Essential drugs

Practical guidelines

intended for physicians, pharmacists,
nurses and medical auxiliaries

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Practical guidelines

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Preface

The 1978 Alma Ata Conference on primary health care recognized that essential drugs are vital for preventing and treating illnesses which affect millions of people throughout the world. Essential drugs save lives and improve health.

In 1981, the World Health Organization established the Action Programme on Essential Drugs to support countries to implementing national drug policies and to work towards rational use of drugs. This work was broadened in 1998 when WHO created the department of Essential Drugs and Other Medicines (EDM), combining the responsabilities of the former DAP with WHO's global efforts to promote quality, safety, efficacy, and accurate information for all medicines.

EDM works with countries, international agencies, NGOs like Médecins Sans Frontières, and other organizations to ensure that people everywhere have access to the essential drugs they need at a price which is affordable; that the drugs are safe, effective, and of good quality; and that they are prescribed and used rationally.

Appropriate tools are critical to the effective implementation of essential drugs policies. This practical handbook, based on Médecins Sans Frontières' field experience, is one of the tools which we strongly recommend.

Designed to give practical, concise infomation to physicians, pharmacists and nurses, this "Essential drugs - practical guidelines" is an important contribution from Médecins Sans Frontières to improve the rational use of drugs, which will be a continuing challenge in the coming years.

Dr Jonathan D. Quick
Director,
Essential Drugs and Other medicines
World Health Organization

Foreword

This guide is not a dictionary of pharmacological agents. It is a practical manual intended for health professionals, physicians, pharmacists, nurses and health auxiliaries involved in curative care and drug management.

We have tried to provide simple, practical solutions to the questions and problems faced by medical staff, using the accumulated field experience of Médecins Sans Frontières, the recommendations of reference organizations such as the World Health Organization (WHO) and specialized documentation in each field.

This manual is not only used by Médecins Sans Frontières, but also in a wide range of other programmes and contexts.

The list of drugs in this edition has been revised: in accordance to the most recent WHO list of essential medicines, certain drugs have been added, others have been removed.

Among the entries in this guide, some are not listed in the WHO list of essential medicines. However these drugs are in the same pharmaceutical class for which the WHO has named only one "*example of a therapeutic group*" preceded by a square symbol to indicate that various drugs can be used as alternatives.

Certain medicines, which are not on the WHO list, are still frequently administered although their use is not recommended. These medicines have been included in this guide by entries marked by a grey diagonal line.

The entries are classified according to the route of administration and in alphabetical order. This classification reflects the drug management system proposed in this manual (see *Organization and management of a pharmacy*, page 273).

Only the main contra-indications, adverse effects, precautions and drug interactions of each drug have been indicated in this manual. For further detailed information refer to specialised literature. Concerning antiretrovirals, the interactions are too many to be listed: it is therefore essential to refer to specialised literature.

This manual is a collective effort by medical professionals from many disciplines, all with field experience.

Despite all efforts, it is possible that certain errors may have been overlooked in this manual. Please inform the authors of any errors detected. It is important to remember, that if in doubt, it is the responsibility of the prescribing medical professional to ensure that the doses indicated in this manual conform to the manufacturer's specifications.

The authors would be grateful for any comments or criticisms to ensure that this manual continues to evolve and remains adapted to the reality of the field.

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This manual is also available on the internet at www.msf.org. As treatment protocols are constantly changing, medical staff are encouraged to check this website for updates of this edition.

Use of the guide

General organisation

There are two easy ways to find information in this manual:

– ***A summary*** at the beginning of the manual lists the chapters and their corresponding pages.

– ***A double-entry alphabetical index*** at the end of the manual with international non-proprietary and proprietary names.

Nomenclature of drugs

The International Non-proprietary Names (INN) of drugs is used in this manual. Some frequently used proprietary names, followed by the symbol ®, are also given.

E.g.: amoxicillin (Amoxyl®, Clamoxyl®…)

Dosage

Prescription tables showing average dosage in drug units (tablets, ampoules etc.) according to weight or age of patients are included for the most commonly used drugs.

Dosage for children are expressed in milligrams per kilogram per day (mg/kg/day) for most drugs. For certain symptomatic drugs, dosage is expressed in milligrams per kilogram per dose (mg/kg/dose). For certain antiretrovirals, dosage is expressed in milligrams per square meter (mg/m^2).

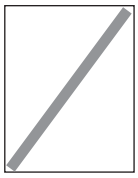
Dosage for adults is expressed in grams or milligrams per day for most drugs. For certain drugs requiring a more precise dosage, doses are expressed in mg/kg/day. In malnourished patients, prescriptions should always be adapted to the patient's weight.

Symbols

Prescription under medical supervision

This box indicates potentially toxic drugs, administered under medical prescription only in many European countries (e.g. Belgium, France, Spain, UK).

This symbol is used to draw attention to drugs whose toxic potential is greater, or for which experience has shown they are frequently misused.



Drugs marked with a grey diagonal line are either potentially dangerous and forbidden in certain countries, or obsolete or ineffective. These drugs are still widely used, attention is therefore drawn to the risk and/or unnecessary cost of their prescription.

Practical recommendations for drug storage:

 drug very sensitive to light

 drug very sensitive to humidity

If no temperature for storage is recommended, this indicates that no information was found in medical literature.

Abbreviations

Units		**Administration route**		**Others**	
kg	= kilogram	IM	= intramuscular	v/v	= volume in volume
g	= gram	IV	= intravenous		
mg	= milligram (1 g = 1000 mg)	SC	= subcutaneous		
µg	= microgram				
m^2	= square meter	**Presentation**			
IU	= international unit				
M	= million	tab	= tablet		
mEq	= milliequivalent	cap	= capsule		
mmol	= millimole	vl	= vial		
ml	= millilitre (1 cc = 1 ml)	amp	= ampoule		
		susp	= suspension		
tsp	= teaspoon (= 5 ml)				
ssp	= soupspoon (= 15 ml)				

Summary

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ABACAVIR = ABC
(Abac®, Abamune®, Ziagen®…)

Prescription under medical supervision

Therapeutic action
– Antiretroviral, HIV-1 and HIV-2 nucleoside reverse transcriptase inhibitor

Indications
– HIV-1 or HIV-2 infection, in combination with other antiretroviral drugs

Presentation
– 300 mg tablet
– 20 mg/ml oral solution, with oral dosing syringe

Dosage
– Child less than 25 kg: 16 mg/kg/day in 2 divided doses, without exceeding 600 mg/day
– Child ≥ 25 kg and adult: 600 mg/day in 2 divided doses

Weight	20 mg/ml oral solution	300 mg tablet
3 to 5 kg	3 ml x 2	–
6 to 9 kg	4 ml x 2	–
10 to 13 kg	6 ml x 2	–
14 to 19 kg	–	1/2 tab x 2
20 to 24 kg	–	1 tab AM and 1/2 tab PM
≥ 25 kg	–	1 tab x 2

Duration: depending on the efficacy and tolerance of abacavir.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe hepatic impairment or history of severe intolerance to abacavir that led to discontinuation of treatment.
– May cause:
  • hypersensitivity reactions: skin rash, gastrointestinal disturbances (nausea, vomiting, diarrhoea, abdominal pain), cough, dyspnoea, malaise, headache, lethargy, oedema, lymphadenopathy, hypotension, myalgia, arthralgia, renal impairment;
  • lactic acidosis and hepatic disorders.

