured in the arm) and in the pulse rate, but no change in blood pressure. About 80 to 85% of women experience hot flushes. In Kenya these are often mistaken for malaria or typhoid.

Remember:
Flushes are particularly severe and abrupt when there is a change in the hormone balance, for example, after bilateral oophorectomy and, in men, after orchidectomy.

Climacteric Symptoms

Other symptoms include weight gain in some women, which is generally a result of low-level activity. Exercise tends to promote hormonal balance. Osteoporosis can also result and has been attributed to oestrogen deficiency.
Atrophic changes in the vulva will cause discomfort and dyspareunia. A decrease in vaginal acidity may allow organisms to survive and lead to vaginitis or endometritis (this occurs in a small number of women). This may be confused for STIs.

Remember:
Decrease in circulating oestrogen levels will lead to increased excretion of calcium in the urine. Calcium is essential in bone development.

Anxiety, irritability, insomnia and depression are often present in varying degrees and are seen mainly in women who have a history of psychological instability. Additionally, aches, pains, headaches, urinary urge and incontinence are often as a physical expression of anxiety and depression. Some women experience severe headaches for unexplained reasons.
Periods may cease abruptly or gradually diminish at the menopause. Although excessive and irregular blood loss is not uncommon at about the time of menopause, it must never be accepted as normal or 'just the change'.

Management of Menopause

The majority of women soon adjust to their new situation. This is especially true if they get support and understanding from their husband and family. For some, their problems may be severe enough to warrant them seeking medical advice.
Oestrogen may be administered to suppress hot flushes and this may, in turn relieve sleeplessness and also help the depression. Some preparations that can be used include equine combined oestrogen (premarin) 0.62 mgs daily or oestrogen valerate (progynoval) 1 mg daily.

For atrophic changes in the genital tract, Dienestrol cream can be applied locally. Some doctors may give the treatment for several weeks to relieve symptoms, then gradually reduce the doses before discontinuing the treatment.
Long-term therapy (as long as ten years) may benefit the patient in preventing this condition, but on the other hand, may induce endometrial carcinoma or enhance the growth of pre-existing carcinoma of the breast. Therefore, it should be established as far as possible that no such tumour is present when this therapy is employed. Progesterone, if added, may prevent this.
Prophylaxis of osteoporosis is managed by increasing calcium intake. It is important for all women to know the importance of a balanced diet, especially plant foods, for example, fresh fruits and vegetables, which promote hormone production and especially soya beans, which have natural oestrogen.
The majority of middle aged or older women do not know what to expect at certain times in their later life, including the cessation of menstruation. Psychological counselling is often valuable and helps the patient understand the intricacies of the physiological changes that are taking place in her.

SECTION 6: NEOPLASTIC DISORDERS

Introduction

This section looks at neoplastic disorders, (more commonly known as tumours). You may find that here these two terms will be used interchangeably. You need to have an idea of the underlying pathology of these tumours so that you can identify them early and decide whether referral to hospital is urgently needed or not. You will also look at neoplasms of the genital tract and the breast (the breast is an assessory organ of the reproductive system).
This unit covers the types of neoplasms, aetiological factors, and prevention in general and then go on to a more detailed discussion of how each organ is affected.

Objectives

By the end of this section you will be able to:

- List two types of tumours
- State causative factors
- Describe the investigations carried out to rule out tumours
- Describe the management of various neoplasms of the reproductive organs

Tumours

There are two types of tumours:

- Benign, which are confined to a particular tissue. They include warts or multiple papillomata, fribroma and lipoma and endometriosis.
- Malignant, which tend to spread to other organs near and far, for example, carcinomas that affect the epithelial cells and sarcoma affecting the connective tissue.

Causes of Neoplasms

The causes of neoplasms are not well known but they are associated with the following:

- Drugs, for example, thalidomide, a tranquilliser once widely used, causes deformities in new born babies as well as tumours.
- Radiation may lead to leukaemia (cancer of the blood).
- Toxins, for example, aflatoxin found in cereals and groundnuts may lead to carcinoma of the liver.
- Alcohol may lead to cirrhosis of the liver.
- Smoking is associated with cancer of the lungs.
- High parity women are reportedly prone to cancer of the cervix.
- Sexual activity, especially at an early age may also lead to cancer of the cervix.

Diagnosis

The diagnosis is generally based on clinical suspicion, symptoms, signs and examination and a biopsy for histology.

Management

The management of neoplasms follows the same general measures that you have been looking at throughout this unit. Can you remember them?
The first step is to take a detailed history. Your investigations should include routine laboratory data like haemoglobin, urea, blood group, urinalysis and so on. You should also conduct an Examination Under Anesthesia (EUA) where a biopsy is taken to detect the type of cancer and staging.
Following this, treatment may take several forms. Surgery may be palliative in the late stages and in cases where the tumour mass is reduced. Radical surgery is performed in the early stages and involves the whole organ/system being removed. This procedure is sometimes curative.
Chemotherapy involves the administration of anti-cancer drugs. Radiotherapy is usually recommended in the advanced stage. More often, a combination of all the aforementioned treatments is used.

Prevention

Can this condition be prevented? There are measures that women can take which would help to curb tumours in their early stages and control them. These include the following:

- A pelvic examination once a year.
- Breast examination (women can also be taught self-examination and are encouraged to perform this frequently).
- Pap smear tests for all women of reproductive age once every year. For a detailed explanation of the findings of the Pap smear test, refer to unit four. Remember that Class IV refers to obvious malignancy.

Remember:
If Class III and IV are found in a woman of reproductive age, a cone biopsy is performed. If the woman is not of reproductive age then a sub-total abdominal hysterectomy is recommended

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Continuing below are more measures that women can take which would help to curb tumours in their early stages and control them.

- Sonography, whereby a scan of the pelvic area attempts to identify ovarian tumours and uterine fibroids.
- Endometrial biopsy in post-menopausal bleeding after dilatation and curettage to detect cancer of endometrium.

Now move on to look at specific organs and see the type of tumours that affect them and how to manage them.

Types of Tumour and their Management

Tumours of the Vulva

Genital cancers in women account for 5% of the reproductive organ cancers. The benign lesions (tumours) of the vulva include:

- Bartholin's cyst/abscess which is the most common.
- Granuloma lesions which arise as a reaction to germs due to condylomata lata in third stage tissue reaction, tuberculosis, schistosomiasis and/or condylomata acuminata due to viral warts.
- Very rarely carcinoma may arise in Bartholin's gland.

Another rare tumour of the vulva is basal cell carcinoma (rodent ulcer), which grows slowly and does not metastasise although it infiltrates locally.

The symptoms and signs that are diagnostic in neoplastic conditions of the vulva are:

- Ulcer or swelling, soreness or irritations are early signs.
- Slight bleeding may occur.
- Later, there is a purulent discharge, which becomes very offensive.
- Enlarged inguinal glands may breakdown and ulcerate and occasionally severe haemorrhage may occur from erosion of femoral vessels.
- Diagnosis is made by biopsy taken for histologic examination.

Prevention

Early biopsy should be done in suspicious cases in women with leukoplakia and itching.

Prognosis

The prognosis depends on the stage at which the condition is first diagnosed. It is usually worse when glands are involved. The size of the lesion affects the outcome. Lesions that are less than 2cm in diameter have twice as good a prognosis as larger tumours. If the tumour is first detected when it is small, with no palpable glands, then it can be completely removed with the glands and the patient has a 75% chance of surviving up to five years.

Treatment

For cancer of the vulva, treatment will include examination under anaesthesia after which a biopsy is taken, and staging done. Surgery may involve the radical excision of the vulva and of the inguinal and femoral glands on both sides, especially if it is undertaken in the late stage.

Alternatively, an excision and biopsy may be done. Radiotherapy is performed on tumours at the fourchette because of involvement of the anal canal. This may be curative in the early stages.

Tumours of the Urethra

A urethra carbuncle is a small, bright red swelling at the urethral orifice, usually occurring

in menopausal women. Some carbuncles cause no symptoms but most are very tender, and may cause dyspareunia or pain on micturition. They are not neoplastic but probably result from chronic infection of the paraurethral glands in the floor of the urethra.
Treatment is by excision or destruction by diathermy. Carcinoma of the urethra is a rare tumour but if it occurs, it is usually a squamous cell carcinoma arising near the meatus. It may sometimes be an adenocarcinoma arising in the paraurethral glands.

Tumours of the Vagina
The benign tumours here include condylomata acuminata, which are also known as venereal genital warts. This is caused by the human papilloma virus and is transmitted through genital contact.
The originally small papillary growths tend to coalesce and form large cauliflower-like masses, which proliferate profusely during pregnancy. The growths may aggregate into a large mass that may even block the introitus during late delivery. Secondary infection is common. These venereal warts usually regress markedly during puerperium and may even disappear. The virus does not affect the foetus.

Management
The most effective drug is fluorouracil, recommended for use only during non-pregnant state because it is noxious to the foetus. The gravida with this condition should be treated by cryotherapy or excision of the lesions. Improved vaginal hygiene is also beneficial.
Fibromyoma is another benign tumour which may occasionally arise in the vaginal wall. It is hard and smooth and can easily be enucleated. Another possible tumour is endometriosis, a condition that has already been discussed in section two of this unit.
Carcinoma of the vagina is rare and, if it occurs, it is usually of the squamous type. Cancer of the cervix very commonly spreads to the vaginal vault. In the case of endometrial carcinoma, isolated vaginal metastases may occur.
Patients with cancer of the vagina complain of bleeding, especially after coitus and later, an offensive watery discharge. The growth may ulcerate forming a fistula into the rectum or vagina.

Treatment
Treatment is often very unsatisfactory. Most cases are treated by local application of radium or caesium and external irradiation of the lymphatic glands of the pelvis. The only alternative treatment is extensive operation to remove the whole vagina, uterus and pelvic lymphatic glands. If the rectum is involved, it is also removed and colostomy established.

Tumours of the Cervix
The benign tumours here are:
- Polyps
- Fibroids
- Nabothian follicles (which are often a result of infection)

The carcinomas include adenocarcinoma, which is common, and squamous, which is less common.
Carcinoma of the cervix is a common genital malignancy. It begins in the cervix at the margin of the external os where it stays for sometime before it begins to penetrate the neighbouring tissues. It extends outwards towards the pelvic wall, downwards into the vagina, backwards to the rectum and forwards to the bladder.

Signs and Symptoms
The affected patient is likely to be between 30 to 40 years of age and the signs and symptoms may present with:
- Post-coital bleeding because the penis rubs on the ulcerated cervix.
- Post-menopausal bleeding. Any woman who resumes bleeding per vagina after menstruation had ceased should suspect the possibility of cancer of the cervix.
- Offensive purulent discharge per vagina will indicate infection of the necrotic surfaces of the tumour.
- Pain in the lower abdomen or back (this is a very late symptom).

Risk factors include:
- Early age (usually below 18 years) of first coitus.
- Multiple sexual partners.
- Viral infections like Herpes Simplex Type II.
- High parity, that is, above five children.
- Poor hygiene, whereby dirt collects in the vagina or in the foreskin of uncircumcised men.

Prevention
As mentioned earlier, prevention includes educating women of a reproductive age to be aware of the signs and symptoms of the

condition, which will enable them to seek early treatment. Also women should be encouraged to take the Papanicolaou test every year.

Management
Initial diagnosis should follow these steps:

- Take the patient's history
- Physical examination
- Perform a biopsy
- In the early stage, a Pap smear test will help discover whether the condition is curable
- Examination Under Anaesthesia (EUA) in order to conduct the biopsy and do staging

After a diagnosis has been made, treatment should be given. Surgery involves radical hysterectomy in the early stages or may be necessary in combination with radiotherapy. Radiotherapy is either external (pelvis) or intracavity (caecium in the uterine cavity).
The prognosis is best in the early stages of the disease. Survival from the five year time frame and beyond is very poor. Complications of radiotherapy include relapses, ovarian failure, RVF and VVF.

Tumours of the Ovaries
The ovary is the only organ in the body that is capable of producing many varieties of tumours. The majority of them are cystic and benign. Some are highly malignant and some produce oestrogen with symptoms of menorrhagia.
The cysts of the ovarian follicle or corpus luteum are:

- Follicular cysts symptoms vary from no symptoms to pain and/or haemorrhage - they may not be palpable however. Occasionally a follicular cyst may reach the size of a tennis ball and it may then cause discomfort and be palpable on vaginal examination.
- Lutein and theca lutein cysts are lined by cells of the corpus luteum type and may arise from either granulosa or theca. They look yellowish like the corpus luteum and the most common type is the corpus luteum cyst.
- Blood cysts whereby there is bleeding into the follicular cyst, a corpus luteum or a neoplasm in the ovary. If the blood has been shed for some time, it will be thicker and darker than normal blood. In this case the name of 'chocolate' or 'tarry' cyst is often given.

Benign ovarian neoplasms include:

- Mucinous cystadenoma, which is the most common of all ovarian neoplasms and can reach an enormous size and distend most of the abdomen. They can occur at any age but are rare before puberty.
- Serous cystadenoma is a common type of benign new growth. It has a smooth lining, which may be confused with a large follicular cyst at operation.
- Dermoid cyst or benign teratoma may contain almost any type of tissue derived from two or more of the primary germ layers, that is, endoderm, mesoderm and ectoderm. They are mixed together in an irregular pattern. A dermoid cyst may occur at any age but is most common during reproductive age and particularly between the ages of 20 and 30 years.

Malignant tumours of the ovary are the third most common tumours affecting the genital tract. The first is cancer of the uterus, followed by cancer of the cervix.
Ovarian cancer tends to spread quietly around the peritoneum of the pelvis and to the alimentary canal. It infiltrates the omentum, too, should that structure adhere to it. The prognosis is usually poor due to its silent nature. When the tumour spreads to other organs, there will be symptoms referable to them.
Complications of ovarian tumours in order of frequency include:

- Torsion, that is, the tumour can twist on its pedicle as long as it is not fixed to any surrounding structure. The patient complains of pain in the lower abdomen, which may start after sudden movement, or slow onset of pain. When the torsion is rapid, the pain is severe and patient may vomit repeatedly. On examination, the abdomen is tender but not rigid as in peritonitis. There is a firm tender lump, which is separated from the uterus on abdominal and bimanual examination.
- Rupture of the cyst may occur spontaneously. This is a serious matter and an immediate laparotomy should be done if the cyst is large and feels like it is going to rupture.

- Haemorrhage, especially small haemorrhages into the ovarian cyst, is common. Most of them seem to cause no symptoms but are only seen at laparostomy. Occasionally a massive haemorrhage may take place in a cyst, particularly a malignant one and may cause pain similar to that of torsion.
- Infection is not very common but a cyst may be involved in any local inflammatory process such as appendicitis diverticulitis.

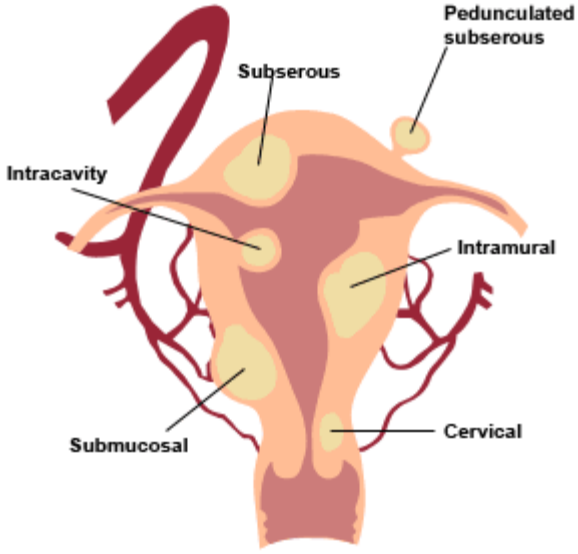
Management
This may take several forms. If surgery is indicated, the surgeon may be faced with various possibilities. These include a cystectomy of either one ovary or bilateral ovary with removal of the opposite ovary or removal of ovaries, tubes and uterus. Surgery may, alternatively, involve the removal of as much malignant tissue as possible or the biopsy of an inoperable mass.
A cystectomy involves the shelling of the benign tumour out of its ovarian bed, leaving behind normal ovarian tissue, which will continue its function of ovulation and production of hormones.

Remember:
Torsion and rupture of a cyst is an acute surgical emergency. The ovary and tube must be removed.

Tumours of the Uterus
The benign tumour that is the most common growth in the uterus of women is the fibroid (fibromyoma). This tumour arises in the muscular wall of the uterus. Tumours vary in size from minute seedling growths to enormous masses, which occupy nearly the whole abdomen. They are often multiple.
Cancer of the uterus is also found in the endometrium and is usually adenocarcinoma of the body of the uterus and sarcoma.

Uterine Fibroids
You will see in the illustration opposite that varieties of uterine fibroids are named depending on their location in the uterus.
The table below states the incidence of uterine fibroids.

Incidence	
Intramural	70%
Inward growth	
Submucosal and Intracavity	10%
Outward growth	
Subserous and Cervical	20%



The different varieties of uterine fibroids include:

Interstitial
Interstitial, which begin as small nodules in the myometrium. When they increase in size, they tend to extrude towards the peritoneal surface or into the uterine cavity. There is increased menstrual loss due to enlargement of the uterine body.

Subserous
Subserous (subperitoneal) fibroids lie outside of the uterus and are covered with peritoneum. They are usually multiple, ranging from small nodules on the surface of the uterus to enormous masses weighing up to 20 kgs or more. They tend to grow up into the abdomen and may become pendunculated so that on bimanual examination, the tumour seems to be separated from the uterus and feel like an ovarian tumour.

Submucous
Submucous (subendometrial) fibroids are near the endometrium or hang into the cavity in which case they form a polyp with a long pedicle. The stalk of the polyp contains a few blood vessels, which nourish it. The uterine cavity may contract

and hence the cervix dilates and expels the polyp through it.

Cervical Fibroids

Cervical fibroids are rare. Only 2% of uterine fibroids arise in the cervix. Usually it is a single tumour, although there may be other tumours in the body of the uterus. This type of tumour will cause distortion and elongation of the cervical canal and displace the body of uterus upwards. A large one may cause retention of urine.

The development of uterine fibroids is related to the action of oestrogen in a way not well understood. They arise during the period of menstrual activity although there are rarely symptoms before the age of 25 years.

The fibroids are more commonly found in nulliparous women or women who have not been pregnant for some time. They tend to occur three times more frequently in black women than in white women and occur at earlier age in the former. Reasons for this are not known.

Common Symptoms

First of all, it is important to note that there may be no symptoms in a woman with uterine fibroids. The condition may simply be discovered during a routine examination. However, the following signs and symptoms may be apparent:

- An abdominal tumour is sometimes the first thing that the patient notices. It is not tender and rarely gives rise to pain, but occasionally causes local discomfort and a feeling of weight.
- Menorrhagia is a common reason for the patient to seek medical advice. Periods increase in amount and duration and may be accompanied by clots, but cycles are regular.
- Pain is not a common symptom but when it occurs, it is generally an indication that there is associated endometriosis or PID or some complications like torsion. There may be colicky pain while a fibryomatous polyp is being extruded through the cervix by uterine contractions.
- Frequency and retention of urine, especially with a large tumour pressing on the bladder.
- Affects child bearing, mostly because it tends to cause abortion. Also, submucous growth projecting into and distending the uterine cavity and interstitial tumours may obstruct labour.

Keep in mind that physical signs will vary with size, position and number of tumours and may include:

- Asymmetrical enlargement of the uterus, which is found with a submucous growth projecting into and distending the uterine cavity.
- The uterus feels harder than it does when the enlargement is due to pregnancy.
- Not tender on palpation, unless the tumour is undergoing red degeneration.
- Uterine soufflé (a soft blowing sound made by the blood within the arteries of the gravid uterus) similar to that of pregnancy, may occasionally be heard on auscultation.
- On pelvic examination the cervix may be found to be pushed down or displaced to one side.

Infertility is usually a common presenting problem when the fibroid is discovered during routine examination.

Management

For small benign tumours that are not causing symptoms, no treatment is required but the patient should be re-examined regularly (every six to twelve months). If the tumour is found to be increasing in size, it should be treated. The patient and family (especially spouse) should be counselled on the effects of the tumour on menstruation, menopause and libido. Usually, such tumours cease to grow once menopause has been reached. At this point they grow slowly and seldom become malignant.

Surgical treatment is definitely indicated in case of heavy or prolonged bleeding caused by large tumours, even if they are not causing problems, and especially in young women because further growth is probable. It is also necessary in cases where there is possible malignant change, such as a tumour, which grows after the menopause, where the tumour leads to retention of urine or obstructs labour or if the tumour has undergone torsion.

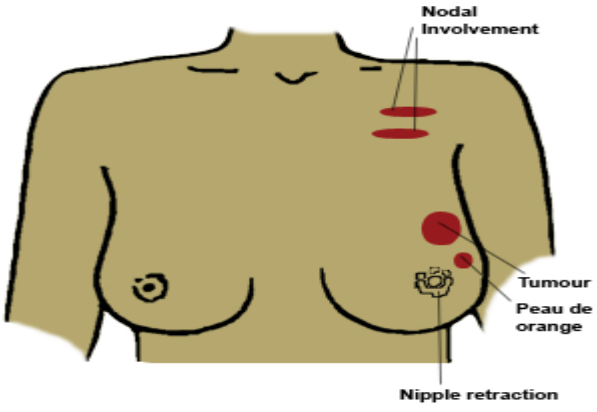
An operation is necessary in the above conditions for the recovery or preservation of the patient's health. However, there are also other alternatives available. Myomectomy is the removal of the fibroid, where the uterus is retained. This is indicated when the woman wishes to keep her uterus and also in cases of infertility whereby no other cause of sterility can be found. Hysterectomy is the removal of the

uterus with the fibroid. This procedure is indicated in patients who are 40 years of age and above.
Pre and post-operative care are the same as for any other major surgery.

Prognosis
Surgical therapy is curative. Pregnancy is possible after multiple myomectomy. Premature menopause will not occur in a well-executed hysterectomy, where the ovaries are retained.

Carcinoma of the Uterus
Common malignancies affecting the female are those of the breast and uterus. Sarcomas are rather uncommon uterine malignancies accounting for less than 2% of total malignancies. The causes of the condition are still unknown. It occurs most frequently in post-menopausal women.
You have taken a step-by-step approach to the explanation of benign and malignant tumours in each organ of the genital tract and touched on possible management techniques. These are not pleasant conditions since the prognosis is not always positive. Nevertheless, you will come across them and should be prepared to deal with them.
Now move on to look at carcinoma of the breast.

Carcinoma of the Breast
The breast is the most common site of carcinoma in women aged 40 to 44 years of age and the leading cause of death. Most often, the general surgeon will handle growths or lesions in the breast. However, it is important for you to learn how these conditions present, associated risk factors and their management and follow up.



Some of the following factors are most commonly associated with increased risks of breast cancer. They include:

- Heredity, although the mechanism of inheritance is not clear. Studies have shown that women whose mothers or sisters have had cancer of the breast are two to three times more likely to develop the disease.
- Marital status and parity, where single and nulliparous women have a slightly higher incidence of breast cancer than married and parous women. Women with three or more children have a lower incidence than women with fewer children.
- Mammary dysplasia or cystic disease of the breast, particularly when accompanied by proliferative change, papillomatosis or solid hyperplasia is associated with increased incidence of cancer.
- A woman with cancer in one breast is at risk of developing cancer in the opposite breast.
- Women with cancer of the uterus and/or the ovary face an almost doubled risk of developing breast cancer when compared with the general population.
- Significant percentages of women with breast cancer may have abnormal hormonal environment.
- Oral contraceptives and menopausal oestrogen may produce proliferation of epithelial elements within the breast.

You will now look at the clinical findings. Usually a lump presents in the breast. Clinical evaluation begins with a complete history and physical examination. A biopsy is taken to confirm diagnosis. The extent (stage) is determined in order to avoid inappropriate measures like radical mastectomy in a patient with distant metastases.
The following steps should be taken during clinical evaluation:

- Take a thorough medical history.
- Take special note of menarche, pregnancies, last menstrual period, previous breast lesions and family history of breast cancer.
- Presenting complaints in which you will find that 80% of cases will have a painless lump, and in 90% of cases, the

lump will have been discovered by the patient herself.

- Breast examination (see unit one of this module) should be meticulous, methodical and gentle. Examine the breast size and contour, minimal nipple retraction, slight oedema, redness and retraction of skin.
- Breast cancer usually consists of a non-tender firm or hard lump with poorly delimited margins.
- Slight nipple or skin retraction is an important sign.
- Very small erosion (one to two millimetres) of the nipple epithelium may be the only manifestation of cancer.
- Watery, serous or bloody discharge from the nipple is an occasional early sign.

Diagnosis

Before treatment is commenced, a definite diagnosis has to be made through laboratory tests, which will include:

- Blood test for sedimentation rate (which will be raised as a result of a disseminated cancer), alkaline phosphates (when raised is associated with liver metastases) and hypercalcaemia (occasionally an important finding in advanced malignancy of the breast) as well as a complete blood count.
- Urinalysis.

An x-ray should be taken to determine the frequency of metastases to the lungs. A CT scan will help to locate metastases to the bones, brain, etc.

A biopsy should be performed where tissue is removed from the lesion and examined.

A cytology examination of nipple discharge or cyst or the breast is also recommended as well as a mammogram, which is a soft tissue radiological examination of the breast.

Remember:

Treatment should never be undertaken without an unequivocal histological diagnosis of cancer. The safest course is to take biopsy of all suspicious masses found on physical examination.

The two methods used to perform breast biopsy are:

- Needle biopsy, which is the simplest. It involves either the aspiration of tumour cells or obtaining a small core of tissue with special needle (this is an office procedure).
- Open biopsy, which is the most widely used. It is performed under general anaesthesia. When a needle biopsy is negative it should be confirmed by open method.

Management of Breast Cancer

The treatment may be curative or palliative according to clinical stage I, II, III disease. Palliative treatment by radiation, hormones, chemotherapy or a combination of methods is recommended for patients in stage IV of the disease (distant metastases) and for previously treated patients who have developed distant metastases or ineradicable local recurrences.

Radical Mastectomy

This involves en bloc removal of the breast, pectoral muscles and axillary nodes. It has been a standard curative procedure for breast cancer since the turn of the last century.

Remember:

This operation is contra-indicated in cancer that has spread to sub-clavicular nodes or to more distant sites because it will not cure the condition.

Extended Radical Mastectomy

This involves the removal of the internal mammary nodes in addition to standard radical mastectomy.

Modified Radical Mastectomy

This involves en bloc removal of the breast and preservation of the pectoralis major muscles. The advantages of this operation are that it is cosmetic and functional in that the preservation of the pectoralis major muscles avoids a hollow beneath the clavicle hence preventing shoulder dysfunction and oedema of the arm.

Simple Mastectomy

This is done if the malignancy is confined to the breast without spread to adjacent muscles or to the regional nodes or beyond.

Local Excision/Lumpectomy
This is also known as a partial mastectomy and provides definitive treatment for early breast cancer, especially for a small Stage I lesion.

Radiotherapy
This method is used for the treatment of certain breast cancers, particularly those that are locally advanced or in cases where the patient refuses a mastectomy.
The procedure can be used in conjunction with radical mastectomy as a pre-operative or post-operative course of action in order to reduce the incidence of local recurrence from residual cancer in the operative field. The process destroys metastatic cancer in the internal mammary and sub-clavicular lymph nodes. Therefore, the patient should be selected for radiotherapy based on the likelihood of local recurrence of the existence of disease in unresected regional nodes.

Chemotherapy
This process can be used in conjunction with radical mastectomy, especially in patients found to have positive axillary nodes.
Mortality and morbidity rates following radical mastectomy are low and the procedure is generally well tolerated even by elderly patients. However, you should note that there are several complications associated with breast cancer.
There are occasionally wound complications like haematoma or serum collection under the skin flaps and necrosis of the skin margins may occur but this can be easily managed. The most serious complications may include:

- Local recurrences of cancer within operative field. This signals the presence of a spread.
- Oedema of the arm. When this appears in the early post-operative period, it is usually caused by lymphatic obstruction. Infection in the axilla may also be a cause of the oedema. This is because the lymphatic drainage of the arm is compromised and the extremity becomes more than normally susceptible to infection following minor injuries.

Chronic oedema should be managed by elevation and by a snugly fitted elastic sleeve, which is slipped over the arm from hand to shoulder. The patient should receive pre and post-operative nursing care in the same way as other surgical patients.

This patient will need long-term care. A periodic re-examination is done to detect recurrences and to observe the opposite breast for second carcinoma. The examination is conducted every six months until a period of five years post-operatively has elapsed. It is then carried out every six to twelve months thereafter for life.
The patient should also be advised on the importance of self-breast examination monthly, especially after menstruation. A mammogram should be obtained annually.
In order to facilitate rehabilitation after breast reconstruction, the patient should be advised on the active exercise of the shoulder and arm on the affected side, which should begin early in the post-operative period. The patient should have been counselled before surgery to enable her to adjust to the cosmetic defect. Before leaving the hospital, she should receive information on where to obtain prosthesis to wear in her brassiere.
The patient should also be informed that, theoretically, high levels of oestrogen produced by the placenta as the pregnancy progresses can be detrimental to the patient with occult metastases of oestrogen sensitive breast cancer.

Prognosis
For cancer confined to the breast the five year clinical cure rate by radical mastectomy is 75 to 90%. When axial nodes are involved, the rate drops to 40 to 60% at five years. Ten years after the radical mastectomy the overall clinical cure rate is only about 25% in this group of patients. Breast cancer tends to be more malignant in young women than in old women.
Lastly, you will look at the benign growths of the breast.

Mammary Dysplasia
This disorder is also known as chronic cystic mastitis of the breast. It is common in women of 30 to 50 years of age, but rare in postmenopausal women. This suggests that it is related to ovarian activity. The oestrogen hormone is considered an aetiologic factor.
Clinical findings include:

- Asymptomatic lump, discovered accidentally in the breast.
- There may be nipple discharge.
- Discomfort occurs or increases during the pre-menstrual phase of the cycle at which period the cyst tends to increase in size.

- Fluctuation in size and rapid appearance or disappearance of a breast tumour is a common feature.
- Many patients will give a history of transient lump in the breast or cyclic breast pain.

Remember:
If skin retraction is present, the diagnosis of cancer should be assumed until it is disproved by biopsy.

Before any treatment is commenced, a biopsy should be done to check for any suspicious lesion. For small, localised cysts, an excision should be carried out after cancer has been ruled out.

If the diagnosis is certain from a previous biopsy, then aspiration of a discrete mass is done. If a cyst is present, typicaly watery fluid, which may be straw-coloured, grey, greenish, brown or black, can be easily evacuated and the mass disappears.

A cytology examination of the fluid is indicated.

The patient should be re-examined at intervals of two to four weeks for three months and every six to twelve months thereafter for life.

Breast pain, associated with generalised mammary dyspalsia, is best treated by avoidance of trauma and by wearing a brassiere (day and night), which gives good support and protection.

Prognosis

You may find that symptoms of pain, tenderness and cyst formation will occur at any time until menopause, when they subside. The risk of breast cancer is usually about twice that of a woman in the general population. Therefore, the woman should be advised to:

- Examine her own breasts each month just after menstruation
- Inform the doctor if mass appears
- Attend clinic appointments regularly

Another benign growth you are going to look at briefly is fibro adenoma of the breast.

Fibro Adenoma of the Breast

This is a common benign neoplasm occurring in young women usually within twenty years after puberty. It frequently tends to occur at an earlier age in black women than in white women. Multiple tumours in one or both breasts are found in 10 to 15% of patients.

The typical fibroadenoma is a round, firm, discrete, relatively movable, non-tender mass of one to five centimetres in diameter. The tumour is usually discovered accidentally. Clinical diagnosis in young patients is generally not difficult. For women over 30 years of age, cancer of the breast must be considered.

A fibroadenoma does not usually occur after the menopause but post-menopause women may develop it after the administration of oestrogenic hormone.

The treatment here is excision and pathologic examination to rule out any cancerous lesions.

Lastly you may remember when looking at abortion, two conditions had been left until the end of this unit. These were hydatid form mole and chorion carcinoma.

Hydatid Form Mole

This is also referred to as molar pregnancy. It is an abnormal pregnancy resulting from a pathologic ovum with proliferation of the epithelial covering of the chorionic villi and dissolution and cysts cavitation of the vascular stroma of the villi. It results in a mass of cysts resembling a bunch of grapes.

Hydatid form change in placenta is a form of trophoblastic neoplasia, which may lead to frankly malignant proliferation of trophoblast cell known as choriocarcinoma. Histologically, to the naked eye, the mole may look like a bunch of whitish grapes, often interspersed with a blood clot (see the illustration opposite).

The hydatid form mole can be classified into two:

- Complete Mole, which shows total hydatid form change with no evidence of foetal circulation. They are more likely to develop malignant change.
- Partial mole, which is associated with foetus (even if the only evidence is traces of a microscopic foetal circulation). They are less likely to develop malignant change.

Now move on to look at the aetiological factors of this condition.

Some of the aetiological factors associated with hydatid mole include maternal age and high parity and malnutrition.

Maternal Age

It is common in women under the age of 20 years and over 45 years in whom congenital abnormalities are most likely to be found.

High Parity and Malnutrition

Although there is no evidence, these factors are associated in every society with congenital abnormalities.

Before they are enumerated it is important to mention that this condition is often not suspected because it is uncommon. Therefore, you should remember to rule it out in cases of threatened abortion and hyperemesis gravidarum. Did you think of the following clinical features?

- Bleeding is common, with a minor degree of intravascular coagulation. This is sometimes accompanied by a watery discharge and occasionally contains vesicles.
- Hyperemesis, which is probably due to an increase in HCG secretion, although this is not the cause in hyperemesis in normal pregnancy.
- Pallor and dyspnoea due to anaemia, which is often greater than expected.
- Anxiety and tremors because of HCG, which is glycoprotein similar to TSH, and has weak thyroid stimulating properties.
- High levels of HCG after 12 weeks of gestation.
- Amenorrhoea and pregnancy test is positive.
- Uterine enlargement where, in most cases, the uterus is larger than expected at 14 weeks of gestation. The uterine size may be normal after detachment of the mole.
- Absent foetal heart. Very rarely a mole and a foetus will co-exist.
- Absent foetal parts on palpation.
- The uterus has a 'doughy' feel.
- Signs and symptoms of pre-eclampsia at 16 weeks are strongly suggestive of a mole (see unit two).
- Proteinuria.
- Vesicles passed per vagina.

Investigation

Investigations will include a urinary essay of HCG and an ultrasound, which is highly diagnostic, especially if the moleis sufficiently developed.

Remember:

Once a hydatid mole is diagnosed, the uterus should be evacuated.

Management

Evacuation is not without risks. Before evacuation, the main risks are the possibility of haemorrhage. There is also the risk of trophoblastic invasion and perforation of the myometrium and/or dissemination of possibly malignant cells.

During evacuation, the main risks include haemorrhage, perforation by instrument and dissemination of possibly malignant cells.

Therefore, in order to ensure the immediate safety of the patient, the following measures may be included in the management. The uterus should be completely emptied by suction after spontaneous abortion. Additionally, an attempt should be made to empty the uterus by suction if spontaneous abortion does not occur. This is usually feasible up to about 14 weeks.

Remember:

Oxytocin must be given if bleeding becomes severe. On rare occasions, an emergency hysterectomy may be unavoidable.

If the mother has passed the 16-week mark, abortion should be induced using prostaglandin and oxytocin.

Rapid evacuation of a large uterus has been known to cause disseminated intravascular coagulation and fatal shock. You should give blood transfusions to treat anaemia. Take a serial pregnancy test and chest x-rays.

In the case of an older woman, who does not wish to have any more children, a complete hysterectomy is justified, especially for the sake of clamping the uterine vessels to prevent the dissemination of trophoblast cells.

When following up, you should ensure the following:

- Family planning methods should be used for one year to prevent immediate pregnancy.
- A pregnancy test should be carried out every month for one year if titres are low and negative. After this, the patient is clear. However, if titres are increased, then suspect choriocarcinoma.
- Chemotherapy is indicated when there is high HCG in serum after six months or detectable HCG in serum after six months.
- Chest x-rays should be taken monthly until titres are negative and then every two months for one year.

Prognosis
Close follow-up and early chemotherapy should result in a cure rate of almost 100% in patients with hydatid form mole. However, you should note that complications, including chorio-carcinoma and early metastases to the lungs are possible.
Now move on to look at cancer of the placenta (choriocarcinoma).

Choriocarcinoma
Choriocarcinoma is cancer of the placenta and it is very common in East Asia. 50% of cases will occur after a hydatid form mole, 25% after abortion, and 25% at interval (pregnancy). The prognosis is very poor as it does not often respond to treatment and many patients will die.
Signs and symptoms are similar to those associated with hydatid form mole, however, metastatic lesions are also present.
Once diagnosed, chemotherapy is immediately indicated.
This will include:

- Methotraxate, a cytotoxic drug, which is the principle drug.
- Combined therapy, that is, the use of multi-drug chemotherapy, especially when methotraxate appears to be ineffective.

The choice of drug depends on the patient. After chemotherapy, the patient is advised to delay conception for a year to give time to the damaged ova to be shed. This is primarily because methotraxate can be retained in the body for up to eight months and it may have damaged the oocytes resulting in the possibility of increased incidences of foetal abnormalities.
This brings you to the end of this section on neoplastic disorders and to the end of this unit.

UNIT SIX: UNDERSTANDING STIS AND HIV/AIDS

In this unit you will cover diagnosis and management of Sexually Transmitted Infections (STIs) and HIV/AIDS diseases, as well as assist your community to prevent them and provide home based care for AIDS patients.

Unit Objectives

By the end of this unit you will be able to:

- Describe the characteristics of common STIs
- Apply the syndrome approach to the management of common STIs
- Describe the causes of HIV/AIDS
- Describe the stages of AIDS
- Explain the management of AIDS patients
- Describe the effects of HIV/AIDS to the individual, family and the community
- Describe preventive strategies for STIs and HIV/AIDS
- Demonstrate how to assist families affected with HIV/AIDS to provide home based care

SECTION 1: KEY CHARACTERISTICS OF THE COMMON STIs

Introduction

STIs are commonly transmitted from one person to another primarily through sexual contact. Therefore, individuals with STIs require prompt and comprehensive management in order to stop them from spreading the infections from one sexual partner to another.
HIV infection is also sexually transmitted and people who are suffering from an STI are at a greater risk of contracting HIV. For this reason, you need to not only manage these individuals promptly but also, educate and counsel them on the need to change their sexual behaviour or practise safer sex. Remember, that although STIs and HIV/AIDS are transmitted primarily through sexual contact, this is not the only route of transmission.