  In all these cases, stop taking abacavir immediately and permanently.
– *Pregnancy: avoid, except if there is no therapeutic alternative*

Remarks
– Tablets are not scored. When half a tablet is required, use a cutter or a tablet cutter to cut the tablet into two equal parts.
– Also comes in fixed-dose combination tablets containing abacavir-lamivudine (Epzicom®, etc.) and abacavir-zidovudine-lamivudine (Trizivir®, etc.).
– *Storage: below 30°C*
  Once opened, oral solution kept below30°C may be stored for a maximum of 2 months.

ACETYLSALICYLIC ACID = ASPIRIN = ASA

Therapeutic action
– Analgesic, antipyretic, non steroidal anti-inflammatory (NSAID)

Indications
– Mild to moderate pain
– Fever
– Rheumatic diseases (except gout)

Presentation
– 100 mg and 500 mg tablets
Also comes in 75 mg and 300 mg tablets.

Dosage
– *Pain, fever*
Child: 60 mg/kg/day in 3 or 4 divided doses
Adult: 1 to 3 g/day in 3 or 4 divided doses

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
100 mg tablet	–	–	1 1/2 tab x 3	3 tab x 3	–	
500 mg tablet	–	–	1/4 tab x 3	1/2 tab x 3	1 tab x 3	

– *Rheumatic diseases*
Child: 50 to 100 mg/kg/day in 4 divided doses
Adult: 3 to 6 g/day in 4 divided doses

– Maximum dose: child: 100 mg/kg/day; adult: 6 g/day

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Do not administer to patients with allergy to aspirin and NSAID, peptic ulcer, coagulation disorders, haemorrhage; severe renal, hepatic or cardiac insufficiency.
– Do not administer to children under one year (use paracetamol).
– Administer with caution to elderly patients or patients with asthma.
– Do not exceed indicated doses, particularly in children and elderly patients. Intoxications are severe, possibly fatal.
– May cause:
  • allergic reactions sometimes severe, epigastric pain, peptic ulcer, haemorrhage,
  • dizziness, tinnitus (early signs of overdose).
  For all cases above, stop aspirin and use paracetamol.
– Do not combine with methotrexate, anticoagulants and NSAID.
– Monitor combination with insulin (increased hypoglycaemia) and corticosteroids.
– *Pregnancy: not recommended during the first 5 months.* ***CONTRA-INDICATED*** *from the beginning of the 6th month (use paracetamol)*
– *Breast-feeding: not recommended (use paracetamol)*

Remarks
– In children under 16 years, preferably use paracetamol.
– Take during meals, preferably with a lot of water.
– For the treatment of moderate pain, it is recommended to combine aspirin with codeine.
– Aspirin may also be administered for its antiplatelet effects in secondary prevention of atherothrombosis, at a dose of 75 to 300 mg daily.
– *Storage: below 25°C –*
Do not use if tablets have a strong smell of vinegar. A slight vinegar smell is always present.

ACICLOVIR
(Viratop®, Zovirax®…)

Prescription under medical supervision

Therapeutic action

– Antiviral active against herpes simplex virus and varicella zoster virus

Indications

– Treatment of recurrent or extensive oral herpes in immunocompromised patients
– Treatment of genital herpes
– Secondary prophylaxis of herpes in patients with frequent and/or severe recurrences
– Treatment of herpetic kerato-uveitis
– Treatment of severe forms of zoster: necrotic or extensive forms, facial zoster, ophthalmic zoster

Presentation

– 200 mg tablet

Also comes in 400 mg and 800 mg tablets and 200 mg/5 ml and 800 mg/10 ml oral suspension.

Dosage and duration

– *Treatment of recurrent or extensive oral herpes in immunocompromised patients*
Child under 2 years: 200 mg 5 times per day for 7 days
Child over 2 years and adult: 400 mg 5 times per day for 7 days

– *Treatment of genital herpes*
Child over 2 years and adult: 400 mg 3 times per day for 7 days; in immunocompromised patients, continue treatment until clinical resolution

– *Secondary prophylaxis of herpes in patients with frequent and/or severe recurrences*
Child under 2 years: 200 mg 2 times per day
Child over 2 years and adult: 400 mg 2 times per day

– *Treatment of herpetic kerato-uveitis*
Child under 2 years: 200 mg 5 times per day for 7 days
Child over 2 years and adult: 400 mg 5 times per day for 7 days

– *Treatment of severe forms of zoster*
Adult: 800 mg 5 times per day for 7 days

Contra-indications, adverse effects, precautions

– Do not administer to patients with hypersensitivity to aciclovir.
– May cause: headache, skin rash, gastrointestinal disturbances, raised transaminases, neurologic disorders in patients with renal impairment.
– May (rarely) cause in immunocompromised patients: thrombocytopenic purpura, haemolytic uraemic syndrome.
– Reduce dosage in patients with renal impairment.
– Drink a lot of liquid during treatment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– For the treatment of herpes simplex, aciclovir should be started within 24-48 hours after the appearance of lesions to reduce severity and duration of infection.
– For the treatment of herpes zoster, aciclovir should be started as soon as possible, preferably within 72 hours after the appearance of lesions. Aciclovir administration does not reduce the likelihood of developing zoster-associated pain but reduces the overall duration of this pain.
– *Storage: below 30°C* – 

ALBENDAZOLE
(Eskazole®, Zentel®…)

Prescription under medical supervision

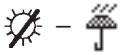
Therapeutic action
– Anthelminthic

Indications
– Ascariasis (*Ascaris lumbricoides*), enterobiasis (*Enterobius vermicularis*), hookworm infections (*Ancylostoma duodenale*, *Necator americanus*)
– Trichuriasis (*Trichuris trichiura*), strongyloidiasis (*Strongyloides stercoralis*)
– Trichinellosis (*Trichinella spp*)

Presentation
– 400 mg tablet

Dosage and duration
– *Ascariasis, enterobiasis, hookworm infections*
  Child over 6 months and adult: 400 mg as a single dose
  Child over 6 months but under 10 kg: 200 mg as a single dose
  In the event of enterobiasis, a second dose may be given after 2 to 4 weeks.
– *Trichuriasis, strongyloidiasis*
  Child over 6 months and adult: 400 mg once daily for 3 days
  Child over 6 months but under 10 kg: 200 mg once daily for 3 days
– *Trichinellosis*
  Child over 2 years: 10 mg/kg/day in 2 divided doses for 10 to 15 days
  Adult: 800 mg/day in 2 divided doses for 10 to 15 days

Contra-indications, adverse effects, precautions
– Do not administer to children less than 6 months.
– Do not administer to patients with ocular cysticercosis.
– May cause:
  • gastrointestinal disturbances, headache, dizziness;
  • neurological disorders (headache, seizures) in patients with undiagnosed neurocysticercosis.
– *Pregnancy: avoid during the first trimester*
– *Breast-feeding: no contra-indication*

Remarks
– Tablets are to be chewed or crushed: follow manufacturer's recommendations.
– In the treatment of strongyloidiasis, ivermectin is more effective than albendazole.
– Albendazole is also used in the treatment of cutaneous larva migrans (*Ancylostoma braziliense* and *caninum*), larval cestode infections (hydatid disease, certain forms of neurocysticercosis) and in mass treatment for lymphatic filariasis (check national recommendations).
– *Storage:*  –

ALUMINIUM HYDROXIDE

Therapeutic action

– Antacid

Indications

– Stomach pain associated with gastritis and peptic ulcer

Presentation

– 500 mg tablet

There are numerous preparations of aluminium and/or magnesium hydroxide and different dosages.