Objectives

By the end of this section, you will be able to:

- Describe the characteristics of some common STIs
- Apply the syndromic approach to manage STIs

Key Characteristics of the Common STIs

The common STIs will be grouped according to their signs and symptoms. This is in keeping with the current management approach known as Syndromic Management of STIs. You have already heard about it or seen the STI management flow charts in many health facilities. Kenya has adopted the syndromic approach, which diagnoses conventional STIs on the basis of syndromes rather than by the causative organisms.
A syndrome simply means a group of signs and symptoms. Although many different organisms cause conventional STIs, these organisms give rise to a limited number of syndromes.

The STIs are divided into five main syndromes as follows:

- Vaginal discharge (Pruritus) in women
- Urethral discharge in men
- Lower abdominal pain in women
- Genital ulcer disease in both men and women
- Ophthalmia neonatorum in newborns

Signs and Symptoms for the Main Syndromes of STIs and their Aetiologies

Syndromes	Symptoms	Signs	Most common aetiology
Vaginal discharge	Vaginal discharge Vaginal itching Dysuria (pain on urination) Dyspareunia (pain during sexual intercourse)	Vaginal discharge	**Vaginitis:** Trichomoniasis Candidiasis Bacterial vaginosis **Cervicitis:** Gonorrhoea Chlamydia
Urethral discharge	Urethral discharge Dysuria Frequent urination	Urethral discharge (if necessary ask patient to milk the urethra)	Gonorrhoea Chlamydia
Lower abdominal pain	Lower abdominal pain Pain during sexual intercourse	Vaginal discharge Lower abdominal pain and tenderness on palpation Temperature < 38 celsius	Gonorrhoea Chlamydia Mixed Bacteria
Genital ulcer	Genital sore	Genital ulcer Enlarged inguinal lymph nodes	Syphilis Chancroid Genital Herpes
Ophthalmia neonatorum	Swollen eyelids Discharge Baby cannot open eyes	Oedema of the eyelids Purulent discharge	Gonorrhoea Chlamydia

If a patient presents with any of these syndromes, it is an indication of an STI and requires prompt treatment.

You also need to note that for the syndromic management of STIs to succeed, the four C's need to be emphasised at every stage you come across the patient.

Counselling
This requires that you discuss the condition with the patient with an aim of finding a solution or ways of preventing STIs re-infection and spread. (Revise counselling skills).

Compliance
You need to explain to the patient the danger of self medication and that they should take the full dose of the prescribed medicine for better results.

Condoms
You need to explain and demonstrate proper use of the condom, if abstinence is impossible. Also condoms should be availed to those who need them to make sex safer.

Contact Tracing

This is for the purpose of treating sex partner(s) to avoid re-infection and spread of STI.

Vaginal Discharges

Discharge in this context means the flow of secretions from the vagina. Normal vaginal discharge, which is clear, mucoid with no smell, and small in amount. The normal amount might increase during ovulation or pregnancy or if the woman is using birth control pills. This differs with abnormal discharge in that the latter is a lot more and has a characteristic smell and colour. Therefore, abnormal discharges indicate infection.

Causes of Vaginal Discharges

There are two main causes of abnormal vaginal discharge, these are vaginitis and cervicitis. Vaginitis refers to inflammation of the vaginal wall, which could be caused by fungus candida albicans. This is a yeast species, which is commonly found in the vagina in small

quantities. However, if there is an increase in the quantity of the fungi for any reason, this may cause inflammation of the vaginal wall which leads to the discharge.

Factors that make candida albicans overgrow include pregnancy, diabetes, lowered immunity of the individual, or if the patient is on antibiotic or corticosteroids therapy. Vaginitis can be caused by a protozoa trichomonas vaginalis (trichomoniasis) or overgrowth of several species of bacteria including gardnerella vaginalis or anaerobic bacteria.

The other cause of vaginal discharge is cervicitis. This is an infection of the cervix caused by neisseria gonorrhoea (gonorrhoea) or chlamydia trachomatis (chlamydia).

Signs and Symptoms of Vaginal Discharge

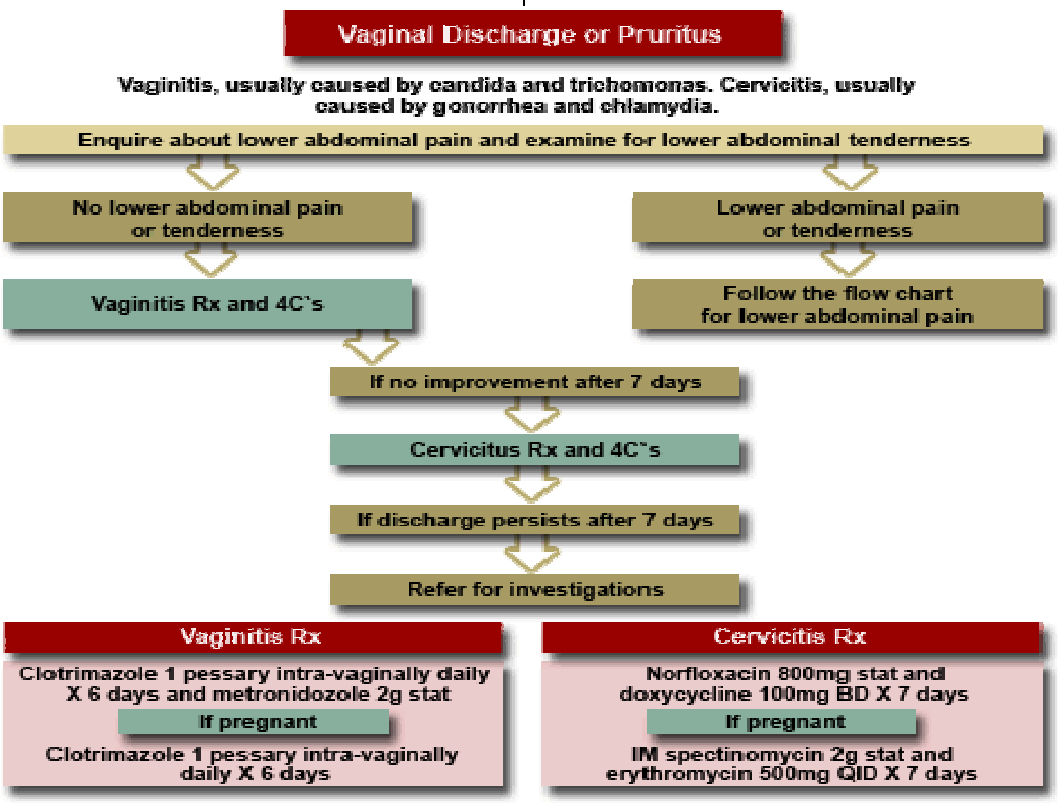
Signs and symptoms of vaginal discharge include:

- The abnormal discharge is more than usual and it has unpleasant smell. Its colour depends on the causative organisms, so it is green, yellow or curd like.
- In both vaginitis and cervitis, the discharge may be associated with painful urination due to inflammation of the urethra, or dyspareunia (painful sexual intercourse) and is accompanied by itching of the vulva or vagina, or an inflamed and swollen vulva.
- In cervicitis there is redness, inflammation and bleeding from the cervix (this is symptomatic in most women). The Bartholin's glands are swollen and tender and the patient complains of abdominal pain.

Diagnosis

The various signs and symptoms already discussed can be used to distinguish vaginitis and cervicitis. To confirm cervicitis, a speculum should be used to visualise the cervix. Now look at the NASCOP flow chart used in the syndromic management of vaginal discharge. It is an easy tool to use

NASCOP Syndromic Flow Chart for Vaginal Discharge Chart



Management
Management is based on the syndromic approach. If there is no abdominal pain or tenderness, follow the NASCOP Syndromic Flow Chart for Vaginal Discharge. Put the patient on clotrimazole 1 pessary intravaginally daily for six days and metronidozole 2gm stat. If the patient is pregnant, metronidozole is not prescribed. If there is no improvement after seven days, change to the second line of treatment, which is norfloxacin 800mg stat and doxycycline 100mg twice a day for seven days. In pregnancy treat with intramuscular spectinomycin 2gm stat and erythromycin 500gm four times a day for seven days. If after this treatment there is no improvement, refer the patient for further investigation.
As part of management all patients must be informed about the four C's approach, that is, Counselling, Compliance, Contact Tracing and Condom use for safe sex. You should counsel your patient on health seeking behaviour, which involves abstention from sexual intercourse to avoid reinfection, or the use of a condom to make
sex safe.
Advise your patient to avoid self medication and remind them of the need to take drugs as explained to ensure full recovery. You should also advise them to bring their sex partners in for treatment because if the partner is not treated, the patient will be re-infected. Tell the patient about the importance of being faithful to one sex partner to avoid future STIs.

Consequences
Although a small amount of unusual vaginal discharge is a common female complaint, it is a sign of infection and if left untreated, the infection may place the woman, her sex partner and the newborn at risk of acquiring the STIs.
The consequences are very different depending on whether the vaginal discharge is caused by vaginitis or cervicitis. Vaginitis is painful but has fewer severe consequences than cervicitis.
The possible consequences of both vaginitis and cervicitis include:

- Vaginal discharges can create problems with partners during sexual intercourse due to the foul smell or pain (dyspareunia).
- Cervicitis and vaginitis increase susceptibility to HIV infection.
- In cervicitis ascending infection may lead to inflammation of the pelvic organs causing blockage of the fallopian tubes, leading to ectopic pregnancy or infertility.
- In cervicitis the infection could spread to the Bartholin's gland, leading to abscesses or spread in blood circulation (septicaemia) causing arthritis, endocarditis or meningitis, especially if it is of gonococcal origin.

These consequences are grave and that is why you have to be prompt with treatment.

Urethral Discharge

Urethral Discharge
The urethral discharge usually refers to a discharge from the penis, although women can develop an infection in the urethra, which results in urethral discharge. Due to the internal position of the urethra in women, it is often confused with vaginal discharge or goes unnoticed hence the delay in seeking treatment.
Before you proceed, please revise the anatomy and physiology of both the male and the female reproductive organs to appreciate the difference. There is no normal discharge from the penis, therefore, any discharge from the urethra is abnormal and a sign of infection.

Causes of Urethral Discharge
Most urethral discharges indicate the presence of gonorrhoea or chlamydia, or both. The discharges could also be due to trichomoniasis. It is usually difficult to tell the difference through physical examination, especially when there is a mixed infection and this is why, in the absence of laboratory investigations, the flow chart becomes an essential tool.

Signs and Symptoms
Signs and symptoms include:

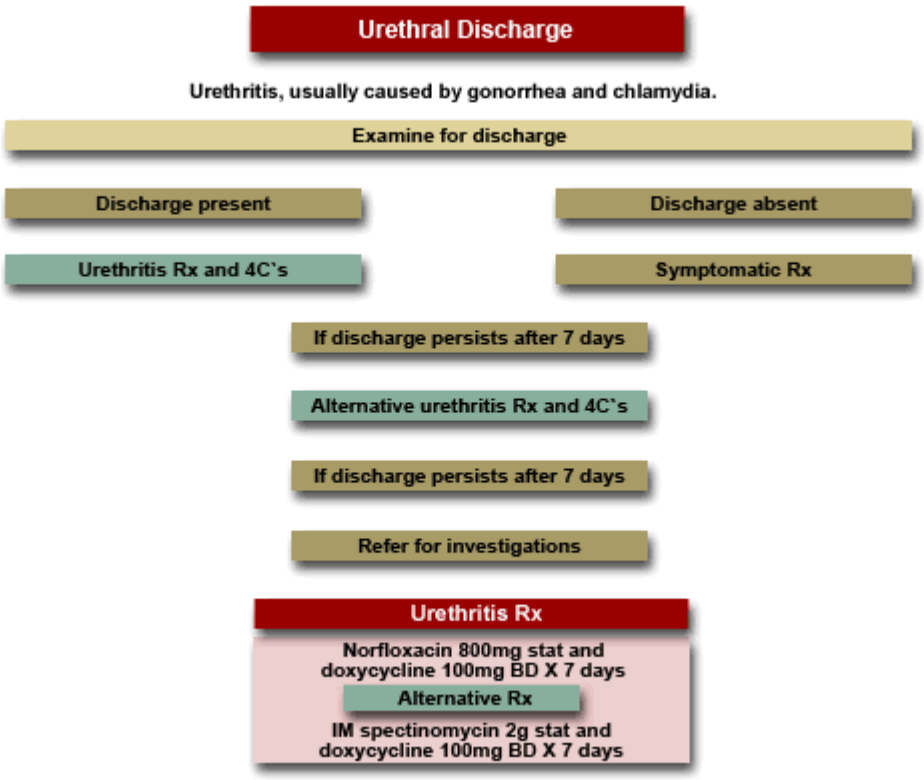
- The discharge may be abundant and purulent (pus like) or watery and whitish.
- The discharge may be associated with

painful and frequent urination, with or without testicular pain, itching of the glans penis, foreskin or urethra, a foreskin which is swollen (oedematous), tight (phimosis) or cracked and shows an increased severity of symptoms before or during the first urination of the morning.

Diagnosis

You diagnose urethral discharge through the information you obtain from the patient and physically examining the penis to note the amount and type of discharge. Laboratory tests help to isolate the causative organisms where possible.

NASCOP Syndromic Flow Chart for Urethral Discharge



Management

The patient should be managed by following the NASCOP Syndromic Flow Chart for Urethral Discharge, which is recommended for low resource areas without laboratory services. However, where laboratory services are available, you can use them and at the same time start the recommended drugs. If there is discharge, start the patient on treatment for urethritis as shown in the NASCOP Syndromic Flow Chart for Urethral Discharge to include norfloxacin 800mg stat and doxycycline 100mg orally twice a day for seven days. If there is no improvement after seven days, give the patient the second line of treatment, which is spectinomycin 2mg IM stat and doxycycline 100mg four times a day for seven days. A patient who still has a discharge after seven days should be referred for laboratory investigations.

At the same time, ask for his sex partner(s) to come in for treatment because if they are not treated he will be re-infected. Emphasise the fact that each of them has to complete the dose and come back for follow up. Also, you should take this opportunity to educate them on the importance of abstinence during treatment and being faithful to one sex partner thereafter to avoid re-infection. If that is not possible, the

knowledge of proper condom use may be beneficial.

All this is clearly indicated in the NASCOP Syndomic Flow Chart for Urethral Discharge. Use the chart to diagnose, treat and educate about STIs. It will be of great help in your practice.
Contact tracing cannot be over emphasised because it is the only sure way of clearing the infection.

Complications
Any discharge from the penis (urethra) is an indication of infections. If these infections are not treated properly, they can lead to multiple complications, which include:

- Urethral abscesses.
- Urethral stricture (causing urinary blockage), which is a progressive condition which produces renal failure after
  many years.
- Infection of epididymis and testis (Epididymo-orchitis) leading to infertility.
- Inflammation of the prostrate gland (prostatitis).
- Inflammation of the urinary bladder (cystitis).

The infection may also spread into the circulatory system (septicaemia), the membranes which cover moveable joints (arthritis), the moveable lining of the heart (endocarditis) or the membranes of the brain (meningitis), especially if the infection is of gonococcal origin.
Similarly, untreated urethral discharges have consequences for others. The infection is easily transmitted to sexual partner(s), and through the female sex partner(s) to any newborns. The newborn may develop ophthalmia neonatorum, which may lead to blindness.
In conclusion, untreated urethral discharge means untreated infection, which may have serious consequences for the man, his sex partner(s) and even to newborns, or children, a situation which can be prevented if prompt treatment is availed.
Lower abdominal pain and tenderness in a woman usually is symptomatic of inflamed ovaries, fallopian tubes and or uterus. It is also referred to as pelvic inflammatory disease (PID). Pelvic inflammatory disease is a complication arising from untreated infections in the vagina or cervix. In this topic you will learn the basic facts concerning this serious and potentially fatal condition.

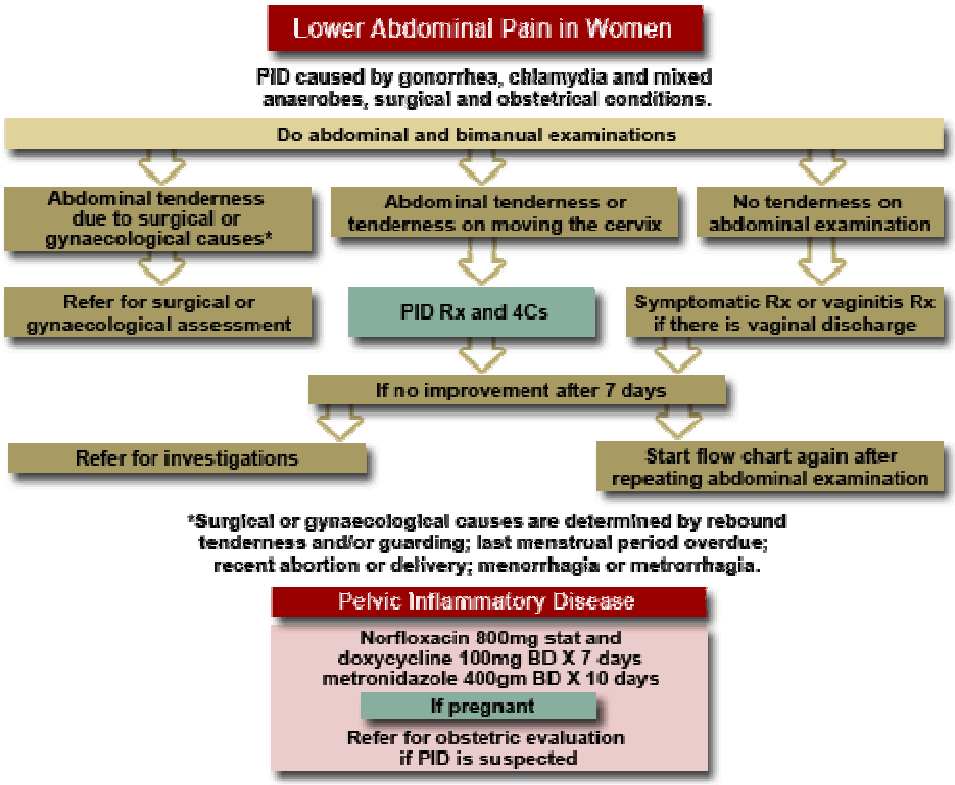
Causes of Pelvic Inflammatory Disease (PID)
PID gives rise to lower abdominal pain as a symptom. PID occurs when the bacteria causing cervicitis spread to involve the internal reproductive organs, which include the ovaries, fallopian tubes and uterus.
PID is almost always caused by a combination of bacteria. This includes the same bacteria that cause cervitis (neisseria gonorrhoeae and chlamydia trachomatis) but also several other species including anaerobic bacteria and streptococci.
PID is usually transmitted sexually. However, infection in the reproductive organs also may occur after childbirth or abortion (Puerperal sepsis) or after gynaecologic surgery (Pelvic cellulitis
and thrombophlebitis).

Signs and Symptoms of PID
The patient will complain of lower abdominal pain and tenderness (appendicitis and an ectopic pregnancy should be ruled out). PID may be associated with:

- Offensive vaginal discharge
- Both urethral and vaginal discharge
- Painful intercourse (dyspareunia)
- Low grade fever
- Urgent or frequent urination
- General malaise

Diagnosis
To diagnose lower abdominal pain, you should obtain a history from the patient, which will indicate pelvic inflammation diseases and may even give the clues of the cause. Please, look at the causes of PID which have just been covered.
A lower abdominal examination should also be carried out to assess the intensity of pain and from which side of the abdomen the pain emanates. A bimanual examination should also be done where the state of the uterus and cervix are assessed. (please review the procedure on bimanual assessment in unit five on Gynaecology). Vaginal discharge is also assessed to note the amount, texture, colour and the smell of discharge.

NASCOP Syndromic Flow Chart for Lower Abdominal Pain



To isolate causative organisms, laboratory tests are required but for areas where access to laboratory services is difficult, use the NASCOP Syndomic Flow Chart for Lower Abdominal Pain and start the patient on the first line of treatment, making sure the instructions given on the chart are followed. For example, if the patient is pregnant, do not start her on any treatment but refer her for obstetric evaluation. If on palpation there is no tenderness and no vaginal discharge, you should not start her on any treatment but should assess her again after seven days for PID. If during the initial assessment there is no tenderness but there is vaginal discharge, treat her as per vaginal discharge using the NASCOP Syndomic Flow Chart for Lower Abdominal Pain. If there is no improvement after seven days then refer the
patient to a health facility where there are laboratory
services for investigations and obstetric evaluation.

Management

For management of PID use the NASCOP Syndromic Flow Chart for Lower Abdominal Pain to start the patient on the first line of treatment. Treatment is norfloxacin 800mg stat, doxycycline 100mg twice a day for seven days and metronidazole 400mg twice a day for ten days. If there is no improvement after seven days, then refer her to a health facility with laboratory services for further investigations.

As part of the management, you should advise the patient to abstain from sex because it is uncomfortable for her and it will also spread the infection to others. She should also be asked to bring in her sexual partner who will be put on the same treatment to avoid re-infection after she is cured.

The use of condoms should be discussed just in case they cannot abstain. As you go through the NASCOP Syndromic Flow chart for Lower Abdominal Pain for treatment of lower abdominal pain in women, you note that there is only first line treatment, after which is referral. This is because the PID, which causes lower abdominal pain, has severe long term

complications, which may develop if treatment is delayed.

Surgical or gynaecological causes are determined by:

•Rebound and/or guarding tenderness

•Delayed menstrual periods

•Recent delivery or abortion

• Menorrhagia or metrorrhagia

Complications of PID

If not treated, PID will cause considerable pain and suffering with severe long term complications, for example, infertility and even death. The most likely complications include:

- Increased susceptibility to HIV infection.
- Chronic low back pain or chronic low-grade fever.
- Frequent miscarriages.
- Ectopic pregnancy.
- Infertility due to scarring and blockage of the fallopian tubes.
- Other organs can be infected, for example, the perimetrium, leading to peritonitis or urinary bladder leading to cystitis.

Consequences

Women debilitated by PID find it difficult to fulfil family and economic responsibilities, thus leading to poverty. They may also suffer painful intercourse, irregular bleeding, frequent miscarriage or infertility, which can lead to marital problems such as separation or divorce. Also, the bacteria causing PID usually are the same ones causing cervicitis, that is, neisseria gonorrhoeae and chlamydia trachomatis which are easily transmitted, endangering the health of the woman's partners and her new born. Her partner, once infected, will develop urethritis and the newborn may develop pneumonia or opthalmia neonatorum.

You have seen how important it is to recognise lower abdominal pain and take appropriate action since it's a pointer to PID. If treatment is delayed, it causes misery to the individual patient and her family.

Genital Ulcer Disease (GUD)

Genital Ulcer Disease (GUD)

These are a group of three sexually transmitted infections, which produce ulcers in the genital or anal area. They are chancroid, syphilis and herpes. These infections affect both sexes alike.

You will now learn about each of the three GUDs separately to help us identify the clinical presentation of each and give appropriate treatment to patients. You should note that with the AIDS pandemic, GUD has assumed a special significance because it facilities transmission of HIV infection, therefore it requires special attention.

Chancroid

As mentioned earlier, the mode of transmission is through sexual contact and the causative organism is a gram-negative bacterium called Haemophilus Ducreyi. The incubation period in men is four to seven days while in women it takes about ten days. Some of the factors that may enhance transmission include non circumcision in men, working in the commercial sex industry, and pregnancy due to lowered immunity.

Signs and Symptoms

There are several signs and symptoms of chancroid. Male patients may complain of painful
ulcers on the penis, which may be single or multiple. In a circumcised male patient, the ulcer is usually on the glans penis, the shaft, or the coronal sulcus. In uncircumcised males the ulcer may be either within the mucosal surface of the prepuce, on the skin surface, or on the edge of the prepuce. It may also appear on the frenulum, coronal sulcus, glans penis, or the shaft of the penis.

Chancroid ulcers are painful and it is this pain, which makes the patient seek medical attention. Men always show symptoms if infected but women may be carriers of the disease for sometime before they show symptoms. In women, the ulcers are often painless.

In both sexes, the ulcer may be single or multiple. They are dirty looking with irregular margins. The base of the ulcer is covered by yellow grey necrotic purulent exudates. The

ulcer is very friable and bleeds easily on touch or any form of manipulation. Inflammation of the inguinal glands (adenitis) and bubo formation are more common which spontaneously release thick, creamy pus.

Diagnosis
To diagnose genital ulcers, you start with history obtained from the patient where they report the presence of ulcers on the genital area. You should then examine the patient to check on the location of the ulcers, how many there are, and what the ulcers look like, to differentiate from ulcers caused by syphilis or herpes. Laboratory investigations should also be undertaken to confirm the diagnosis by isolating the causative organisms.
The management of GUD will be studied together. Meanwhile we discuss the complications a patient with chancroid may develop if untreated or if treatment is delayed.

Complications

Chancroid may present with either acute or chronic complications, which usually occur at the site of the ulcer.

Table of chancroid complications.

	Acute Complications	**Chronic Complications**
Male	Oedema and swelling of prepuce Phimosis Balanitis or inflammations of glans penis Inguinal buboes	Secondary warts Fibroses Cicatrization or auto amputation of the penis
Female	Oedema of vulva Vaginal and/or rectal bleeding Buboes	Fibrosis Secondary wartsRecto-vaginal scarring Chronic ulceration

Syphilis

As mentioned earlier, syphilis is one of the infections that cause genital ulcers but it is different from chancroid in that it follows serious disease stages as it advances. Also the mode of transmission is slightly different, although the main mode is sexual contact.

Causative Organisms
A spirochete organism called treponema pallidum causes syphilis. As you already know, the most common mode of transmission is sexual contact. However, it can also be transmitted from the mother to the unborn baby. This is known as vertical transmission and may lead to congenital syphilis. It also can be acquired by coming into physical contact with a patient in the secondary stage of infection that has mucosal or cutaneous lesions and through blood transfusion.

Syphilis can be transmitted through:

- Sexual contact
- Blood transfusion
- Vertical transmission
- Physical contact

The clinical features will depend on the stage of infection the patient presents himself or herself in. As mentioned earlier, there are four stages of syphilis namely primary, secondary, latent and tertiary.
The stages of infection will be addressed individually.

Primary Syphilis
After an incubation period of 10 to 90 days, a primary chancre develops at the site of inoculation. The chancre is typically painless, indurated with a clean base and raised edges and does not bleed on contact, although it oozes clear fluids containing Treponema pallidum. At this stage there is usually one lesion. In a female the chancre is on the cervix or the vulva, while in the male the lesion is most commonly on the glans penis, the foreskin, and the coronal sulcus or on the penile shaft. The primary chancre resolves spontaneously if left untreated over several weeks but disease progresses to the secondary stage.

Secondary Syphilis
This stage follows a few weeks or months after the appearance of the primary chancre. It is during this stage that the micro-organisms begin

to affect other systems in the body. Also, it is at this stage that signs and symptoms become manifest. These include skin rashes that take different forms like papular, macular or pustular. In moist areas of the body, soft, raised condylomata lata may be seen. These condylomata lata do not itch.
There may also be patches on the mucous or oral ulceration, sometimes referred to as snail track ulcer. Also, in addition to its cutaneous manifestation, secondary syphilis may present with fever and general malaise as a result of systemic illness. There could also be generalised lymphadenopathy, nephritis, hepatitis, meningitis or uveitis. These lesions generally resolve after several weeks but the disease progresses to the next stage.

Latent Syphilis
In the absence of adequate treatment, the disease enters in latent stage. At this stage there are no clinical manifestations but there is history of syphilis and a blood test will give positive serological evidence. This patient is liable to develop tertiary syphilis in the future.

Tertiary Syphilis
This is the last stage and it accounts for the morbidity and mortality of syphilis. It begins during the third to fifth year of disease and sometimes it takes an extended period of time to manifest. Lesions of tertiary syphilis fall into three categories, namely, gamma, cardiovascular disease, and central nervous system disease.
Gamma Lesions

The gamma lesions are painless ulcers with little or no inflammation, which sometimes affect bones, making them fragile.

Cardiovascular lesions

The lesions affect the aorta and may cause aortitis or aortic valve disease. They also cause coronary
ostial occlusion.

Neurological lesions

The micro-organisms cross the blood brain barrier to reach the cerebrospinal fluid (CSF) and cause symptomatic neurosyphilis, presenting as epilepsy, hydrocephalus, general paralysis of the insane, syphilitic meningo-encephalitis, cranial nerve palsy or dementia. There could also be asymptomatic neutrosyphilis where the patient is clinically normal, yet the cerebral spinal fluid (CSF) shows the presence of treponema pallidum.

Congenital Syphilis
As mentioned earlier if an infected pregnant woman is not treated, she is likely to pass the infection to the foetus in utero through the placenta barrier and therefore, the baby will be born already infected. This type of disease is referred to as congenital syphilis and is acquired through vertical transmission. Signs of congenital syphilis in a neonate include syphilitic pemphigus, (which is highly contagious) anaemia, jaundice, hepatospleenomegaly, cleft lip and cleft palate. In addition, there may be ulcers of the nasoperiosteum leading to watery nasal discharge.
The babies are born small and they do not thrive well. At birth the baby might appear normal but later develops the characteristic rash affecting the soles and palms, then persistent nasal discharge, which is sometimes blood stained. This progresses to anaemia, jaundice and hepatospleenomegaly. The prognosis is poor but the few who live longer or reach adolescent age develop late congenital syphilis, which is like tertiary syphilis in adults. Those who reach this stage, manifest in bone and dental abnormalities, and inflammatory lesions of the cornea (interstitial keratitis).

Diagnosis
This will start with the history given by the patient. It is followed by a physical examination. This may reveal an ulcer in the genital region suggestive of syphilis but clinically it could be impossible to distinguish syphilitic primary chancre from other genital ulcers. This is why you should use the NASCOP Syndromic Flow Chart for Genital Ulcer Disease to treat all genital ulcer diseases. However, if there is no improvement, you should refer the patient for further investigation. In serological diagnosis, that is, blood tests, you may receive positive results, which are normally reported as VDRL, which is Venereal Disease Research Laboratory Test. This will indicate the presence of treponema antibody, but in vertical transmission, a positive maternal test gives sufficient reason to start the neonate on treatment.

Genital Herpes

Genital herpes is an ulcerative sexually transmitted disease caused by the herpes simplex virus type 2 (HSV2. HSV1 causes oral herpes). The incubation period ranges from two to seven days. The disease can also be transmitted through close physical contact with infected body fluid or from mother to the unborn baby, that is, vertical transmission.

Clinical Features

Localised clusters of vesicles, which break down to form ulcers are the main clinical features. These ulcers crust over and then resolve. Areas involved include external genitalia and neighbouring skin, urethra, cervix and rectum. Sometimes tender lymphadenopathy may occur. During the primary attack, the virus ascends the peripheral nerves to local ganglia where latency is established. The nerve damage is made worse by periodic recurrences of the disease, which continues for the remainder of the patient's life. Nevertheless, primary attack is more severe than subsequent episodes, with the lesions covering a wider and more symmetric area.

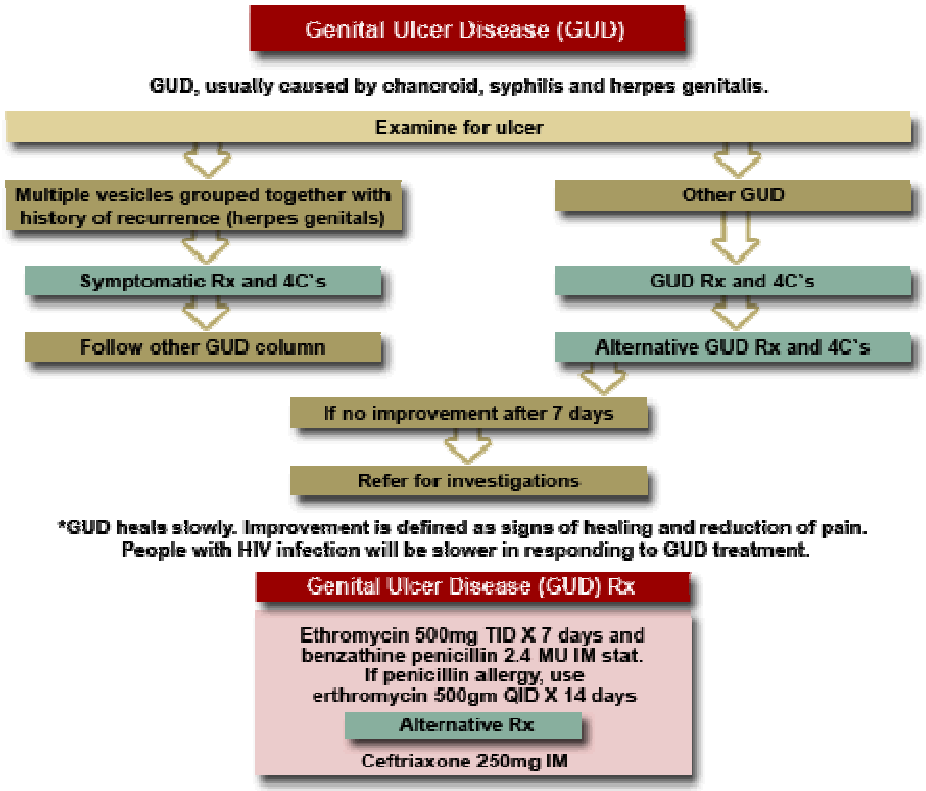
Diagnosis

To make a diagnosis, go by the history obtained and the clinical features start the patient on the treatment using the NASCOP Syndromic Flow Chart for Genital Ulcer Disease. However, if there is no improvement, you should refer the patient for further investigations where viral isolation will be done.

Complications of the genital herpes include:

- Sacro radiculomyelopathy, which may manifest with constipation, retention of urine and shooting pain down the legs. This neuritic pain is particularly troublesome in recurrent disease.
- Excruciating urethritis in women.
- Aseptic meningitis.
- Extra genital lesions.
- Yeast vaginitis.
- Disseminated herpes.
- In pregnancy, recurrences are more frequent and in a primary attack premature delivery may occur.

NASCOP Syndromic Flow Chart for Genital Ulcer Disease



Management of Genital Ulcer Diseases (GUD)
The three main diseases that present with genital ulcers have very serious complications for the patient as well as affecting other members of the family. Therefore, treatment needs to be started as soon as you notice the ulcers, without waiting for laboratory tests, which might take a long time.
According to the NASCOP Syndromic Flow Chart for Genital Ulcer Disease, if a patient is suggestive of having chancroid, syphilis or herpes simplex he/she should be started on erythromycin 500mg
three times a day for seven days and benzathine penicillin 2.4 MU IM stat or if allergic to penicillin, use erythromycin 500mg qid for 14 days instead of ten days. Review the patient after seven days and, if there is no improvement, give him/her the second line treatment, which is ceftriaxone 250mg orally stat. Then review them again and if, once again, if there is no improvement, refer the patient for further investigation. Pregnant women should be referred for further investigation and obstetric evaluation.
While treating the patient, you need to know that treponema pallidum, which causes syphilis, is a slow dividing organism and it responds well to penicillin, and that is why benzathine penicillin is in the first line treatment.
If adequately treated, syphilis can be cured. For congenital syphilis, the baby should be treated with procaine penicillin 50,000 units/kg/body weight, intramuscularly once a day for ten days. Chancroidal ulcers respond well to sulphonamide, and that is why erythromycin is given as first line treatment but if the strains are resistant to sulphonamide, then ciprofloxacin is given as second line treatment.
Being a viral infection, herpes has no cure. However, because it is difficult to distinguish accurately herpes ulcers from other types, treat as per the flow chart for GUD and also put the patient on pain relieving drugs if the ulcers are painful.
Over and above the therapeutic treatment, the patient with genital ulcers should be advised to keep the infected areas clean and dry. The use of saline water to clean the ulcers is recommended. If buboes are present, you should aspirate them in a health facility, using a septic technique. If oedema has caused phimosis, circumcision is advised.
To prevent spread and discomfort, the patient should avoid sexual intercourse, but if it is impossible, then condom use should be emphasised. Also, contact tracing for treatment is important to avoid re-infection once cured.
The time it takes for the ulcer to heal is proportional toits size.

Opthalmia Neonatorum

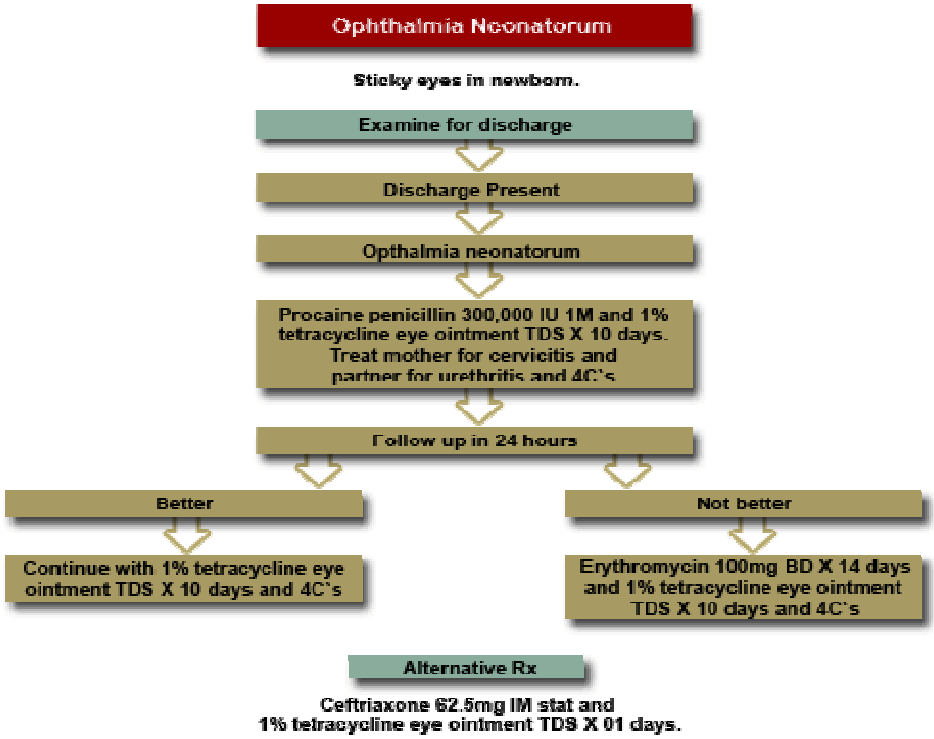
Opthalmia neonatorum is defined as an acute conjunctivitis occurring in the first month of life. Causative organisms are neisseria gonorrhoeae or chlamydia trachomatis. The micro organisms are found in the vagina of an infected individual and as the baby passes through the birth canal during the process of birth, they pick up the infection. Occasionally, the infection is transmitted even to infants delivered by caesarean section when there has been prolonged rupture of membranes. Opthalmia neonatorum presents as an acute bilateral purulent conjunctivitis. It presents with:

- Purulent discharge from the eyes of a newborn any time within 21 days of life. In the early stages, the discharge causes the eyelids to stick together. Later, the pus is thick and greenish in colour.
- The conjunctiva may be red and swollen due to the inflammation.