Dosage

– Child over 5 years: rarely indicated. When necessary: half a tablet 3 times/day
– Adult: 3 to 6 tablets/day after meals or 1 tablet during painful attacks

Duration: according to clinical response

Contra-indications, adverse effects, precautions

– May cause: constipation (except when tablets contain magnesium salts or magnesium hydroxide).
– Decreases intestinal absorption of many drugs such as tetracycline, iron salts, isoniazid, ethambutol, chloroquine, atenolol, digoxin, fluoroquinolones, corticosteroids, indometacin, ketoconazole, thyroxine, etc. Do not administer simultaneously with these drugs, administer 2 hours apart.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Chew tablets.
– *Storage:* no special temperature requirements

AMITRIPTYLINE
(Elavil®, Laroxyl®, Triptyzol®…)

Prescription under medical supervision

Therapeutic action
– Sedating tricyclic antidepressant

Indications
– Depression in adults, especially when a sedative effect is required (anxiety, agitation, insomnia)
– Neuropathic pain in adults

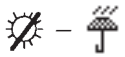
Presentation
– 10 mg, 25 mg and 50 mg tablets

Dosage
– *Depression*
Initial dose of 75 mg/day in 2 to 3 divided doses, or once daily at night, gradually increased, if necessary, to a maximum dose of 150 mg/day
– *Neuropathic pain*
Initial dose of 25 mg/day at night for one week, followed by 50 mg/day at night for one week then 75 mg/day at night
– Reduce the dose by one-half in elderly patients.

Duration
– *Depression:* minimum 3 months. The treatment should be withdrawn gradually ; if signs of relapse occur, increase the dose.
– *Neuropathic pain:* continue several months after pain relief is obtained, then attempt to stop treatment.

Contra-indications, adverse effects, precautions
– Do not administer if: recent myocardial infarction, arrhythmia, impaired liver function, acute mania. Do not administer to children.
– May cause:
  • antimuscarinic effects: dry mouth, urinary retention, disturbance of accommodation, constipation, tachycardia
  • orthostatic hypotension, arrhythmia, cutaneous reactions, endocrine disorders, weight gain, sweating
  • frequent drowsiness, tremor, insomnia, transient mental confusion
  • effects linked to depressive illness: may exacerbate suicidal tendencies and psychotic symptoms

  Adverse effects occur particularly in the elderly and in the event of overdosage.
– Do not combine with another antidepressant, especially an MAOI.
– Avoid combination with atropine, epinephrine (adrenaline), methyldopa (increased hypotension).
– Use with caution when driving or operating machinery: risk of drowsiness.
– Do not drink alcohol during treatment.
– Administer with caution, under medical supervision, in epilepsy, cardiovascular disease, hepatic or renal failure, prostatic hyperplasia, thyroid disease.
– Closely monitor patients with suicidal tendencies, especially in the initial stage of treatment.
– *Pregnancy: avoid, especially at the end of pregnancy (antimuscarinic effects in neonates)*
– *Breast-feeding: avoid*

Remarks
– In the treatment of neuropathic pain, amitriptyline is often combined with carbamazepine (except in pregnant women).
– Sedative action occurs following initial doses. Antidepressant and analgesic effects are delayed for 10 to 20 days. Wait for several weeks before assessment of efficacy. This must be explained to the patient to encourage compliance.
– Combination with an anxiolytic or a neuroleptic may be useful in anxious or agitated patients.
– *Storage:*  –

AMODIAQUINE = AQ
(Camoquin®, Flavoquine®…)

Prescription under medical supervision

Therapeutic action
– Antimalarial

Indications
– Treatment of uncomplicated falciparum malaria, in combination with artesunate

Presentation
The dose written on the labels is sometimes in amodiaquine salt and sometimes in amodiaquine base which leads to frequent confusion:
– 200 mg amodiaquine hydrochloride tablet, containing 153 mg amodiaquine base
– 260 mg amodiaquine hydrochloride tablet, containing 200 mg amodiaquine base

Dosage and duration
– Child over 2 months and adult: 10 mg base/kg once daily for 3 days

Age/weight	**< 1 year < 10 kg**	**1 to 6 years 10 to 20 kg**	**7 to 13 years 21 to 40 kg**	**14 years and over > 40 kg**
153 mg base tablet	1/2 tab	1 tab	2 tab	4 tab
200 mg base tablet	1/4 tab	3/4 tab	1 1/2 tab	3 tab

Contra-indications, adverse effects, precautions
– Do not administer to patients with hypersensitivity to amodiaquine, hepatic impairment, retinopathy.
– May cause: gastrointestinal and visual disturbances, pruritus.
– *Pregnancy: do not administer during the first trimester, except if there is no therapeutic alternative*
– *Breast-feeding: avoid, except if there is no therapeutic alternative*

Remarks
– Take tablets after a meal.
– The combination artesunate-amodiaquine exists in co-blisters (Arsucam®, Falcimon®, Larimal®, etc.). The two active ingredients are not combined in the same tablet but are presented in the same blister to facilitate compliance. There are three presentations: adult, child and infant.
– There is also a fixed dose combination tablets incorporating artesunate-amodiaquine (Coarsucam®): 100 mg artesunate + 270 mg amodiaquine tablets (2 tab/day for 3 days for adults; 1 tab/day for 3 days for adolescents) and 25 mg artesunate + 67.5 mg amodiaquine paediatric tablets (1 or 2 tab/day for 3 days according to age).
– Amodiaquine should not be used for prophylaxis.
– *Storage: below 25°C* –  – 

AMOXICILLIN
(Amoxil®, Clamoxyl®…)

Prescription under medical supervision

Therapeutic action
– Penicillin antibacterial

Indications
– Respiratory and ENT infections (pneumonia, sinusitis, otitis media, streptococcal tonsillitis), stomatologic infections, urinary infections (cystitis), gastrointestinal and biliary infections, infection due to *Helicobacter pylor*i (in combination with omeprazole and metronidazole or tinidazole), leptospirosis, etc.
– Parenteral to oral switch therapy

Presentation
– 250 mg and 500 mg tablets or capsules
– Powder for oral suspension, 125 mg/5 ml

Dosage
– Child: 50 mg/kg/day in 2 to 3 divided dose
– Adult: 1.5 g/day in 3 divided doses or 2 g/day in 2 divided doses

Age	Weight	250 mg tablet	500 mg tablet	Oral suspension 125 mg/5 ml
< 2 months	< 4 kg	1/2 tab x 2	–	1 tsp x 2
2 months to 1 year	4 to 8 kg	1/2 to 1 tab x 2	–	1 to 2 tsp x 2
1 to 5 years	8 to 15 kg	1 1/2 tab x 2	1/2 tab x 2	3 tsp x 2
5 to 10 years	15 to 25 kg	2 tab x 2	1 tab x 2	4 tsp x 2
10 to 15 years	25 to 35 kg	3 tab x 2	1 1/2 tab x 2	–
Adult	> 35 kg	4 tab x 2	2 tab x 2	–

– In severe infections, double the dose.

Duration
– *Otitis media and cystitis*: 5 days; *tonsillitis*: 6 days; *leptospirosis*: 7 days; *pneumonia and sinusitis*: 7 to 10 days; *H. pylori infection*: 10 to 14 days; *typhoid fever*: 14 days

Contra-indications, adverse effects, precautions
– Do not administer to penicillin-allergic patients, patients with infectious mononucleosis.
– Administer with caution to patients allergic to cephalosporins (cross-sensitivity may occur).
– May cause: gastrointestinal disturbances, allergic reactions, sometimes severe. In the event of allergic reaction, stop treatment immediately.
– Reduce dosage in patients with severe renal impairment.
– Do not combine with methotrexate.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Use amoxicillin rather than ampicillin: as it is absorbed better, only half the dose is required.
– *Storage: below 25°C*
Once reconstituted, the oral suspension keeps for 7 days maximum, below 25°C.