Gonococcal infections frequently present within the first week of life and may lead to blindness

Diagnosis
Diagnosis is mainly based on the presence of discharge in the eyes and then confirmed by laboratory investigations where the causative organisms will be isolated. Also, if the mother is infected, then it is obvious that the baby is infected and treatment has to be started right away.

NASCOP Syndromic Flow Chart for Opthamnia Neonatorum



Management

Once the discharge is noticed, the baby should be started on treatment immediately because any delay will risk loss of sight forever. Thus, even before referral for laboratory investigation to isolate the causative organism, start the baby on procaine penicillin 300,000 IU IM stat, and 1% tetracycline eye ointment three times a day as first line treatment.

If the baby shows improvement within 24 hours, then continue with tetracycline eye ointment for ten days. However, if there is no improvement after 24 hours, change the treatment to erythromycin 100 mg twice a day for 14 days. Tetracycline eye ointment continues for the prescribed period. Stress on contact tracing where both the mother and her sexual partner will be treated. You should also advise them to abstain from sex until adequately treated to avoid reinfecting each other and especially the baby. If they cannot do without sex, respect that and teach them on proper condom use.

A delay of treatment for more than four hours significantly increases the risk of opthalmia neonatorum.

Complications

Untreated opthalmia neonatorum results to corneal ulceration, which subsequently leads to partial or total blindness.

Prevention

Looking at the complications the infected baby might develop, all efforts should be made to prevent opthalmia neonatorum. During the antenatal period all women having vaginal discharge should be detected and treated before delivery. Also, their sex partners should be treated to avoid reinfection. At birth the baby should be given prophylactic tetracycline eye ointment immediately. The eyes should be cleaned using normal saline before instilling the eye ointment. It is the government policy that all babies should get the eye ointment to make sure no baby goes unprotected because at times the state of the mother is not known.

SECTION 2: HIV/AIDS

Introduction

This section will focus on HIV/AIDS. There are numerous frequently asked questions about HIV/AIDS, these include:

- What is HIV and AIDS?
- What causes HIV/AIDS?
- How is HIV/AIDS transmitted?
- What are the signs and symptoms of HIV/AIDS?
- What is the difference between HIV and AIDS?
- What is the connection between HIV infection and other STIs?
- What is meant by the term 'full blown' AIDS?

Good information is still the best cure for HIV/AIDS. You therefore, need to equip yourself with up to date information to enable us to answer these questions correctly, and provide quality care to your patients, and offer support to their families as well as to the community.

HIV/AIDS is a leading cause of death in sub-Saharan Africa. The pandemic is causing great suffering, not only to the infected individual, but also to the family members (affected) and to some extent the wider community.

The pandemic was declared a national disaster in Kenya in 1999. The immediate past five year reproductive health (RH) program (1999 to 2003) contributed to high level advocacy of overall efforts to highlight the disaster the HIV/AIDS has become. The ongoing five year RH program (2004 to 2008) continues with this high level advocacy. Some of the most pressing issues discussed in relation to HIV/AIDS include:

- The issue of children orphaned by HIV/AIDS.
- Support for pilot prevention of mother to child transmission (PMTCT) projects with an emphasis on community mobilisation for continued breastfeeding, voluntary counselling for testing (VCT) and provision of antiretroviral drugs (ARVs).
- Revision of AIDS education materials to include a life skills program with emphasis on the HIV/AIDS education strategy.

Global Summary of the HIV/AIDS Epidemic - December 2003

HIV/AIDS Introduction

Number of people living with HIV/AIDS	**Total**	**40 million (34 - 46 million)**
	Adults	37 million (31 - 43 million)
	Children under 15 years	2.5 million (2.1 - 2.9 million)
People newly infected with HIV in 2003	**Total**	**5 million (4.2 - 5.8 million)**
	Adults	4.2 million (3.6 - 4.8 million)
	Children under 15 years	700,000 (590,000 - 810,000)
AIDS deaths in 2003	**Total**	**3 million (2.5 - 3.5 million)**
	Adults	2.5 million (2.1 - 2.9 million)
	Children under 15 years	500,000 (420,000 - 580,000)

The ranges around the estimates in this table define the boundaries within which the actual numbers lie, based on the best available information. These ranges are more precise than those of previous years, and work is under way to increase even further the precision of the estimates that will be published mid-2004.

Objectives

By the end of this section, you will be able to:

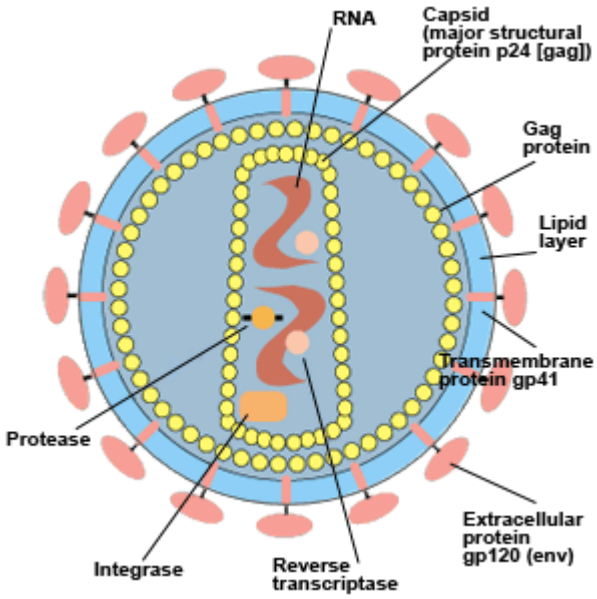
- Explain the causes of HIV/AIDS
- Describe the stages of the AIDS disease
- Describe the management of AIDS patients
- Explain the effects of HIV/AIDS

Cause of HIV/AIDS

HIV is the virus that causes AIDS. HIV stands for Human Immuno-Deficiency Virus. This is the virus that destroys the human immune system, leaving the body defenceless hence vulnerable to other infections. It is of interest to note that HIV is a member of a group of viruses called retroviruses, which cause immune deficiency in both animals and humans. Those that affect humans, are HIV1 and HIV2, the commonest being HIV2.

When the virus enters the body and gets into the blood stream, it binds itself to specific defence cells known as CD4 lymphocytes and as it enters these cells, it destroys them. When the retrovirus enters the CD4 cell, an enzyme from the virus called reverse transcriptase takes over the cell's genetic equipment to produce more retroviruses which are released outside the infected cell and go on to infect other CD4 cells. This process goes on

over a period of years during which the number of CD4 lymphocytes gradually decreases. Please note; that although the body of an infected person struggles to form antibodies against the HIV, these antibodies cannot destroy all the viruses because they keep on multiplying and the body's defence system is being depleted, therefore, it becomes unable to produce enough antibodies to match the viruses.



Having discussed HIV, now move on to look at what AIDS means.

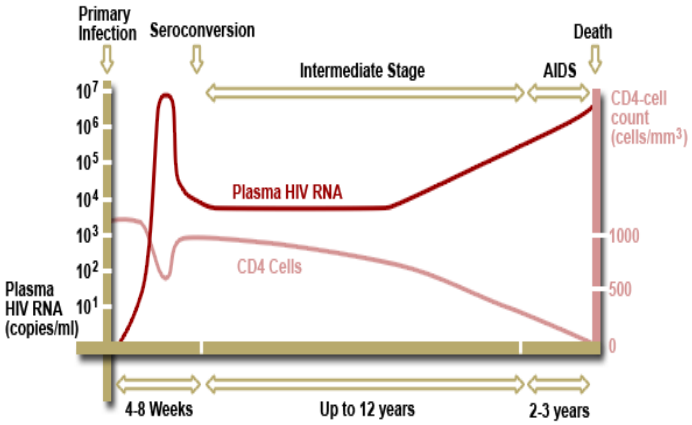
AIDS is an abbreviation for Acquired Immune Deficiency Syndrome.

Immune deficiency has previously been mentioned in the process of explaining what HIV means. Now, the questions you may ask yourself are: Why is it acquired and why is it a syndrome?

First of all, it is acquired and not inherited, the HIV virus is spread from one person to another.

Secondly, the disease presents with a collection of signs and symptoms resulting from lowered immunity due to HIV and that is why it is referred to as a syndrome (a syndrome is a group of signs and symptoms denoting a disease).

As the HIV virus multiplies, more immune cells (CD4) are destroyed, interfering with the individual's immune system. Once the immune system cannot function properly, then the person may be infected by many bacteria, viruses and parasites, which the person's immune system is no longer able to fight. These infections are referred to as opportunistic because they take advantage of the opportunity offered by the lowered immunity.



Therefore, a collection of signs and symptoms caused by infections and other complications arising from HIV infection is referred to as AIDS. AIDS occurs when the human immune system becomes severely weakened, a process, which might take three to ten years, and this leads to life threatening conditions.

Positive test result confirms the HIV infection except in children below 18 months old because the baby might have acquired the antibodies from the infected mother and not the virus. From what you have seen in the course of your duty or read from the newspapers, you will agree that

the Acquired Immune Deficiency Syndrome (AIDS) has become an extremely serious problem in Kenya and the world over. AIDS is causing devastating health, socio-economic and development problems.
You will now move on to find out how this disease is acquired and how it spreads.

Mode of Transmission

HIV infection is primarily a STI (Sexually Transmitted Infection) because it is mainly transmitted through contact with infected body fluids (semen, vaginal and cervical secretions, blood and blood products) usually during sexual intercourse, but sometimes through activities such as breastfeeding, skin piercing practices, blood transfusion, organ transplants, drug injections, circumcision and other operations. The most likely mode of transmission includes:

- Blood and blood products
- Semen
- Vaginal secretions
- Breast milk

You will now look at some of the activities that encourage HIV transmission.

Unprotected Sexual Contact
This includes vaginal and anal sexual intercourse. Both in the genitalia and the rectum, HIV may infect the mucous membranes directly or enter through cuts or sores caused during intercourse (many of which would be unnoticed). Vaginal and anal intercourse is a high risk practice. Ulcerations arising from infection with other sexually transmitted diseases such as syphilis, chancroids or gonorrhoea allow the virus to enter the body easily during sex. Therefore, the presence of other STIs increase the risk of HIV transmission.

Direct Blood Contact

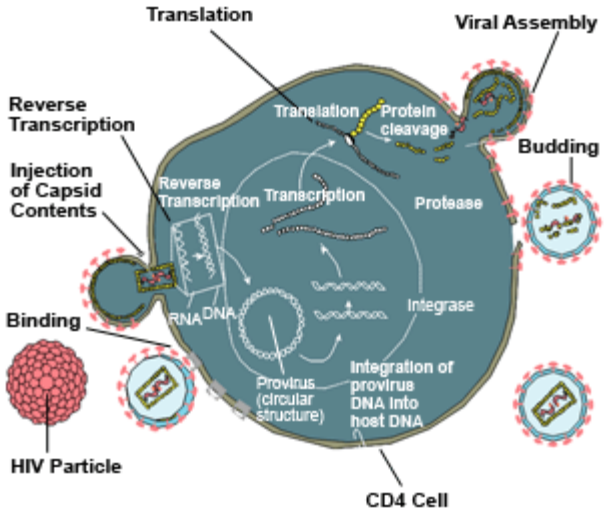
This includes, blood and blood products, sharing drug injecting needles and injuries by sharp instruments. Transmission through blood occurs when a person is transfused with unscreened blood from an infected donor. It can also occur when one comes into contact with contaminated blood or blood products through contaminated needles, syringes, razor blades, or sharp objects used either for circumcision or skin piercing or scarification for beauty.
Sometimes one may come into direct contact with infected blood during an emergency, for example, when assisting accident victims or in childbirth.
Sharing of injection needles is a common practice among drug abusers. An injection needle can pass blood directly from one person's blood stream to another. Sharing a circumcision knife is another common practice by traditional circumcision practioners. These are very efficient ways to transmit a blood borne HIV. These practices are considered to be a high risk behaviour.

Mother to Child
It is possible for a HIV infected mother to pass the virus directly during pregnancy through the placenta barrier, during childbirth, or through breast milk. Breast milk contains HIV, and while small amounts of breast milk do not pose a significant threat of infection to adults, it is a viable means of transmission to infants.
Now that you know the most important modes of HIV transmission, it is equally important for you to know how HIV is not transmitted. The following factors are not associated with HIV transmission:

- Casual contact such as shaking hands
- Sharing eating utensils
- Social contact such as sharing the same room or transportation facility
- Bites by anthropoid vectors

Progression of the HIV Infection

When the virus enters the body and gets into the blood stream, it binds itself to specific defence cells known as CD4 lymphocytes. When the retrovirus enters the CD4 cell, an enzyme from the virus called reverse transcriptase takes over the cells genetic equipment to produce more retroviruses which are released outside the infected cell and go on to infect and destroy other
CD4 cells.
This process goes on over a period of years during which the number of CD4 lymphocytes gradually decreases. Please, note; that although the body of an infected person struggles to form antibodies against the HIV, these antibodies cannot destroy all the viruses because they keep on multiplying and the body's defence system is being depleted and is, therefore, unable to produce enough antibodies to match the viruses.

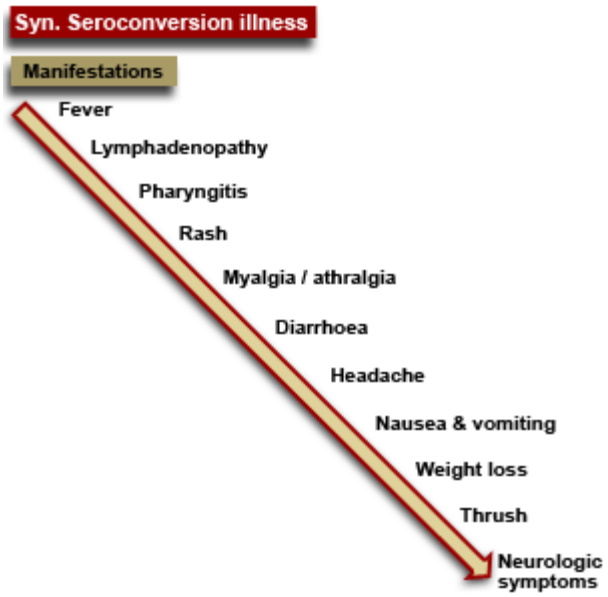


The time it takes for a person who has been infected with the HIV to seroconvert (test positive) for HIV antibodies is commonly called the
'window period'.
According to NASCOP, when a person is infected with the HIV virus, statistics show that 95-97% (perhaps even higher) of all infected individuals develop detectable antibodies within 12 weeks (three months).
The Centre for Disease Control and Prevention (CDC) has said that in some rare cases, it may take up to six months for one to seroconvert (test positive). At this point the results would be 99.9% accurate.
It is important to note that, during the window period, the infected person is infectious despite negative results. This contributes to the high rate of spread since the infected persons will transmit the virus to the sexual partner(s) or from mother to child without realizing it. Therefore, HIV infection is only confirmed after an infected person has developed antibodies and goes through a HIV antibody test. Positive test results confirm the HIV infection except in children below 18 months old because the baby might have acquired the antibodies from the infected mother and not the virus.
According to the Centre for Disease Control (CDC), the average time between HIV infection and appearance of signs that could lead to an AIDS diagnosis is eight to ten years. This time varies greatly from person to person and can depend on many factors including the person's health status and sexual behaviour.
Once an adult develops AIDS, the time of death varies from a few months to about two years if no antiretroviral treatment is given. In children (mother to child transmission) the progression is faster and the majority die within the first three years of life and few live up to ten years.
Today, there are medical treatments that can slow down the rate at which HIV weakens the immune system. There are other treatments that can prevent or cure some of the illnesses associated with AIDS, especially opportunistic infections. As with other diseases, early detection offers more options for treatment and preventive
health care.
For the purpose of clinical management, all individuals diagnosed as HIV positive should be classified according to the disease stage. As you may be aware, HIV infection has four stages of progress and each stage has specific signs and symptoms.

Stages of HIV/AIDS

Stage 1: Acute Infection (Acute Seroconversion Syndrome)

This is the first stage of HIV infection, when the virus establishes itself in the body. Some researchers use the term Acute HIV Infection (acute seroconversion syndrome) to describe the period of time between when a person is first infected with HIV and when antibodies against the virus are produced by the body (usually six to twelve weeks).
Some people newly infected with HIV will experience some 'flu like' symptoms (sometimes called sero-conversion illness). These symptoms, which usually last no more than a few days, might include fever, chills, night sweats, rashes, joint and muscle pain, swollen lymph glands, diarrhoea or some sore throat (not cold like) symptoms.



HIV Disease Stage

WHO Stage 1		**WHO Stage 4**	
Asymptomatic HIV Infection	O	Candidiasis (Esophageal, Bronchi, Trachea or Lungs)	O
Persistent Generalised Lymphadenopathy (PGL)	O	Cryptococcosis, Extrapulmonary	O
WHO Stage 2		Cryptosporidiosis with diarrhaea (> 1 month duration)	O
Herpes Zoster (within last 5 years)	O	Cytomegalovirus Disease (other than liver, spleen, lymph nodes)	O
Minor Mucocutaneous Manifestations	O	Herpes Simplex (mucocutaneous > 1 month or visceral any duration)	O
Recurrent Upper Respiratory Tract Infections	O	HIV Encephalopathy	O
Weight Loss ≤ 10% of Body Weight	O	HIV Wasting Syndrome	O
WHO Stage 3		Kaposi's Sarcoma (KS)	O
Severe Bacterial Infections (ie pneumonia, pyomyositis)	O	Lymphoma	O
		Atypical Mycobacteriosis, Disseminated	O
Oral Candidiasis (Thrush)	O	Mycosis, Disseminated Endemic (ie Histoplasmosis, Coccidiodomycosis)	O
Unexplained Chronic Diarrhaea (> 1 month)	O		
Unexplained Prolonged Fever (intermittent or constant, 1 month)	O	Tuberculosis, Extrapulmonary	O
		Pneumocystis Carinii Pneumonia (PCP)	O
Oral Hairy Leukoplakia	O	Progressive Multifocal Leukoencephalopathy (PML)	O
Tuberculosis, Pulmonary (within previous year)	O	Salmonella Septicemia, Non-typhoid	O
Weight Loss > 10% of Body Weight	O	Toxoplasmosis, CNS	O

Other people either do not experience 'acute infection' or have symptoms so mild that they may not notice them. This is the window period. In any case, the symptoms are mild and disappear in a few weeks, frequently giving rise to the assumption that the illness was only a cold or flu.

During this period the virus is multiplying inside the infected person's body and can be passed on to others, but the usual HIV test (an antibody test) will produce a false negative report, since it

takes approximately two-three months for an infected person to develop antibodies against HIV after which the HIV antibody test will be positive.

Stage 2: Latent or Asymptomatic Period (Asymptomatic HIV Infection)

After the acute stage the HIV infection remains latent (in the body) usually for a period of up to 10 years. Throughout this period the person stays
infected and infectious, but is unlikely to be aware
of his/her status unless he/she has been tested for HIV.

During this period, the infected person feels and appears healthy and has no symptoms, which suggest HIV infection.

The immune response of an infected person is able partially to suppress the HIV virus during this stage so that the amount of virus in the body and bloodstream is very much reduced (although the virus is not eliminated) but throughout the asymptomatic period there is progressive damage to the person's immune system as it tries to control the virus. This is demonstrated by a steady decline in the number of CD4 cells in the blood (CD4 count). Some people will have persistently enlarged lymph nodes or persistent generalised lymphadenopathy (PGL).

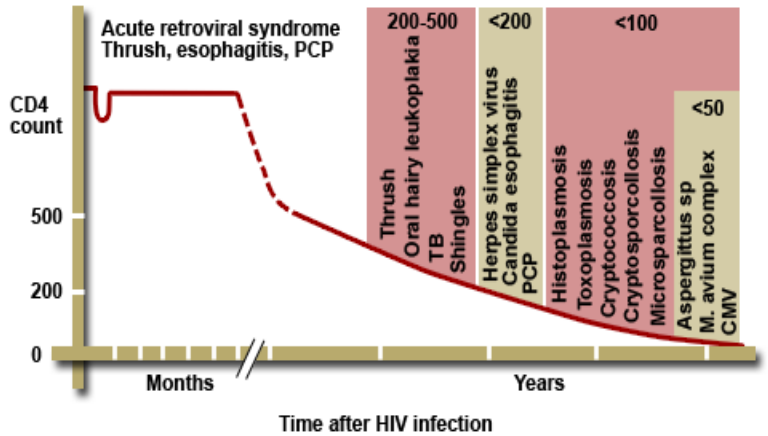
During this latent period, the person is infective and the HIV virus can be detected in various body fluids and lymph nodes. Also, the HIV antibody can be demonstrated in the blood serum.

Stage 3: Symptomatic HIV Disease

Eventually, many individuals develop a variety of indicators of ill health. As you may have already noted, weight loss and general weakness (asthenia)
are the most common clinical manifestation in patients with HIV infection. Generally, the patient presents with the following signs and symptoms, which suggest that the HIV virus is beginning to affect the immune system, though at this stage it is
not yet as bad as when the person has developed
the actual AIDS disease (full blown AIDS).

The symptoms may include swollen lymph glands, joint and muscle pains, sore throat, fatigue, fever, night sweats and diarrhoea. Generally, these symptoms may come and go intermittently over a period of weeks or months, but you will notice that lymphadenopathy involving two or more extra inguinal sites is found in the majority of HIV positive patients. Lymphadenopathy occurs most frequently in the cervical and axillary regions. Lymph nodes are firm, mobile, non-tender and generally do not exceed six cm in diameter. Lymph nodes larger than six cm in diameter in HIV infected patients are often of a tuberculosis origin.

Mucocutaneous manifestations are also common in patients with HIV infection. A characteristic generalised papular parasitic eruption is found in approximately 20-60% patients with HIV infection, which is often seen in the early stages of illness but is generally found intermittently throughout the course of the disease though its aetiology is unknown.



The initial lesion is a small firm and very pruritic papule, which releases a small drop of fluid when scratched. The papules become hyper pigmented macules. They are symmetrically distributed over the body, but are most frequently found on the extremities. Histological features are non-specific and include perivascular infiltration of the skin and subcutaneous tissue with mononuclear cells with a variable number of eosinophils.

Recurrent mucocutaneous herpes simplex infections are found in 5-10% of patients with HIV infection. Over 10% of patients with HIV infection experience a varicella Zoster infection, which is recurrent in one-quarter of the cases. The initial episodes of varicella Zoster infection are often the first manifestations of HIV-associated illness.

Oral candidiasis in the absence of antimicorbial immunosuppressive therapy or an immunosuppressive illness is highly associated with HIV infection. Its occurrence in an HIV-positive patient is often a bad prognostic sign and an indication of progression towards 'full-blown' AIDS.

Stage 4: AIDS or Late HIV Infection

This is the final stage of HIV infection.

AIDS is the final stage of HIV infection. It occurs when HIV has destroyed vital aspects of the immune system leaving the body vulnerable to life threatening infections, which eventually lead to death. You may have nursed or seen an AIDS patient in this stage.

You will now look at some of the life threatening diseases, which manifest during this stage since signs and symptoms depend on the opportunistic infection, which sets in.

There are no common symptoms for individuals diagnosed with AIDS. When the immune system damage is more severe, people may experience opportunistic infections (called opportunistic because they are caused by organisms which take the 'opportunity' of the weakened immune system to flourish in people with HIV infection). Most of these more severe infections, diseases and symptoms fall under the Center for Disease Control and Prevention's definition of 'full blown AIDS'.

You will find that these opportunistic infections generally result from reactivation rather than from primary infection.

The predominant clinical presentation of AIDS is diarrhoea (wasting syndrome). Patients may lose several litres of liquid stool a day, sometimes leading to severe dehydration. The cause of this secretory diarrhoea is not known and established intestinal pathogens like cryptosporidium parvum, microsporidia and Isospora belli can be detected in only a minority of patients with HIV/AIDS. Also, fever of unknown origin is a very common symptom. It may be due to endemic infections unrelated to the underlying HIV infection, for example, malaria. Additionally, the patient might develop pneumonia, Haemoptysis and pleural effusion, which is mainly caused by tuberculosis or Kaposi's sarcoma. You may also find that Neurological syndromes such as chronic and acute meningitis, myelopathy, encephalopathy with dementia and peripheral neuropathy complicate the clinical course of AIDS.

Diagnosis of AIDS

The diagnosis of AIDS is initially clinical, based on the opportunistic infections identified or other factors suggestive of HIV/AIDS like if the patient has multiple sex partners, or a sex partner known to have HIV/AIDS. Other factors include history of recent genital ulcer disease or any STI, blood transfusion or any surgical procedure with unsterilised instruments. A serological test is used to confirm the infection through HIV antibody detection. Although the serological results may be positive, the test is repeated three times, using different types of preparation according to the World Health Organisation (WHO) recommendations.

You will cover voluntary counselling for HIV testing later under VCT. For now, you will look at the stages of HIV testing.

The patient must be counselled and their consent has to be obtained before the blood test is done. Post test counselling should also be given.

Stages of HIV Testing

At first, blood is tested with ELISA or rapid/simple assay, which reacts with blood serum if the HIV antibodies are present. If no HIV antibodies are present, then there is no

reaction and, therefore, the person is HIV negative. For those that are positive (or there is a reaction) the test is repeated with a second ELISA or Rapid assay based on a different antibody preparation. If there is serum reaction it means the test is positive. If there is no reaction it is considered negative. For those that are positive, the test is repeated again with ELISA or rapid assay but based, once again, on different antigen preparation. If it reacts, then it is considered positive and if there is no reaction it is considered negative.

Please note; that serum reactive at all the three levels of testing is considered HIV antibody positive while serum that is non reactive on the first testing is considered HIV antibody negative. Serum that is reactive on first test but non reactive during the second testing is HIV antibody is negative.

If blood serum that is reactive (HIV antibody positive) in the first and second testing but non reactive (showing HIV negative results) in the third test, is considered to be borderline or equivocal, therefore the test is repeated and if the results are equivocal again more blood sample is obtained after two weeks interval and the whole exercise is repeated all over again.

The blood is tested from levels/stages one, two and three and if the results are equivocal again, the person is considered HIV antibody negative but if there is serum reaction then it confirms the disease. Also, in the event of equivocal results, the test for viral nucleic acid (polymerase chain reaction PCR) can be used for confirmation of the serostatus or the Western Blot Assays.

Management of HIV/AIDS

Management of a HIV/AIDS patient is very complex, as you have to deal with physical and psychosocial aspects. The main aim of management is to reduce suffering caused by HIV infections itself and by the opportunistic diseases.

Management of the AIDS patient does not require any special facility except for those with tuberculosis who may be highly contagious. However, contact with mucosal excretions should be avoided by use of gloves.

When talking of management you think about nursing management and drug therapy. The opportunistic diseases weighing the patient down will dictate nursing management. Please refer to nursing management for specific conditions in module one. This leaves drug therapy. There is no cure for HIV infection but antiretroviral therapy can assist the infected individual to live a better life.

You will now look at antiretroviral therapy and goals of therapy, which include maximal and durable suppression of plasma viral load, preservation or restoration of immunology function, improvement of quality of life and reduction of HIV related morbidity and mortality. To achieve these goals there must be maximum adherence to the antiretroviral regimen, rational sequencing of drugs, preserving future treatment options and use of resistance testing in selected clinical settings where possible.

Before you decide to start antiretroviral therapy you should consider the patient's acceptance or readiness and the probability of adherence, though the strength of recommendation is dependent on the prognosis as determined by how far the disease has progressed (the stage of the disease) CD4 (T-lymphocyte) count and viral load (plasma HIV RNA) assessed through laboratory investigations. Also investigations should be carried out to establish factors leading to symptomatology including common opportunistic infections.

The optimal time to initiate antiretroviral therapy is
not known or not decided upon. Thus, you should
weigh the benefits against the risks of early and delayed antiretroviral therapy, you then need to discuss these with the patient before starting the treatment. Now look at the benefits and risks of early or delayed antiretroviral therapy.

Early antiretroviral therapy makes it easier to control
viral replication, it delays or prevents immune system compromise, lowers risk of resistance to the drug if complete viral suppression is achieved,
while the risks include early development of drug resistance thus limitation of future antiretroviral treatment options.

Delayed therapy benefits the patient in that it preserves the maximum number of available and future antiretroviral drugs options when HIV disease risk is highest and delays development of drug resistance. However, it has its own disadvantages. When treatment is started late there are possible risks of irreversible immune system depletion and it is also difficult to suppress viral relocation. With this in mind, you should make the decision on when is the best time to start the treatment basing on when is it likely to benefit the patient most.

Antiretroviral drugs are combined to achieve good results. The antiretroviral drugs are grouped into three different classes according to how they work on the HIV virus. They have been found to provide Highly Active Anti-retroviral Therapy (HAART) when combined properly.You will now study these different classes and how they work. Remember these classes of anti-retroviral therapy are HAART.
The first effective group of anti-retroviral drugs is Nucleoside analogue. They act by incorporating themselves into the DNA of the virus thereby stopping the building process thus the resulting HIV virus DNA is incomplete therefore not effective.The drugs in this category are all oral preparation and are as follows.

Zidonovudine	250	300mg	BD
Didanosine	100	100md	BD
Lamivudine	150mg		BD
Stavudine	30mg	40mg	BD
Zalcitabine	0.75mg		TDS
Abacavir	300mg		BD

The second group of antiretroviral drugs is the Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTI). They work by binding directly onto reverse transcriptase preventing the conversion of RNA to DNA and this stops HIV production. All these drugs are administered orally and are as follows:

Efavirenz	600mg	OD
Nevirapine	200mg	BD
Delavirdine	600mg	BD

The third group is the protease inhibitors, which work at the last stage of the virus reproduction cycle. They prevent HIV virus from being successfully assembled and released. The drugs are administered orally and are:

Sarquinavir	600mg	TSD
Saquinavir	1200mg	TDS
Ritonavir	600mg	BD
Indinavir	800mg	BD
Nelfinavir	750mg - 1200mg	BD
Amprenavir	1200mg	BD
Lopinavir + Ritonavir	400mg	BD

The doses given are for an adult.

Doctors prescribe the drugs but you need the knowledge to assist in decision making and administering of the drugs. Remember, you are an active member of the caring team.

Patients on antiretroviral therapy need close monitoring so that drugs can be changed if need be.
The CD4 cell count is a laboratory marker of the strength of one's immune system, (normal adult range is 500-1800 cells per cubic millimetres of blood volume) and is used to determine the progress
of HIV disease and predict the risk of developing complications. During this time nursing care and counselling services should be availed continuously
to the patient. Nursing care will be discussed under
home-based care, so now move on to look at counselling in detail.
Management of the HIV/AIDS patient is complex. It is this complexity that makes the counselling of such a patient difficult depending on the level (stage of the disease) you meet the patient or the purpose for which counselling is being conducted. For the already diagnosed case, counselling should take care of physical, psychological and socio-economic issues. Thus, in most cases you will do as much you can as a nurse then refer the patient to the trained counsellors who are equipped with the knowledge, skills and attitudes to face the challenges of HIV/AIDS counselling.
In the management of HIV/AIDS there is pre and post counselling. It is government policy that every patient should be counselled before undergoing and an AIDS test and before receiving test results. As a rule, all patients undergoing an HIV test should do so after adequate pre-test counselling. They should be informed of the nature of the test and the meaning and consequences of a positive result.
There are different reasons for HIV testing, for example, an asymptomatic individual test is often made as a result of a test solicited for routine
medical examination required by insurance schemes, employers or for travel purposes while a symptomatic test may be taken as part of medical investigations. I hope you remember the difference between symptomatic and asymptomatic stages. Please check up if you have forgotten.
Post testing counselling forms an integral part in the process of giving back HIV test results. This

will be discussed in details under Voluntary Counselling and Testing VCT.
As you have seen earlier, HIV positive results confirm the diagnosis. Once that is done, the patient should benefit from ongoing counselling and support which will be discussed under home based care.

Voluntary Counselling and Testing
Voluntary counselling and HIV testing (VCT) is an essential component of response to the AIDs epidemic. The campaigns for VCT aim at behaviour change. You know that the first government approach was to create awareness about the seriousness of HIV spread, which has given rise to a high level of awareness but without corresponding behaviour change. Currently the Ministry of Health (MOH) response to the HIV epidemic in the national strategic plan (1999-2004) includes the introduction of voluntary counselling and testing into the public health care system. You might wonder how VCT will assist in 'behaviour change', which is need so badly to avert the spread of HIV/AIDS?
Documented research from many countries has shown that people, who know their HIV status whether negative or positive, drastically change their sexual behaviour. Therefore, it is believed that knowing one's HIV status empowers people to make informed decisions about their sexual lifestyle that would otherwise predispose individuals to HIV infection. It is believed that the majority of Kenyan people do not know their HIV status. So it is this population that VCT targets.
Through VCT, it is possible to identify those infected early for proper care services and the uninfected to be informed on how to remain HIV negative. Therefore, VCT is important in any HIV prevention efforts that have proven to be cost effective. Additionally, VCT serves as entry point for long term supportive services for patients who become aware of their HIV status. VCT can also assist HIV positive patients adopt behaviour that does not transmit the disease to their sexual partner or infants. VCT services can also be entry points for providing other services like detecting and treating tuberculosis, preventing other opportunistic infections in HIV infected persons, and preventing mother-to-child transmission.
You also find that, through VCT those who are HIV positive can be assisted to be open up and start informing their sexual partners, families, community and general population about their HIV status, with an aim of preventing HIV spread. At the same time, they can be helped to make appropriate plans for their future by making informed decisions about certain issues like marriage, pregnancy or sexual relationships. VCT can also provide the opportunity for receiving additional services such as legal assistance, family planning and detecting and treating other sexually transmitted diseases.
You have seen that there are many advantages of VCT and the chances are that it might have an impact in prevention of HIV spread. You will now look at what VCT entails. First and foremost the campaign for VCT aims at motivating people of all cadres to come forward on their own accord to receive the services. So VCT services should be completely voluntary, that is the patient should come and make a request for the service. Then pre-testing counselling is carried out before testing so that the patient can give informed consent for the test.
Confidentiality is maintained at all times. After the test is done, post counselling is also carried out to prepare the patient for receive the results. Therefore, it is mandatory that pre and post test counselling is done with a lot of concentration because it carries the key to success. At any level, counselling should emphasise on behaviour change as a way to prevent transmission.
To succeed in VCT services, counselling procedures should be carried out in a safe and trusting environment where individuals or the couples feel free to express their feelings. There is
need to discuss the window period and the need for retesting especially for those with HIV negative results. It is during counselling where the patient should receive relevant and accurate information about HIV/AIDS hence the need to refer patients to a trained VCT counsellor. Relevant and accurate information help individuals or couple to make informed decisions regarding their health, family planning, child bearing and safer sex
There are some important facts you need to appreciate whilst talking of VCT. For instance, HIV is mostly contracted through sexual intercourse and it can be prevented, HIV is spreading very fast yet there is no cure (antiretroviral drugs only prolong and improve the quality of life), and HIV/AIDS affects everyone.
You will now look at look who benefits from VCT services.

- A person who is serious about behaviour change.

- Those planning marriage or a new relationship.
- Those with more than one sexual partner now or in the past.
- A person who has had a blood transfusion.
- An individual or couple considering a pregnancy or a woman who is already pregnant.
- A person suffering from sexually transmitted diseases especially genital ulcer disease.

The HIV negative individual will benefit from VCT services in that he/she will learn how to remain negative. Couples can marry or plan for future pregnancies without doubt and, above all, testing negative creates powerful motivation towards behaviour change which is the goal of VCT.

SECTION 3: STI PREVENTION AND HEALTH PROMOTION

Introduction

Since there is no cure for HIV/AIDS, efforts should be made to motivate individuals, families and the communities to prevent its transmission. Preventive and control measures primarily depend on the same condition, that is, people's willingness to modify their sexual and health seeking behaviour.

Remember:
STI comprises both STDs and HIV/AIDS.

Objectives

By the end of this section, you will be able to:

- List the most common preventive strategies for STDs and HIV/AIDS
- Describe each strategy

Prevention and Control of STI Transmission

Reducing the prevalence of STIs among the general population requires an understanding of the importance of everyone's effort to accept the responsibility of becoming public health educators concerning HIV/AIDS and other STIs.

Remember:
Whatever steps you take to control/prevent STIs,
you are also controlling HIV transmission.

As explained earlier the various strategies of prevention and control include:

- Syndromic management of STIs
- Laboratory investigations in the management of STIs
- Information, education and communication (IEC) and advocacy for community mobilisation and capacity building

The Role of Syndromic Management in the Prevention/Control of STIs

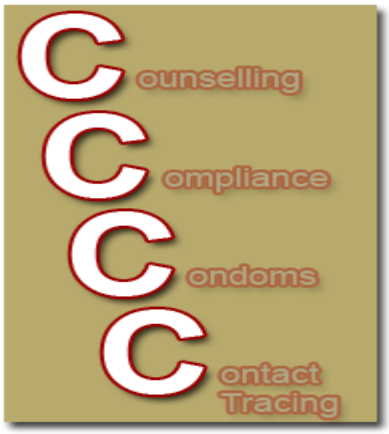
You learnt about syndromic case management in section one of this unit. The role of the syndromic approach in preventing and controlling the spread of STIs cannot be overly emphasised. If the client is treated early and adequately, the spread of the infection does not continue. The exact magnitude of STIs in Kenya is unknown. It is among the five top diseases for which patients seek medical attention, in our health facilities.