ARTEMETHER + LUMEFANTRINE = COARTEMETHER
(Coartem®, Riamet®…)

Prescription under medical supervision

Therapeutic action
– Antimalarial

Indications
– Treatment of uncomplicated falciparum malaria

Presentation
– 20 mg artemether + 120 mg lumefantrine tablet

Dosage and duration

Weight	20 mg + 120 mg tablet
< 5 kg	Do not administer
5 to 14 kg	2 tablets/day in 2 divided doses for 3 days
15 to 24 kg	4 tablets/day in 2 divided doses for 3 days
25 to 34 kg	6 tablets/day in 2 divided doses for 3 days
≥ 35 kg	8 tablets/day in 2 divided doses for 3 days

Contra-indications, adverse effects, precautions
– Do not administer to patients with cardiac disease, family history of QT interval prolongation or sudden death, personal history of congenital or acquired QT interval prolongation.
– Do not combine with: azole antifungals (fluconazole, itraconazole, ketoconazole, miconazole, etc.), tricyclic antidepressants, neuroleptics (chlorpromazine, haloperidol, etc.), macrolides, quinolones, other antimalarials, beta-blockers, protease inhibitors.
– May cause: sleep disorders, headache, dizziness, gastrointestinal disturbances, cough, palpitations, rash, pruritus, arthralgia, myalgia.
– If the patient vomits within one hour after administration: repeat the full dose.
– *Pregnancy: CONTRA-INDICATED during the first trimester, avoid during the 2nd and 3rd trimesters, except if there is no therapeutic alternative*
– *Breast-feeding: not recommended*

Remarks
– Take with meals.
– Coartemether should not be used for prophylaxis.
– Lumefantrine is also called benflumetol.
– *Storage: below 30°C* –  – 

ARTESUNATE = AS
(Arsumax®, Plasmotrim®…)

Prescription under medical supervision

Therapeutic action
– Antimalarial

Indications
– Treatment of uncomplicated falciparum malaria, in combination with another antimalarial

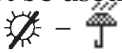
Presentation
– 50 mg tablet
Also comes in 100 mg and 200 mg tablets.

Dosage and duration
– Child and adult: 4 mg/kg once daily for 3 days

Age/weight	**< 1 year < 10 kg**	**1 to 6 years 10 to 20 kg**	**7 to 13 years 21 to 40 kg**	**14 years and over > 40 kg**
50 mg tablet	1/2 tab	1 tab	2 tab	4 tab
100 mg tablet	–	1/2 tab	1 tab	2 tab
200 mg tablet	–	–	1/2 tab	1 tab

– Artesunate must always be combined with another antimalarial: amodiaquine, sulfadoxine-pyrimethamine or mefloquine. The choice of the second antimalarial depends on the known resistance level in the area concerned.

Contra-indications, adverse effects, precautions
– Do not administer to patients with hypersensitivity to artemisinin derivatives.
– May cause: gastrointestinal disturbances, headache, dizziness, pruritus.
– *Pregnancy: avoid during the first trimester*
– *Breast-feeding: no contra-indication*

Remarks
– The combinations artesunate-amodiaquine (Arsucam®, Falcimon®, Larimal®, etc.), artesunate-sulfadoxine/pyrimethamine (Arsudar®), artesunate-mefloquine (Artequin®) exist in co-blisters. The active ingredients are not combined in the same tablet but are presented in the same blister to facilitate compliance.
– Also comes in fixed dose combinations artesunate-amodiaquine (Coarsucam® 100 mg artesunate + 270 mg amodiaquine tablets and 25 mg artesunate + 67.5 mg amodiaquine paediatric tablets) and artesunate-mefloquine (100 mg artesunate + 200 mg mefloquine tablets and 25 mg artesunate + 50 mg mefloquine tablets).
– For the treatment of severe falciparum malaria, use either injectable route (artemether or artesunate) or rectal route (50 mg or 200 mg artesunate rectocaps).
– Artesunate should not be used for prophylaxis.
– *Storage: below 25°C* –  –

ASCORBIC ACID = VITAMIN C
(Laroscorbine®, Redoxon®, Vitascorbol®…)

Therapeutic action

– Vitamin

Indications

– Treatment and prevention of scurvy (vitamin C deficiency)

Presentation

– 50 mg tablet

Also comes in 250 mg, 500 mg and 1 g tablets.

Dosage and duration

– *Treatment:*
  Child: 150 to 200 mg/day in 3 or 4 divided doses
  Adult: 500 to 750 mg/day in 3 or 4 divided doses
  The treatment is continued until symptoms improve (1 to 2 weeks), then a preventive treatment is given as long as the situation requires.

– *Prevention:*
  Child and adult: 25 to 50 mg/day, as long as the situation requires

Contra-indications, adverse effects, precautions

– Ascorbic acid is well tolerated at indicated doses.
– May cause: gastrointestinal disturbances and nephrolithiasis for doses > 1 g/day; may interfere with the measurement of glucose in blood and urine for doses ≥ 2 g/day.
– *Pregnancy: no contra-indication, do not exceed 1 g/day*
– *Breast-feeding: no contra-indication*

Remarks

– *Storage: below 30°C* –  – 

ATENOLOL
(Tenormin®…)

Prescription under medical supervision

Therapeutic action
– Cardioselective beta-blocker

Indications
– Hypertension (including hypertension in pregnancy)
– Prophylaxis of angina pectoris
– Arrhythmia

Presentation
– 50 mg and 100 mg tablets

Dosage
– *Hypertension*
  Adult: 50 to 100 mg once daily, preferably in the morning
– *Prophylaxis of angina pectoris*
  Adult: 100 mg once daily
– *Arrhythmia*
  Adult: 50 to 100 mg once daily

Duration
– According to clinical response. Do not stop treatment abruptly, decrease doses gradually.

Contra-indications, adverse effects, precautions
– Do not administer to patients with asthma, chronic obstructive bronchopneumonia, bradycardia < 50/minute, atrio-ventricular heart blocks, Raynaud's syndrome, severe hypotension, severe depression.
– May cause: bradycardia, hypotension, heart failure, asthma attack, gastrointestinal disturbances, hypoglycaemia, dizziness.
– In the event of anaphylactic shock: risk of resistance to epinephrine.
– Reduce dosage in patients with renal impairment.
– Administer with caution to patients with diabetes (induces hypoglycaemia, masks the symptoms of hypoglycaemia) or to patients treated with digitalis glycosides (risk of bradycardia).
– Do not administer simultaneously with antacids such as aluminium hydroxide, etc. (decreased intestinal absorption), administer 2 hours apart.
– Monitor combination with epinephrine (hypertension); tricyclic antidepressants, other anti-hypertensive drugs, nitrates, acetazolamide, ketamine (hypotension); mefloquine, digoxin, amiodarone, verapamil, diltiazem (bradycardia).
– *Pregnancy: no contra-indication. After delivery monitor the newborn for at least 72 hours (risk of hypoglycaemia, bradycardia, respiratory distress).*
– *Breast-feeding: avoid*

Remarks
– Atenolol is also used for the secondary prophylaxis of myocardial infarction (50 mg once daily).
– *Storage: below 25°C* –

AZITHROMYCIN
(Zithromax®…)

Prescription under medical supervision

Therapeutic action

– Macrolide antibacterial

Indications

– Trachoma
– Genital infections due to *Chlamydia trachomatis* (urethritis, cervicitis,)
– Donovanosis (granuloma inguinale), chancroid
– Streptococcal tonsillitis in penicillin-allergic patients

Presentation

– 250 mg and 500 mg capsules or tablets
– 200 mg/5 ml paediatric oral suspension

Dosage and duration

– *Trachoma, genital infections due to C. trachomatis, chancroid*
  Child: 20 mg/kg as a single dose
  Adult: 1 g as a single dose
– *Donovanosis (granuloma inguinale)*
  Adult: 1 g on first day then 500 mg/day until healing of lesions (at least 14 days)
– *Streptococcal tonsillitis in penicillin-allergic patients*
  Child: 20 mg/kg once daily for 3 days, without exceeding 500 mg/day
  Adult: 500 mg once daily for 3 days

Contra-indications, adverse effects, precautions

– Do not administer in patients with allergy to azithromycin or another macrolide.
– May cause: gastrointestinal disorders, allergic reactions.
– Do not administer simultaneously with antacids (aluminium hydroxide, etc.). Administer 2 hours apart.
– Avoid combination with co-artemether.
– Administer with caution and reduce doses in patients with severe hepatic impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Patients infected with *C. trachomatis* are often coinfected with *N. gonorrhoeae*. Therefore, all patients with chlamydia should receive an effective treatment for gonorrhoea.
– For the treatment of tonsillitis, the use of azithromycin should be restricted to penicillin-allergic patients as:
  • there are streptococci resistant to macrolides,
  • its efficacy in the prevention of rheumatic fever has not been studied.
– *Storage: below 30°C* – 

BECLOMETASONE aerosol
(Beclazone®, Becotide®…)

Prescription under medical supervision

Therapeutic action
– Anti-inflammatory drug (corticosteroid)

Indications
– Long term treatment of persistent asthma

Presentation
– Pressurized inhalation solution of beclomatesone dipropionate, 50 micrograms and 250 micrograms /inhalation

Also comes in aerosol inhaler delivering 100 micrograms and 200 micrograms/inhalation.

Dosage and administration
The dosage varies from one person to another. The initial dose depends on the severity of symptoms. It may be increased or reduced over time. Always try to administer the lowest effective dose. For information:

– *Mild to moderate persistent asthma*
  Child: 100 to 400 micrograms/day in 2 or 4 divided doses
  Adult: 500 to 1000 micrograms/day in 2 or 4 divided doses
– *Severe persistent asthma*
  Child: up to 800 micrograms/day in 2 or 4 divided doses
  Adult: up to 1500 micrograms/day in 2 or 4 divided doses

Shake the inhaler. Breathe out as completely as possible. Place the lips tightly around the mouthpiece. Inhale deeply while activating the inhaler. Hold breath 10 seconds before exhaling. Verify that the inhalation technique is correct.
Co-ordination between the hand and inhalation is very difficult in certain patients (children under 6 years, elderly patients, etc.). Use a spacer to facilitate administration and improve the efficacy of treatment.

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Do not administer to patients with untreated active tuberculosis.
– May cause: throat irritation, hoarseness at the beginning of treatment, oro-pharyngeal candidiasis.
– In the event of cough and/or bronchospasm following inhalation of beclometasone: administer salbutamol if necessary, stop inhalation of beclometasone and replace with an oral corticoid.
– In the event of bronchial infection, administer appropriate antibiotic treatment in order to optimise the diffusion of beclometasone in the respiratory tract.
– If the maximum dosage becomes insufficient, re-evaluate the severity of asthma and combine with a short oral anti-inflammatory treatment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Beclometasone is not a bronchodilator. For asthma attack, use inhaled salbutamol.
– Aerosol inhalers delivering 200 and 250 micrograms/inhalation are not suitable for children. They should only be used in adults. Only inhalers delivering 50 and 100 micrograms/inhalation can be used in children.
– Relief of symptoms may require several days or weeks of continuous therapy.
– Clean the mouthpiece before and after each use.
– Do not pierce or incinerate used aerosol containers. Empty all residual gas, then bury.
– *Storage: below 25°C* –

BISACODYL
(Dulco-lax®…)

Therapeutic action
- Stimulant laxative

Indications
- Prevention of constipation in patients taking opioid analgesics (codeine, morphine, etc.)
- Short-term, symptomatic treatment of constipation

Presentation
- 5 mg enteric-coated tablet

Dosage
- Child over 3 years: 5 to 10 mg once daily
- Adult: 10 to 15 mg once daily

Duration
- *Prevention of constipation in patients taking opioids*: start bisacodyl when analgesic treatment continues more than 48 hours. Tablets must be taken daily, at night (bisacodyl is effective 6 to 12 hours after administration), until the end of the opioid treatment. Regular follow up (frequency/consistency of stools) is essential in order to adjust dosage correctly.
- *Treatment of constipation*: until the patient passes stools, maximum 7 days.

Contra-indications, adverse effects, precautions
- Do not administer to patients with Crohn's disease, ulcerative colitis, intestinal obstruction, undiagnosed abdominal pain and dehydration.
- May cause: diarrhoea, abdominal cramps, hypokalaemia.
- In the event of diarrhoea: exclude a faecal impaction or intestinal obstruction, stop treatment for 24 hours and then start again with a half dose.
- In the event of abdominal cramps: reduce or divide the daily dose. Stop treatment if pain continues.
- Do not combine with drugs that induce *torsades de pointe* (halofantrine, erythromycin IV, pentamidine, etc.).
- Closely monitor patients taking drugs that induce hypokalaemia (furosemide, amphotericin B, corticosteroids, etc.) or cardiac glycosides.
- *Pregnancy and breast-feeding: avoid; for routine prevention of constipation due to opioids, use lactulose.*

Remarks
- To prevent constipation in patients taking opioids, use lactulose if the patient's stools are solid; use bisacodyl if the patient's stools are soft.
- In children from 6 months to 3 years, do not use the oral route. Use only 5 mg paediatric suppositories (one suppository/day).
- Swallow tablets whole; do not crush or chew.
- Bisacodyl is equivalent to senna, the representative example of laxative stimulants in the WHO list of essential medicines.
- The treatment must be accompanied by dietary measures (plenty of fluids and fibre).
- *Storage: below 30°C*

CABERGOLINE
(Dostinex®…)

Prescription under medical supervision

Therapeutic action
– Lactation inhibitor

Indications
– Inhibition of physiological lactation
– Suppression of established lactation

Presentation
– 0.5 mg tablet

Dosage and duration
– Lactation inhibition: 1 mg as a single dose on the first day post-partum
– Lactation suppression: 0.25 mg every 12 hours for 2 days

Contra-indications, adverse effects, precautions
– Do not administer to patients with hypersensitivity to cabergoline, post-partum hypertension.
– May cause: nausea, vomiting, headache, dizziness, hypotension, drowsiness.
– Stop treatment in the event of dyspnoea, persistent cough, chest pain, abdominal pain.
– Do not combine with: neuroleptics (chlorpromazine, haloperidol, etc.), metoclopramide, promethazine and methylergometrine.
– *Pregnancy*: ***CONTRA-INDICATED***

Remarks
– Cabergoline is a dopamine agonist also used in the treatment of Parkinson's disease.
– Cabergoline is not included in the WHO list of essential medicines.
– *Storage: below 30°C* –

CALCIUM FOLINATE = FOLINIC ACID (Refolinon®…)

Prescription under medical supervision

Therapeutic action

– Antidote to folate antagonists

Indications

– Prevention of haemotological toxicity of pyrimethamine when pyrimethamine is used as prophylaxis for, or in the treatment of toxoplasmosis or isosporiasis in immunodeficient patients

Presentation

– 15 mg tablet

Also comes in 5 mg and 25 mg capsules.