Considering the serious consequences of STIs, particularly for women and children, and the increasing evidence that they facilitate the transmission of HIV infection, medical professionals and health planners should accord them high priority. Lack of a well equipped health facility for STI management has led many patients to seek treatment outside the formal health sector. This often involves inadequate management, leading to increasing antimicrobial resistance among sexually transmitted pathogens.

The management of STIs has been constrained by the lack of diagnostic facilities especially in developing countries, of which Kenya is one. To overcome this problem, the WHO has developed a syndromic algorithm to be used in low resource settings. Kenya has adopted this approach. There should be syndromic management flow charts hanging on the walls of your health facility.

The Syndromic Management Approach of STIs, which is thought to be an answer to many obstacles to efficient STI case management (as recommended by WHO), facilitates adequate

treatment. However, to achieve this, health care providers need to be trained on the use of this approach and all health facilities need to be well equipped.
This approach calls for the government to ensure STI drugs are distributed to all health facilities. This should guarantee prompt and adequate treatment for prevention/control of not only the common STIs but, also HIV/AIDS transmission.
Emphasis should be put on the four C's so that infected individuals avoid spreading the infection and also know how to avoid re-infecting themselves. (Remind yourself what the four C's stand for in section one of this unit).



The Role of Laboratory Investigations in STIs Prevention/Control

Laboratory investigations of STIs depend on the facilities available at the health centre and the referral system in place. This should be decided on the principle that a patient with one STI is also at increased risk of another STI. Additionally, it is government policy that all patients be screened for syphilis, and if possible for HIV, after getting their consent.
It is also government policy that all pregnant mothers be screened for syphilis. Thus, all health facilities offering antenatal services should be equipped well enough to provide this service to be able to capture a larger population.
In this regard, all health workers should be trained in counselling so that they can convince patients of the importance of screening. They should also do a follow up to make sure patients testing positive have been treated and the four C's stressed.

The Role of IEC and Advocacy in Community Mobilisation and Capacity Building for STI Prevention/Control

The government has attempted to increase awareness of STI transmission through public health education programmes.
The Ministry of Education has also incorporated sex education in their curriculum, which is aimed at the adolescent and youth.
Awareness appears to have been raised to a level of 90%. However, this high awareness level has not been successful in controlling the spread of infection, as indicated by the rapid spread of HIV/AIDS and the incidence of STIs.
This tells us that knowledge alone is not enough to slow down the spread. Knowledge should be accompanied by behavioural change.
The main mode of transmission of STD/HIV is sexual intercourse, every individual needs to change their sexual behaviour if the campaign is to succeed.
Matters of human sexuality are closely tied to traditional beliefs and cultural practices in the African context that, in themselves, are obstacles to behaviour changes.
The diversity of cultural beliefs and practices among various Kenyan ethnic groups, which play an important role in the spread of STI, include female genital mutilation (FGM), circumcision, tattooing and drug abuse. Such practices should be discouraged through intersectoral actions and collaboration. This is an area where all government ministries have to work together to bring positive behaviour change in all ethnic groups, to slow down the spread of STIs as a way of fighting the HIV/AIDS epidemic.
In our campaign, special groups like the adolescents and youths need to be targeted because they are at greater risk of acquiring STIs. They need to avoid the infection, especially through abstinence or the use of condoms.
Other groups to focus on are commercial sex workers, truck drivers, military personnel and sailors. No sexually active individual is immune to STIs, the type of work of the groups mentioned here place them at higher risk than others. The worst hit group, which needs special attention to be empowered, is women.
Women are the worst hit when it comes to STIs because they are easily lured into sex due to poverty or cultural beliefs. Worse still, married women cannot refuse sex or demand protected sex even when they know their husbands are

having affairs outside the marriage.
The control/prevention campaign should aim at empowering women by equipping them with the skills necessary to negotiate for safer sex.
There is a need to increase awareness of the disease burden attributable to STD/HIV/AIDS among the public, the leaders and vulnerable groups.
To be able carry out this task, all reproductive health care providers should be trained in the prevention, detection, treatment and counselling of STIs/HIV/AIDS patients.
Infection prevention practices should be promoted amongst health personnel and traditional health practitioners. (Revise the section on infection control in module one).

Effects of HIV/AIDS

To understand the seriousness of the HIV/AIDS endemic, you need to look at some of the effects the infection has on the infected and affected individuals, the community and the country at large. HIV/AIDS affects man in totality.
If you have nursed or taken part in caring for an AIDS patient, you will have witnessed the confusion and strain the disease sets on the individual's family, community and even the employer of the infected.
In Kenya, HIV/AIDS has had a significant impact on the socio-economic indicators of well being, such as infant mortality and life expectancy. Also, owing to its rapid spread, the epidemic is likely to reverse the gains previously made in economic development, as well as in social sectors through illness, deaths and diversion of resources to care for the infected and the affected.
The worst hit group is between the ages 15 - 45 because they are more sexually active, this deprives the country of its labour force.
Therefore, HIV/AIDS is worsening the socio-economic situation and the poverty level in Kenya and continues to give a gloomy picture.
It is difficult to exhaust the list of effects of HIV/AIDS to all sectors in detail, so you will look at the most affected ones, and the ones that play a key role in development.

Impact on Health

The health budget has been overstretched by the AIDS epidemic because about 50% of the patients in medical wards are suffering from AIDS and related illnesses, hence the reason for starting home based care programmes. The Ministry of Health is responsible for providing treatment for opportunistic infections as well as antiretroviral drugs to the infected. The Ministry is also involved in many prevention programmes like STD control, condom promotion and distribution, health education and VCT centres, all of which cost money.
In addition, the health sector has seen a resurgence of diseases such as tuberculosis, typhoid and cholera, many of which had almost been contained. It has also been plagued by the emergence of new disease such as highland malaria, Rift Valley fever as well as an increase in case fatality of common disease such as pneumonia. This has been exacerbated by the advent of HIV/AIDS, which threatens to consume over 50% of the public health resources, if this upward trend does not change.
HIV Infection progresses in an individual to produce a variety of increasingly severe problems, which might start with common complaints such as headache and diarrhoea and later more severe opportunistic infections like TB.
This infected individual needs attention in terms of palliative care throughout life, prevention and treatment of opportunistic infections and provision of antiretroviral drugs, which improve the quality of life of people with HIV/AIDS.
Please note that the high cost of management of AIDS patients, puts an extra burden on the Ministry of Health budget and also on the affected family, not to mention the lost wages if the infected person was the breadwinner.
AIDS also affects child survival. About 30 - 40% of babies born to infected mothers will also be infected and most of them develop AIDS and die within two years. Few survive past the age of five years.
HIV infection has brought a rapid increase of new TB cases, a disease that had otherwise been controlled. The impact of HIV infection on tuberculosis is a very serious problem because it is transmitted through casual contact, so it threatens to increase the risk of tuberculosis for the entire population. Also, drug resistant strains of TB are appearing, making it difficult and expensive to treat and control.

Impact on Education

The education system is affected by HIV/AIDS in many ways. Infected teachers cannot perform their duties properly due to ill health and eventually they die, creating shortages.

Many children infected at birth do not even live to enrol in school and those who do, die before going far. Many children also drop out of school when they become orphans due to AIDS impacting on their family, or to take care of AIDS patients at home.

All these factors disrupt learning, making the majority of youth vulnerable to AIDS. However, the education system can be used to disseminate information on HIV/AIDS prevention and this can help young people understand how and why they should avoid the risk of unsafe sex.

Impact on Agriculture

In the agriculture sector, food security is threatened as the country gets deprived of a labour force as AIDS related illnesses and death affects the most productive age group (15 - 45 years old).

This portends a grim picture, especially in rural areas. AIDS has adverse effects on small scale farmers as well as commercial agriculture due to loss of skilled and unskilled labour supply which leads to low labour productivity hence low income to the affected persons and agricultural sector as a whole.

Impact on the Economy

AIDS has the potential to create a severe negative economic impact in Kenya. HIV/AIDS is worsening the socio-economic situation and poverty level in Kenya, and continues to give a gloomy picture in all settings. AIDS has had the effect of reducing the size and experience of the labour force, increasing health care expenditure, raising labour costs and reducing savings and investment.

HIV/AIDS is different from most other diseases because it strikes the most productive age groups and it is essentially 100% fatal. You find that the individual and the family will feel the economic effects first, then the employer or the company the victim is associated with.

For example, when you look at the impact at family level, you find that when a member of the family becomes sick with AIDS, it is usually the women/wives who care for the sick, and young girls may drop out of school to help their mother as a result. The family may exhaust its savings in paying for drugs and funeral expenses. As a result, the family becomes poorer affecting children's education and the living standards of the entire family.

Looking at the impact of AIDS on firms, you find that economic impact on companies is manifested by reduced labour productivity due to absenteeism and loss of skilled work force through AIDS related deaths. Also companies lose a lot of money through medical schemes for the infected employee, funeral expenses and increased employee terminal benefits not to mention the expenses of recruiting and training new staff in an effort to replace the diseased.

As mentioned earlier, HIV/AIDS basically affects all aspects of our lives. You will briefly look at some other consequences of HIV other than its effects on health, education, agriculture and socio-economic sector, but I would advice you to read widely on the topic and add on the list of consequences of the disease.

AIDS Orphans

One of the consequences of AIDS is an increase in the number of orphans. An AIDS orphan is defined as 'a child under 15 years who looses their mother to the AIDS disease.' These orphans may lack proper care and supervision they need at this critical period of their lives. Their care and support also puts strain on family members, the community and the nation as a whole.

Impact on Population Structure, Size and Growth/Impact on Demography

AIDS has, and will continue to have a negative impact on population size. This is because many AIDS patients are dying. Women who are infected are advised to control their productivity in order to avoid mother to child transmission and also to limit the number of orphans. Young adults are dying, leaving children and elderly adults to care for the young.

In summary, AIDS is a devastating illness that affects not only the lives of the infected individuals and their families, but also the economy and social well being of the society as a whole since it:

- Reduces the productivity capacity of large sections of the population before ultimately leading to death
- Increases the demand for support from families and communities, many of

which are already living in impoverished circumstances
- Increases the burden on an already overloaded public health system and reduces it's capacity to deal with non AIDS related illnesses
- Increases the level of resources that must be devoted to dealing with children orphaned by the epidemic
- Decreases productivity to create wealth, and above all AIDS reverses improvements in life expectancy and infant and child mortality, which are key development indicators
- Reduces the life expectancy among the Kenyan population

Poverty, ignorance and ill health and HIV/AIDS are interrelated. The government alone has neither the means nor adequate resources to tackle the problem. So it is the duty of every person to do what it takes, to at least control the spread if not prevent it all together.
To achieve this you need to equip yourself with knowledge, skills and the right attitude to enable you to be agents of change as far as HIV/AIDS prevention and control is concerned.

Prevention of HIV/AIDS

The impact of AIDS will be severe in Kenya, if the HIV infection rate, currently at approximately 7%, is not reduced.
The AIDS disease is not only a serious threat to our socio-economic development as mentioned earlier, but a real danger to our very existence, given the fact that it is 100% fatal.
AIDS has no cure so far. However, a number of interventions can slow down the spread or prevent transmission of HIV infections.

Make a list of the preventive measures you feel should be put in place to fight HIV/AIDS.
These intervention strategies are:

1. Prevention of heterosexual transmission
2. Promotion of abstinence and faithfulness
3. Promoting VCT
4. Promoting use of condom for safer sex
5. Control of STDs
6. Protecting the youth
7. Preventing mother to child transmission
8. Safe blood supply

Prevention of Heterosexual HIVTransmission
Since the main mode of transmission is through heterosexual contact, it is in this area that interventions have to be intensified.
Interventions include promoting abstinence and faithfulness, reduction in the number of sexual partners, encouraging delay in the onset of sexual activity among adolescents and the youth, correct use and consistent availability of condoms, strengthening programmes for STI control and encouraging voluntary counselling and testing.

Promoting Abstinence Before Marriage and Faithfulness to One Partner
One set of interventions focuses on encouraging people to abstain from sex before marriage and to remain faithful to a single partner. Abstinence and faithfulness can be promoted through a combination of mass media, counselling and education programmes.
Delay in the onset of sexual activity among adolescents can have a significant impact on the spread of HIV. Information, education, communication and other programmes that address the needs of adolescents and young people are necessary.
A reduction in HIV incidence among young people would not only avoid much suffering but would also be a critical step in controlling the spread of the virus.
ABC is an acronym that has been used previously to help control the HIV infection.

A Abstinence

B Be faithful to uninfected partner

C Condom use

Promotion of Voluntary Counselling and Testing in Kenya
In voluntary counselling and testing (VCT) for HIV, a person receives counselling needed to make informed choices about whether to undergo confidential testing for HIV. The government of Kenya is fully committed to encourage the provision of VCT services throughout Kenya so that all Kenyans who wish to know their HIV status will have access to these services.
HIV Voluntary Counselling and Testing has been shown to have a role both in preventing HIV infection, and for people with infection, it provides an entry point to care. Counselling

gives people an opportunity to learn and accept their HIV status in a confidential environment with ongoing emotional support and medical care.
Rapid whole blood tests are now available that provide accurate results from a finger prick in just 10 to 15 minutes. People who have tested HIV positive can benefit from early appropriate medical care and interventions to treat or prevent HIV associated illnesses.
Pregnant women who are aware of their HIV positive status can prevent transmission to their infants through the use of antiretroviral therapy. Knowledge of HIV status can also help some people decide how to protect themselves from infection when they are HIV negative and to protect their sexual partners from infection if they are HIV positive. VCT can be a cost effective intervention in preventing HIV transmission.

Promoting the Use and Availability of Condoms

Another important intervention is to promote condom use for safer sex through mass media, counselling, and education programmes and to increase the availability of condoms through expanded public distribution, social marketing programmes and programmes in the workplace.
The consistent and correct use of condoms at every sexual encounter significantly reduces chances of HIV infection. Condoms also prevent other sexually transmitted infections.

Promoting the Control of Other Sexually Transmitted Diseases

Another intervention focuses on controlling the spread of sexually transmitted diseases such as syphilis, gonorrhoea and chancroid.
A study in Mwanza, Tanzania, for example, found a reduction of 42% in the number of new HIV infections after an improved STI prevention and treatment programme. Therefore, it is obvious that services to detect and control STIs can be critically important for managing the HIV/AIDS epidemic.

Promoting Delayed Sexual Activity Among the Adolescent and Youth

The level of HIV infection is alarmingly high among young people, particularly young women. Special efforts are required to protect the youth. It is difficult to change any behaviour pattern, especially a sexual behaviour pattern, once it has become a habit. Around the world, successful prevention programmes among young people are ones that equip adolescents with the knowledge, skills and attitudes that will keep them safe from infection before they become
sexually active.
Alcohol and drug abuse increases HIV transmission risk. This is as a result of impaired judgement that may lead to unprotected sex. Other practices such as intravenous drug use, often associated with the developed world, and drug abuse in general should be discouraged as they increase risk of HIV/AIDS transmission.

Prevention of Mother to Child Transmission (PMCT)

A mother who is infected with HIV has 30 - 40% chance of transmitting the virus to her newborn child in the absence of medical intervention. Various approaches can be used to reduce the number of children infected through vertical transmission.

Preventing HIV Infection in Women

The best way to prevent mother to child transmission of HIV is to prevent the women from becoming infected. Delaying the sexual debut of teenage girls, keeping girls in school, and providing HIV prevention counselling can reduce the number of young pregnant women who are infected. Protecting women from becoming infected during pregnancy and lactation will also reduce the number of infants who are infected.

Comprehensive Antenatal Care and Nutrition During Pregnancy

Preventing and treating malaria and sexually transmitted diseases and correcting nutritional deficiencies promotes the health of mothers and babies and may reduce mother to child transmission
of HIV.

Counselling and Testing

Providing HIV counselling and testing for women and their partners during pregnancy offers an opportunity to prevent HIV infection in HIV negative women and to start antiretroviral therapy for the infected patient to reduce mother to child HIV transmission. Such counselling also enables couples to make informed reproductive choices for the future.

Antiretroviral Therapy

Antiretroviral drugs taken during labour or during

the last week of pregnancy can reduce the viral load in the mother and reduce the risk of mother to child transmission during this time by half. Nevirapine is taken as a single dose early in labour and another dose is given to the newborn at three days of age. AZT (azidovudine) is usually taken in the last week of pregnancy and during labour.

Reducing Transmission During Childbirth
Practices that reduce trauma and shorten exposure to the virus during labour and delivery can reduce HIV transmission. This may include avoiding prolonged rupture of the membranes for more than four hours, avoiding episiotomies, and elective caesarean sections.

Reducing Transmission From Breastfeeding
One third of mother to child transmission occurs through breastfeeding. However many children who are not breastfed die from diarrhoeal diseases and other infections. Therefore health personnel should counsel women about safe and appropriate feeding strategies to minimise mother to child transmission and improve child survival. This includes the choice of replacement feedings, lactation management method and timely weaning.

Reducing the Number of HIV Exposed Pregnancies
Women who are HIV positive may wish to avoid childbearing so that they do not infect their newborn babies or leave behind orphans when they die.

Promoting Safe Blood Supply for Transfusion
A safe blood supply is necessary to avoid infection through blood transfusion. This means that possible donors are first screened through interviews to reject those that have a high probability of being infected with HIV. The donated blood is then screened through laboratory tests to detect any infection.
It follows that because safe blood is often not available, non essential transfusions are always discouraged and autologous transfusions (using the patient's own blood that has been obtained earlier) for planned operations are encouraged.

SECTION 4: HOME BASED CARE FOR PEOPLE LIVING WITH HIV/AIDS

Introduction

At present AIDS has no cure, The disease is spreading so fast that hospitals can't cope with the large numbers of patients wanting admission, which leaves no other alternative but to care for them at home. This section will take you through the important aspect of home care.
So far, you have learned to diagnose, treat and educate people who are infected with almost all STIs that are common in Kenya. However, you have not adequately considered the management of HIV/AIDS, the subject of this section.
Since there is no cure, management of HIV/AIDS may be thought of as care aimed at relieving and containing physical symptoms, conserving and maintaining the body strength and providing emotional, social and spiritual support.
The increasing number of people developing AIDS is alarming and it is creating a heavy burden on formal health sector, which has led to the home based care concept.