Dosage

– *When pyrimethamine is used as primary or secondary prophylaxis for toxoplasmosis*
  Adult: 25 to 30 mg once weekly
– *During treatment of toxoplasmosis*
  Adult: 10 to 25 mg once daily
– *During treatment of isosporiasis*
  Adult: 5 to 15 mg once daily

Duration

– For the duration of the pyrimethamine treatment

Contra-indications, adverse effects, precautions

– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Folic acid cannot be used as an alternative to folinic acid for the treatment of toxoplasmosis: folic acid reduces the antiprotozoal activity of pyrimethamine.
– Calcium folinate is also called calcium leucovorin.
– *Storage: below 30°C* –

CARBAMAZEPINE
(Tegretal®, Tegretol®…)

Prescription under medical supervision

Therapeutic action
– Antiepileptic

Indications
– Epilepsy (except absence seizures)
– Neuropathic pain (alone or combined with amitriptyline)

Presentation
– 100 mg and 200 mg tablets

Also comes in 100 mg/5 ml oral solution.

Dosage
– *Epilepsy*
  Child: initially 5 mg/kg once daily or in 2 divided doses, then increase every 2 weeks up to 10 to 20 mg/kg/day in 2 to 4 divided doses
  Adult: initially 100 to 200 mg once daily or in 2 divided doses, then increase by 100 to 200 mg increments every 2 weeks up to 800 to 1200 mg/day in 2 to 4 divided doses
– *Neuropathic pain*
  Adult: initially 200 mg once daily at night for one week, then 400 mg/day in 2 divided doses (morning and night) for one week, then 600 mg/day in 3 divided doses

Duration
– *Epilepsy*: lifetime treatment. Do not stop treatment abruptly, even if changing treatment to another antiepileptic.
– *Neuropathic pain*: continue several months after pain relief is obtained, then attempt to stop treatment.

Contra-indications, adverse effects, precautions
– Do not administer to patients with atrioventricular block, history of bone marrow depression.
– Administer with caution to patients with glaucoma, urinary retention, hepatic or renal impairment, heart failure or blood disorders and to elderly patients.
– May cause:
  • headache, dizziness, gastrointestinal and visual disturbances, rash, leucopenia, confusion and agitation in elderly patients, drowsiness (use with caution when driving or operating machinery),
  • exceptionally: Lyell's and Stevens-Johnson syndromes, agranulocytosis, anaemia, bone marrow depression, pancreatitis, hepatitis, cardiac conduction defect. If so, stop treatment.
– Do not drink alcohol during treatment.
– Do not combine with: erythromycin, isoniazid, valproic acid (increased carbamazepine plasma concentrations), oestroprogestogens (reduced contraceptive efficacy), saquinavir (reduced efficacy of saquinavir).
– Monitor combination with: oral anticoagulants, corticosteroids, antidepressants, haloperidol, protease inhibitors, aminophylline, rifampicine, itraconazole, etc.
– *Pregnancy:*
  • *Epilepsy: do not start treatment during the first trimester, except if vital and there is no alternative (risk of neural tube defect). However, if treatment has been started before a pregnancy, do not stop treatment. The administration of folic acid before conception and during the first trimester seems to reduce the risk of neural tube defect.*
    Due to the risk of haemorrhagic disease of the newborn, administer vitamin K to the mother and the newborn infant.
  • *Neuropathic pain: not recommended*
– *Breast-feeding: no contra-indication*

Remarks
– *Storage:* 

CEFIXIME
(Suprax®…)

Prescription under medical supervision

Therapeutic action
– Third-generation cephalosporin antibacterial

Indications
– Uncomplicated gonorrhoea
– Acute cystitis, when quinolones are contra-indicated
– Acute pyelonephritis, after initial therapy with injectable ceftriaxone
– Typhoid fever in children

Presentation
– 200 mg tablet or capsule

Also comes in 40 mg/5 ml and 100 mg/5 ml powder for oral suspension.

Dosage
– *Uncomplicated gonorrhoea*
  Adult: 400 mg
– *Urinary tract infections*
  Child over 6 months: 8 mg/kg/day in 2 divided doses
  Adult: 400 mg/day in 2 divided doses
– *Typhoid fever*
  Child over 6 months: 15 to 20 mg/kg/day in 2 divided doses

Duration
– *Gonorrhoea*: single dose
– *Cystitis*: 5 days
– *Pyelonephritis*: 10 to 14 days depending on severity
– *Typhoid fever*: 7 to 14 days depending on severity

Contra-indications, adverse effects, precautions
– Do not administer to patients with allergy to cephalosporins.
– Administer with caution to penicillin-allergic patients (cross-sensitivity may occur).
– May cause: gastrointestinal disturbances; rarely: headache, dizziness, allergic reactions (rash, pruritus, fever).
– In the event of allergic reactions, stop treatment immediately.
– Reduce dosage in patients with severe renal impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Patients infected with *N. gonorrhoeae* are often coinfected with *C. trachomatis*. Therefore, all patients with gonorrhoea should receive an effective treatment for chlamydia.
– *Storage: below 25°C*
  Once reconstituted, the oral suspension keeps for 10 days maximum.

CHLORAMPHENICOL
(Chloromycetin®, Kemicetine®…)

Prescription under medical supervision

Therapeutic action
– Antibacterial

Indications
– Typhoid fever, plague, rickettsial infections
– Parenteral to oral switch therapy (meningitis, severe pneumonia, etc.)

Presentation
– 250 mg capsule
– Powder for oral suspension, 125 mg/5 ml

Dosage
– Child from 2 months to 1 year: 50 mg/kg/day in 3 to 4 divided doses
– Child over 1 year: 50 mg/kg/day in 3 to 4 divided doses; 100 mg/kg/day in severe infection
– Adult: 3 to 4 g/day in 3 to 4 divided doses

Age	Weight	150 mg/5 ml oral suspension	250 mg capsule
< 2 weeks	–	1 ml x 3	–
< 1 year	< 8 kg	2 to 4 ml x 3	–
1 to 5 years	8 to 15 kg	5 to 8 ml x 3	–
5 to 10 years	15 to 25 kg	–	1 to 2 caps x 3
10 to 15 years	25 to 35 kg	–	2 to 4 caps x 3
Adult	> 35 kg	–	4 caps x 3

Duration
– *Typhoid fever*: 10 to 14 days; *plague*: 10 days; *rickettsiosis*: continue for 48 hours after the resolution of fever; *pneumonia*: 5 to 10 days

Contra-indications, adverse effects, precautions
– Do not administer to premature infants; avoid in newborns and children under 2 months of age (if there is no alternative, dosage is 25 mg/kg/day in 3 divided doses).
– Do not administer to patients with a history of previous allergic and/or toxic reaction to chloramphenicol, G6PD deficiency.
– Reduce dosage in patients with hepatic or renal impairment.
– May cause:
  • gastrointestinal disorders,
  • allergic reactions, dose-related and reversible marrow depression (anaemia, leucopenia, thrombocytopenia): if so, stop treatment,
  • grey syndrome in premature infants and neonates (vomiting, hypothermia, blue-grey skin colour and cardiovascular depression), irreversible aplastic anaemia.
– *Pregnancy*: **CONTRA-INDICATED**, *except if vital, if there is no therapeutic alternative. If used during the 3rd trimester, risk of grey syndrome in the newborn infant.*
– *Breast-feeding*: **CONTRA-INDICATED**

Remarks
– Due to its potential haematotoxicity, the use of chloramphenicol should be restricted to severe infections when other less toxic antibiotics are not effective or are contra-indicated.
– Oral treatment is more effective than parenteral treatment: blood and tissue concentrations are higher when chloramphenicol is given orally.
– *Storage: below 30°C* –

CHLOROQUINE sulfate or phosphate (Nivaquine®…)

Given that resistance of *P. falciparum* to chloroquine is widespread, this drug must not be used for the treatment of falciparum malaria in Africa, South America, Asia and Oceania.

Therapeutic action

– Antimalarial

Indications

– Treatment of malaria due to *P. vivax*, *P. ovale* and *P. malariae*
– Treatment of uncomplicated falciparum malaria, only in areas where *P. falciparum* is still sensitive to chloroquine (Central America, Haiti and Dominican Republic)
– Prophylaxis of falciparum malaria for non-immune individuals, only in areas where resistance to chloroquine is moderate and always in combination with proguanil

Presentation

– 100 mg and 150 mg chloroquine base tablets
– 50 mg chloroquine base/5 ml syrup

The dose written on the labels is sometimes in chloroquine salt and sometimes in chloroquine base which leads to frequent confusion. The WHO recommends prescriptions and labels in chloroquine base.

100 mg base = approx. 130 mg sulfate = approx. 160 mg phosphate or diphosphate
150 mg base = approx. 200 mg sulfate = approx. 250 mg phosphate or diphosphate

Dosage and duration

– *Treatment of malaria*
Child and adult:
Day 1 and Day 2: 10 mg base/kg once daily
Day 3 : 5 mg base/kg

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
100 mg base tablet						
Day 1 and Day 2		1/2 tab	1 tab	21/2 tab		6 tab
Day 3		1/4 tab	1/2 tab	1 tab		3 tab
150 mg base tablet						
Day 1 and Day 2		1/4 tab	1/2 tab	11/2 tab		4 tab
Day 3		1/8 tab	1/4 tab	3/4 tab		2 tab

– *Prophylaxis of falciparum malaria in areas where resistance to chloroquine is moderate*
Child: 1.7 mg chloroquine base/kg once daily (always combined with proguanil)
Adult: 100 mg chloroquine base once daily (always combined with proguanil)
Travellers should start prophylaxis 24 hours before departure, continue throughout the stay and for at least 4 weeks after return.

In areas where resistance to chloroquine is high, chloroquine must be replaced by another effective antimalarial suitable for prophylactic use.

Contra-indications, adverse effects, precautions

- Do not administer to patients with retinopathy.
- May cause: gastrointestinal disturbances, headache, transitory pruritus (lasting 72 hours), allergic reactions (urticaria, angioedema), visual disturbances.
- If the patient vomits within one hour after administration:
  - during the first 30 minutes : repeat the full dose
  - after 30 minutes : give half the dose
- There is a narrow margin between the therapeutic and toxic dose. Doses of 20 mg base/kg in children and 2 g base in adults are considered toxic.
- Do not combine with: coartemether, quinine, mefloquine, halofantrine.
- Do not administer simultaneously with antacids (aluminium hydroxide, etc.): administer 2 hours apart.
- *Pregnancy: no contra-indication*
- *Breast-feeding: no contra-indication*

Remarks

- Chloroquine alone (without proguanil) is used as a prophylactic drug in certain areas where only *P. vivax* is present.
- Resistance of *P. vivax* to chloroquine exists in Papua New Guinea, Indonesia and Myanmar.
- *Storage: below 30°C* –

CHLORPHENAMINE = CHLORPHENIRAMINE (Teldrin®, Trimeton®…)

Therapeutic action
– Sedating antihistaminic

Indications
– Allergic reactions (contact dermatitis, seasonal allergy; allergy to drugs, insect bites, food, etc.)

Presentation
– 4 mg tablet

Dosage
– Child from 1 to 2 years: 1 mg 2 times per day
– Child from 2 to 5 years: 1 mg every 4 to 6 hours, without exceeding 6 mg/day
– Child from 6 to 12 years: 2 mg every 4 to 6 hours, without exceeding 12 mg/day
– Adult: 4 mg every 4 to 6 hours, without exceeding 24 mg/day

AGE	**0**	**1 year**	**2 years**	**6 years**	**12 years**	**ADULT**
WEIGHT		**8 kg**	**10 kg**	**20 kg**	**30 kg**	
4 mg tablet	**Do not administer**	1/4 tab x 2	1/4 tab x 4	1/2 tab x 4	1 tab x 4	

Duration: according to clinical response; as short as possible

Contra-indications, adverse effects, precautions
– Do not administer to patients with urethro-prostatic disorders, glaucoma.
– Do not administer to children under one year.
– Do not drink alcohol during treatment.
– May cause: drowsiness (administer preferably once daily at night), dryness of the mouth, constipation, urinary retention, blurred vision.
– Risk of increased sedation when combined with alcohol and drugs acting on the central nervous system: opioid analgesics, neuroleptics (chlorpromazine, haloperidol, etc.), other antihistamines (chlorphenamine), antidepressants (clomipramine, fluoxetine, etc.), phenobarbital, etc.
– *Pregnancy: no contra-indication; no prolonged treatment*
– *Breast-feeding: avoid*

Remarks
– Chlorphenamine has no anti-emetic effect. It is less sedating than promethazine.
– Dexchlorpheniramine (Polaramine®) has the same indications:
  • child from 1 to 2 years: 0.25 mg to be repeated 2 to 3 times daily
  • child from 2 to 5 years: 0.5 mg to be repeated 4 to 6 times daily, without exceeding 3 mg/day
  • child from 6 to 12 years: 1 mg to be repeated 4 to 6 times daily, without exceeding 6 mg/day
  • adult: 2 mg to be repeated 4 to 6 times daily, without exceeding 12 mg/day
– *Storage: below 30°C* –

CHLORPROMAZINE
(Largactil®, Megaphen®, Thorazine®…)

Prescription under medical supervision

Therapeutic action
– Sedative neuroleptic

Indications
– Acute and chronic psychoses
– Agitation
– Anxiety, not controlled by other anxiolytics

Presentation
– 25 mg tablet
Also comes in 50 and 100 mg tablets.

Dosage
Varies from one person to another, doses should be increased gradually.
– Child: 1 to 1.5 mg/kg/day in 2 to 3 divided doses
– Adult: 25 to 150 mg/day in 2 to 3 divided doses

AGE	0	2 months	1 year	5 years	15 years	ADULT
WEIGHT		4 kg	8 kg	15 kg	35 kg	
25 mg tablet				1/2 tab x 3	1 to 2 tab x 3	

– Do not exceed indicated doses.
– Reduce dose by one-third or one-half for elderly patients.

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Do not administer if:
  • delirium tremens,
  • Parkinson's disease,
  • renal or hepatic failure (risk of overdosage).
– Stop treatment if patient becomes febrile: possible neuroleptic malignant syndrome.
– May cause: extrapyramidal disorders, orthostatic hypotension and photosensitisation.
– If prolonged treatment, check blood counts regularly (risk of agranulocytosis).
– Risk of increased sedation when combined with alcohol and drugs acting on the central nervous system such as diazepam, phenobarbital and chlorphenamine.
– *Pregnancy: CONTRA-INDICATED; when used in the treatment of psychosis, stop treatment one week before the expected time of delivery if possible.*
– *Breast-feeding: avoid*

Remarks
– *Storage: below 30°C* –

CIMETIDINE
(Tagamet®…)

Prescription under medical supervision

Therapeutic action

– Antiulcer agent (histamine H2-receptor antagonist)

Indications

– Prophylaxis of acid pulmonary aspiration syndrome in anaesthesia:
  • in patients with a full stomach (emergency caesarean section, etc.)
  • when a difficult intubation is expected

Presentation

– 200 mg effervescent tablet

Also comes 800 mg effervescent tablet.