Objectives

By the end of this section, you will be able to:

- Describe components of comprehensive home based care
- Describe continuum of care
- Outline the needs of people living with AIDS
- Describe remedies to common opportunistic infections in home based care settings

Home Based Care

Home based care is an approach to care provision that combines clinical services, nursing care, counselling and social support.
It represents a continuum of care, from the health facility, to the community, to the family and to the individual infected with HIV/AIDS. It is a call for partnership among family members, healthcare organisations and the patients themselves in the provision of care. Thus, home based care can be defined as the care given to persons infected and affected by HIV/AIDS that

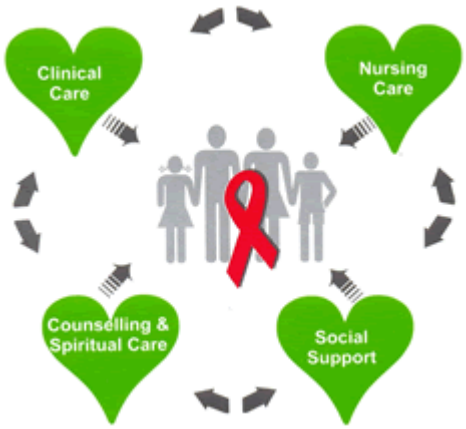
is extended from the health facility to the patient's home, through family participation and community involvement.
Home based care is holistic. It is a product of collaborative efforts by the hospital, family and the community to enhance the quality of life for people infected and affected by HIV/AIDS. It encompasses clinical care, nursing care, counselling, psycho spiritual care and social support and these form the four components of comprehensive home based care.

Components of Comprehensive Home Based Care

The four components of comprehensive home based care are:

- Clinical care
- Nursing care
- Counselling and psycho spiritual care
- Social support

You will now look at each of these components in detail.



Clinical Care
Clinical care is concerned with an early diagnosis, rational treatment and planning for follow up care.
It includes care to promote and maintain good health, hygiene and nutrition.

Nursing Care
Nursing is defined as 'the art of assisting individuals, sick or well, to do those things they would do if they had the strength, knowledge, or will, or to a peaceful death.'
Nursing care for people living with HIV/AIDS is aimed at alleviating physical and psychological symptoms as well as maximising the level of function of the affected person. A systematic assessment of the needs of the sick individual and provision of care to meet those needs is important in achieving the nursing aims. While the PLWHA is still in the hospital, there is recruitment into a home based care programme for patients and relatives. Preparation of a hospital discharge plan should be taken as a priority.
The common presenting problems requiring nursing care are:

- Diarrhoea
- Difficulty in swallowing (dysphagia)
- Difficulty in breathing (dyspnea)
- Swelling of body parts (oedema)
- High temperature (fever)
- Nausea and vomiting
- Nutritional deficiency
- Skin or mucous membrane lesions
- Unkempt mouth and body
- Neurological impairment
- Pain

Nursing also incorporates palliative and terminal care and intends to meet the following patient's needs:

- Symptom control
- Comfort/reassurance
- Nutrition
- Coping with loss and change
- Preparing for death
- Personal and environmental hygiene
- Medication and follow up
- Pain management

Nurses and health care workers should be trained in home based care. Community health workers and family members should also be trained to provide care. Nurses also require equipment and supplies for general nursing procedures as well as time and transport to enable them to access the patient. The family/relatives of the patient should be provided with home care kits containing gloves, cotton wool, disinfectants, and basic medicines.
Nursing care for the terminally ill should focus on helping the patient by:

- Relieving regular pains and aches through either painkillers or massage
- Maintaining personal hygiene through daily bed bath, oral hygiene
- Maintaining nutrition by supervision of feeding a balanced diet
- Preventing pressure sores by changing soiled linen, treatment of pressure areas, and turning the patient regularly,

minimising the risk of skin breakdown such as pressure sores
- Being available for the patient for physical comfort and psychological support

Counselling and Psycho Spiritual Care

This component of the caring process includes reducing stress and anxiety for both the patient and family members, promoting positive living, and helping individuals to make informed decisions on HIV testing, plan for the future and behavioural change, make risk reduction plans, and involve sexual partner(s) in such decisions.

The counselling component is particularly important given the emotional and spiritual upheaval the disease causes. Remember that home based care does not end when a person succumbs to the disease. It must be extended to the survivors, especially the children.

Social Care

Social support includes information and referral to support groups, welfare services, and legal advice for individuals and families, and provision of material assistance where possible.

Home based care can provide the support that will enable the HIV positive person to extend their productive life for many years.

It enables the patient to live positively with the disease because home based care recognises that a diagnosis of HIV does not necessarily mean death is at hand.

This type of care also helps people change attitudes towards persons living with HIV/AIDS and towards the disease itself.

As a result, it reduces the stigma attached to HIV/AIDS victims.

The disease is ultimately fatal and has no cure, therefore you all must continue with prevention efforts. It is observed that when the family and community members provide social support to their family members, neighbours and colleagues, they not only increase access to care but become involved in prevention activities.

Thus home based care enhances prevention of HIV spread.

You have seen that home based care is a teamwork affair, as people with HIV/AIDS have needs of different types which dictate that a variety of care providers must work collaboratively for their patient's welfare. This collaboration is called 'a continuum of care'.

The concept of a continuum of care highlights the need for, and importance of, interrelated and complementary inputs from a variety of sources, all directed towards the welfare of a person who has HIV/AIDS.

Comprehensive Care Across a Continuum From the Health Facility, Community to Home Level

The idea of a continuum of care is that the welfare
of a person with HIV/AIDS is best served by integrated and complementary inputs from a variety
of sources, for example, health workers, family, community, social services, religious groups and so
on. However partnership between the health workers
and the family forms the foundation of the care for
person with HIV/AIDS.

This partnership is based on the following ideas:
- The family and the health professional can
  each contribute something necessary and
  special to the well being of the patient with HIV/AIDS.
- The family is the best source of the holistic care which people with HIV/AIDS require.
- Although people with HIV/AIDS will receive most of their care at home over the entire course of their disease, they also are likely to spend a portion of their time in hospital.
- Home care will decongest health facilities.
- To achieve effective home based care the government has given the objectives, which you must strive to achieve, and the principles are well laid down for all to follow. Make sure you understand them because as a health care provider, you are also a team member in this exercise.

Objectives

Objectives of home based care include:
- To facilitate the continuity of the patient's care from the health facility to the home and community.

- To promote family and community awareness of HIV/AIDS prevention and care.
- To empower people living with HIV/AIDS, including the family, and the community with the knowledge needed to ensure long term care and support.
- To raise the acceptability of the infected by the family/community, hence reducing the stigma associated with AIDS.
- To streamline the patient referral from institutions into the community to appropriate health and social facilities.
- To facilitate quality community care for the infected and affected.
- To mobilise the resources necessary for sustainability of the home based care service.

Principles of Home Based Care

To ensure that the foregoing benefits are realised, home based care should be regarded as a holistic system of care with provisions for:

- Ensuring appropriate, cost effective access to quality health care and support to enable persons living with HIV/AIDS to retain their self sufficiency and maintain quality of life
- Encouraging active participation and involvement of those most affected, the persons living with HIV/AIDS
- Fostering the active participation and involvement of those most able to provide support to the community at all levels
- Targeting social assistance to all affected families, especially children
- Caring for caregivers, in order to minimize the physical and spiritual exhaustion that can come with the prolonged care of the terminally ill
- Ensuring respect for the basic human rights of PLWHAs
- Developing the vital role of home based care as the link between prevention and care
- Taking a multi sector approach to care and support
- Addressing the reproductive health and family planning needs of persons living with HIV/AIDS

 Instituting measures to ensure the economic sustainability of home care support

 Building and supporting referral networks/linkages and collaboration among participating entities

 Building capacity at all levels; household, community and institutional

 Addressing the differential gender impact of the HIV/AIDS epidemic and care for persons living with HIV/AIDS

Needs of PLWHAs

Persons living with HIV/AIDS have physical spiritual, social, and psychological needs that must be met in order to enhance both the quality and the length of their lives.

Physical Needs

Physical needs include the following:

- Drugs for treatment of opportunistic infections and prevention of mother to child transmission
- Clinical care, including medication and regular check ups, to ensure immediate management
- Clothing, housing, food, education of children
- General nursing care, including attention to toilet needs, observation of vital signs, care of wounds, personal and oral hygiene, and comfort
- Nutritional needs, that is, provision of an affordable and locally available balanced diet
- Physical therapy, exercise, massage
- Information, education, and communication. This includes up to date, accurate information on HIV/AIDS and safer sexual behaviour, writing a will, and preparing for the eventuality of death. All these are aimed to helping the patient to live more comfortably and cope with the HIV infection

Spiritual/Pastoral Needs

Strengthening existing faith and helping the PLWHA in spiritual growth boosts the spiritual aspect of life. This plays a great part in encouraging the person to have a positive view of life and to forgive others for any misconceptions and blames. The PLWHA will therefore be able to:

- Accept forgiveness by others
- Forgive others

- Have reassurance that God accepts them
- Allow religious groups to offer support
- Have freedom of worship according to faith, which should be respected by the health worker and the care providers
- Call a religious leader of choice for sacraments and fulfilment of other needs

Social Needs

The patient needs company and association without stigma or discrimination. Therefore the family and community members should facilitate recreation and exercise at clubs/groups of their choice. People living with HIV/AIDS need to be considered as people of value with rights to be respected. They should be encouraged to continue with activities they enjoy, for example, political rallies, church/mosque/temple, and spiritual gatherings.
The social needs of AIDS patients include:

- Respect
- Love and acceptance from others
- Company from those around them
- A source of income
- Right to own, inherit, and bequeath property
- Confidentiality regarding their condition
- Help with the activities of daily living

Psychological Needs

Love, encouragement, warmth, appreciation, reassurance, and help in coping with the infection are some of the patients' psychological needs. Religious groups, volunteer groups, and other support groups can play a part in meeting these needs. When these desires are met, the patient is encouraged to continue with daily activities as long as possible and live positively.

Needs of the Family and Caregivers

Families and caregivers also have physical, psychological, and social/spiritual needs that must be met in order to maintain family

Physical Needs

Family members will need proper STD/HIV/AIDS education and demonstrations on the care they will be expected to provide. The burden of caring for someone who is very ill or dying is constant and heavy. Consequently, the family may also need help with household, farm, or other chores of which the community is better placed to support.

Psychological Needs

The family of a PLWHA needs a lot of support, encouragement, and acceptance from community members so that they may be motivated and encouraged to care for the PLWHA without fear of being isolated. They should be adequately prepared for:

- The deterioration and eventual death of the PLWHA
- How to give unsmothering love and acceptance
- Where and how to meet others who are going through the same experience of caring for similar PLWHAs. This gives the family members a sense of hope and a drive to go on
- The importance of observing confidentiality, for example, keeping matters relating to the PLWHA in confidence
- The very real possibility that they themselves may need to seek counselling to help them cope with the situation

Social and Spiritual/Pastoral Needs

Families don't stop being members of the community when someone gets infected with HIV/AIDS. More than ever, such families need:

- Respect and help with activities of daily living when the need arises
- Acceptance of the PLWHA and help with enabling the PLWHA to socialise and interact in the community
- Solidarity with the PLWHA and the family
- Spiritual comfort, including taking the initiative to involve the PLWHA and family in spiritual growth through worshipping and praying together

Needs of Orphans

Orphans are a very vulnerable group who have numerous needs, some of which include:

- Acceptance by those around them resulting in a sense of belonging
- Basic needs like food, shelter, clothing, education and love
- Legal interventions in cases of property inheritance
- Protection from exploitation

As you can deduce from the objectives and principles of home based care, the affected will benefit from being cared for at home with back up from the health facility because they get adequate attention at home as opposed to already congested hospitals, there is also less chance of getting many opportunistic diseases.

Home based care is less expensive and less demanding in that family members can plan and schedule responsibilities and activities.

When you look at the objectives and the principles, you see that there are basically four essential aspects of home based care, which are:

1. Providing for physical needs (families need to learn how to help a HIV infected person remain in good physical condition, able to resist infections for as long as possible).
2. Providing for medical needs (families need to learn how to prepare and administer required medication, provide appropriate care and when to refer the patient to health facility).
3. Provide for social, emotional and spiritual needs (families need to learn how to provide social, emotional and spiritual support and care).
4. Protecting the infected person and the family against infection (family members need to know how to protect a person with HIV against infectious diseases and how to protect the family against contact with HIV contaminated body fluids, blood and diarrhoea).

You will now explore further the responsibilities of the family of the infected person and a health worker in regards to continuous care.

Family responsibilities include:

- Helping to maintain the patients' physical strength and fitness through nutrition, rest and exercise
- Treating symptoms by administering prescribed medication and referring appropriately to the health facility
- Responding to social emotional and spiritual needs through attention and companionship
- Protecting the infected person against disease and the other members of the family against accidental transmission of HIV

The overall responsibility of a health care provider, meanwhile, is to:

- Educate and guide the family concerning all aspects of home based health worker needs
- Understand that families of persons with HIV/AIDS usually experience as much trauma and shock as the infected persons themselves. Therefore it is the duty of the health care provider to educate the family members
- Feel and show respect, interest and warmth, thereby reducing the family's feelings of stigmatisation and isolation
- Be simple and clear. This will help the family to understand instruction fully despite worries and anxieties, which are likely to distrust their attention
- Remain focused and assist the family to deal with one concern or problem at a time
- Ensure full understanding, by asking the family to repeat instructions or suggestions in their own words, to demonstrate how to give medicine or other types of care

 Encourage dialogue through enquiring about possible constraints to implementing recommended practices in a caring and supportive manner

 Avoid giving advice about problems, instead help the family to talk through their problems and concerns to develop their own plan

 Build the family's confidence and appreciate the family's efforts to handle difficulties and adjust to a new frightening situation

 Invite the family to consult whenever there are problems or the condition of the infected person changes

The health worker also has a responsibility to make sure the patient gets the best care possible by:

- Counselling the infected person about positive living, how to care for them and how to protect others against transmission

- Routinely checking the infected person's condition
- Prescribing all medication and giving careful instructions as to its administration
- Responding to referrals during periods of acute illness or any other requests
- Hospitalising the infected person as necessary
- Assisting the family to establish linkages with other resources in the community

Next you will consider the management of common symptoms of HIV/AIDS. Since the problem of HIV is lowering the body's immune system, the symptoms will be as per the opportunistic infection which sets in. This means that the first thing you should do is to diagnose the condition then treat the infection as you would if it were not associated with HIV.

Common Medications

Even though health workers determine appropriate treatment and care regimen, the actual provision of medication and palliative care is usually done at home. The following is a list of some common opportunistic infections and their medications.

Condition	Medication
Infections	Antibiotics
Fever	Aspirin, paracetamol
Acute diarrhoea	Oral rehydration salts, antibiotics, metronidazole
Persistent diarrhoea	Absorbents, Imodium, tincture of morphine
General skin problems	Calamine lotion, chlorhexidine
Bacterial skin infections	Gentian violet, potassium permanganate, Hydrogen peroxide
Fungal infection (oral and skin problems)	Gentian violet, nystatin, ketoconazole, clotrimazole
Nausea and vomiting	Antiemetics
Pain	Aspirin (or other non-steroidal anti-inflammatory drugs, e.g. paracetamol, narcotic painkillers).
Tuberculosis	Streptomycin, boniazid, ethambutol, Rifampicin, pyrazinamide

Common medications used to treat symptoms of HIV/AIDS caused by different opportunistic infections

Recommended Medicines and Care Regimens

The following links contain the recommended medicines and care regimens for the common opportunistic infections of HIV/AIDS. These recommendations are appropriate for both care at home and in the health facility.

Fever

Give fluids, such as boiled water, weak tea, soup, juices and so on to avoid dehydration. Lower the patient's temperature by tepid sponging. Give antipyretics such as paracetamol.

The patient should be referred to the health facility if the following symptoms are noted:

- The temperature is high for a long time
- Fever is accompanied by cough and weight loss
- There is confusion or personality change
- Severe pain
- Sudden severe diarrhoea
- Convulsions

Diarrhoea

If the patient is suffering from diarrhoea the first step you should take is to give fluids to avoid dehydration. Feed the person with nutritious easily digested foods and ensure that they continue to eat foods that are well cooked and mashed, avoid fats, milk products, (except yoghurt and citric fruits). The patient should also be advised to eat yoghurt, banana and melon. Use oral rehydration salts, antibiotics, and metronidazole for acute diarrhoea, and absorbents, Imodium, tincture of morphine for persistent diarrhoea. Give the person small meals every 2 hours and refer to health facility when a person shows signs of dehydration such as fever, inability to eat or drink, and vomiting, slowly returning skin after pinching and blood in the stool.

Dehydration

Patients suffering from dehydration should be given oral rehydration therapy and if the case is particularly severe should be referred to a health facility.

Skin Problems (rashes, itching, sores, dryness, boils, abscesses)

If a patient exhibits a skin problem, clean the skin often with soap and water. Keep skin dry. Use calamine lotion or herbal remedies for itching and dryness. Use lotion with menthol as palliative therapy for purities. Wash open sores and ulcers with saline water then cover with gauze or clean cloth. For infected sores and ulcers use hot compression over the wound for 20 minutes four times a day. Any dressing should be changed once a day. The patient's position should be changed every two hours to avoid bedsores. Refer the case to a doctor should you detect pus, redness, fever (indicating infection), bad smell, oozing, blisters.

Shingles (Herpes zoster)

Apply calamine lotion twice daily to relieve pain, itching and promote healing. Keep sores dry and clean. Clothing should be clean cotton and loose fitting. Administer aspirin or paracetamol for pain relief. Use saline water to clean the affected area, and apply gentian violet solution or antibiotic cream once a day, or use other treatment as prescribed. If the patient has any open wounds, they should be kept clean, dry and dressed. Watch for infection (redness or pus) and treat if it occurs.
The sap of Frangipani tree (Plumeria Rubra) has been used with success in certain parts of the country in the management of Herpes Zoster.

Mouth and Throat Problems
Emphasise a healthy and soft diet, which does not allow spicy foods. Avoid foods with sugar, yeast or spices. Rinse the mouth with salty water (half a teaspoonful of salt per cup of water) or mouthwash after meals. Encourage regular brushing of teeth. Treat with anti yeast medication such as nystatin, or nizoral. Refer if dehydration sets in due to inability to swallow.

Respiratory Problems
These may include chronic cough, shortnessof breath, chest pain and increased mucous. Keep the person active to promote drainage in the lungs (exercise). Encourage person to cough and consult the physiotherapist. Soothe the throat with tea and honey or cough syrup. Suppress the cough at night with cough suppressants. Refer to a doctor if there is fever, chest pain, grey, yellow or green sputum, and blood in sputum, difficulty in breathing or if the cough has lasted for more than three weeks.

Nausea and Vomiting
Avoid cooking meals and avoid spices. Watch out for dehydration and treat as for diarrhoea with fluids and oral rehydration therapy. Administer antiemetics such as metoclopramide. Refer for further investigation if there is dehydration; severe malnutrition, inability to eat or drink, severe abdominal pain, fever, blood in the vomit or if vomiting lasts more than 24 hours.

Tuberculosis
Keep the home well ventilated. Ensure that the person covers the mouth when coughing to prevent spread. Refer if there is chest pain or chest symptoms, which do not disappear within three weeks.
As AIDS progresses, the patient might develop mental confusion and dementia. Therefore, in the case of home management, there should be somebody with the patient all the times. If the condition worsens, refer the patient to a health facility.

Remember:
Home based care continues even after the disease has progressed beyond what medicine can cure,
that is, the terminal stage and after death, where the person should be given a decent burial, not forgetting the people left, especially children, since they will need lots of support and assistance.

THE END