Dosage and duration

– Adult: 200 to 400 mg as a single dose if possible one hour before anaesthetic induction

Contra-indications, adverse effects, precautions

– May cause: diarrhoea, headache, dizziness, skin rash, fever.
– Do not administer with an antacid (aluminium hydroxide, etc.).

Remarks

– Effervescent cimetidine can be replaced by effervescent ranitidine (Zantac®), another H2-receptor antagonist, as a single dose of 150 mg.
– The onset of acid inhibition with cimetidine non-effervescent tablets (200 mg, 400 mg and 800 mg film coated tablets) or ranitidine non-effervescent tablets (150 mg and 300 mg film coated tablets) occurs 30 minutes after administration. The effervescent tablets containing sodium citrate have a more rapid onset of action, and can thus be used for emergency surgery.
– Omeprazole (Mopral®), another antiulcer agent (proton pump inhibitor), is not compatible with emergency situations as it must be administered at least 4 hours before surgery.
– Cimetidine in film coated tablets is also used in the treatment of gastro-oesophageal reflux and peptic ulcer. Use by preference ranitidine (Azantac®) or omeprazole (Mopral®) for these indications.
– *Storage: below 30°C* –  – 

CIPROFLOXACIN
(Ciflox®…)

Prescription under medical supervision

Therapeutic action
– Fluoroquinolone antibacterial

Indications
– Severe infections due to Gram-negative bacteria: shigellosis, typhoid fever, pyelonephritis, prostatitis, septicaemia, etc.

Presentation
– 250 mg tablet

Also comes in 100 mg, 500 mg and 750 mg tablets.

Dosage and duration
Ciprofloxacin is not recommended in children under 15 years. It is however administered if considered essential:

– *Shigellosis*
  Child: 30 mg/kg/day in 2 divided doses for 3 days
  Adult: 1 g/day in 2 divided doses for 3 days
– *Typhoid fever*
  Child: 30 mg/kg/day in 2 divided doses for 5 to 7 days
  Adult: 1 g/day in 2 divided doses for 5 to 7 days
  In severe cases, continue treatment for 10 to 14 days.
– *Acute pyelonephritis*
  Adult: 1 to 1.5 g/day in 2 to 3 divided doses for 10 to 14 days
– *Acute prostatitis*
  Adult: 1 g/day in 2 divided doses for 28 days
– *Uncomplicated acute cystitis in non-pregnant women*
  Adult: 500 mg as a single dose. In the event of treatment failure with a single dose or another first-line treatment: 1 g/day in 2 divided doses for 5 days
– *Other indications*
  Child: 10 to 30 mg/kg/day (depending on severity) in 2 divided doses
  Adult: 1 to 1.5 g/day (depending on severity) in 2 divided doses

Contra-indications, adverse effects, precautions
– Do not administer to patients with history of tendinitis due to fluoroquinolones.
– May cause: gastrointestinal disturbances (nausea, vomiting, diarrhoea), neurological disorders (headache, dizziness, insomnia, hallucinations, seizures), renal disorders (crystalluria, etc.), arthralgia, myalgia, tendon damage (especially Achilles tendinitis), photosensivity (avoid exposure to sunlight), haemolytic anaemia in patients with G6PD deficiency.
– Stop treatment in the event of tendinitis.
– Administer with caution to epileptic patients.
– Reduce the dose by half in patients with renal impairment.
– Do not combine with theophylline (risk of theophylline overdose) or co-artemether.
– Do not administer simultaneously with antacids, iron salts and didanosine. Administer 2 hours apart.
– Drink a lot of liquid during treatment.
– *Pregnancy: avoid, administer only if clearly need*
– *Breast-feeding: avoid, administer only if clearly need*

Remarks
– Other fluoroquinolones (enoxacin, norfloxacin, ofloxacin, pefloxacin, etc.) have a similar spectrum of activity and indications to ciprofloxacin: see relevant literature.
– *Storage:* 

CLINDAMYCIN
(Dalacin®…)

Prescription under medical supervision

Therapeutic action

– Lincosamide antibacterial

Indications

– Second-line treatment of pneumocystosis, *in combination with primaquine*
– Second-line treatment and secondary prophylaxis of cerebral toxoplasmosis, *in combination with pyrimethamine*

Presentation

– 150 mg capsule

Also comes in 75 mg and 300 mg capsules.

Dosage and duration

– *Treatment of pneumocystosis*
  Adult: 1800 mg/day in 3 divided doses for 21 days
– *Treatment of toxoplasmosis*
  Adult: 2400 mg/day in 4 divided doses for 6 weeks
– *Secondary prophylaxis of toxoplasmosis*
  Adult: 1800 mg/day in 3 divided doses, as long as required

Contra-indications, adverse effects, precautions

– Do not administer to patients with allergy to lincosamides or history of pseudo-membranous colitis.
– May cause: diarrhoea (including severe: pseudomembranous colitis), nausea, rash, jaundice, and allergic reactions sometimes severe.
– In the event of allergic reactions, stop treatment immediately. If pseudomembranous colitis develops (mucus and false membranes), stop clindamycin and treat for *C. difficile* disease (oral metronidazole).
– Do not administer simultaneously with antacids such as aluminium hydroxide, etc.; administer 2 hours apart.
– Do not combine with: erythromycin and neuromuscular blocking drugs.
– Reduce dosage in patients with hepatic impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: administer only if there is no therapeutic alternative. Check infant's stools (risk of colitis).*

Remarks

– In some regions of South-East Asia, clindamycin is used in combination with quinine for the treatment of malaria in pregnant women and children < 8 years as the association quinine-doxycycline is contraindicated in these patients.
– *Storage: below 25°C*

CLOMIPRAMINE
(Anafranil®…)

Prescription under medical supervision

Therapeutic action
– Tricyclic antidepressant

Indications
– Depression
– Severe post-traumatic stress disorder
– Panic disorder

Presentation
– 10 mg and 25 mg tablets and capsules

Also comes in 50 mg and 75 mg tablets.

Dosage
– Adult: initially 25 mg once daily at bedtime, then increase the dose gradually up to 75 to 150 mg once daily
– Reduce doses in elderly patients and in patients with impaired renal or hepatic function: initially 10 mg/day, increased to 50 mg/day.

Duration
– 6 to 8 months minimum. The treatment should be withdrawn gradually; if signs of relapse occur, increase the dose.

Contra-indications, adverse effects, precautions
– Do not administer to patients with recent myocardial infarction, arrhythmia, severe hepatic impairment, urethro-prostatic disorders, glaucoma.
– May cause: drowsiness, dry mouth, constipation, tachycardia, orthostatic hypotension, blurred vision, urinary retention, weight gain, skin allergy, confusion in elderly patients, suicidal tendencies due to the suppression of psychomotor inhibition, exacerbation of anxiety or delusional symptoms.
– Administer with caution to patients with epilepsy, cardiovascular disease, renal or hepatic impairment.
– Do not combine with: sultopride (Barnetil®), MAO inhibitors; do not drink alcohol during treatment.
– Avoid combination with methyldopa (increased antihypotension), co-artemether.
– Monitor combination with: epinephrine and dopamine (risk of hypertensive crisis and arrhythmia), valproic acid and selective serotonin re-uptake inhibitors (increased plasma concentration of clomipramine), carbamazepine, phenytoin and rifampicin (decreased plasma concentration of clomipramine), antihypertensives, atropinic drugs.
– Closely monitor patients with suicidal tendencies, especially at the beginning of therapy.
– Advise patients that clomipramine may cause drowsiness and to be cautious when driving or operating machinery.
– *Pregnancy: avoid. However, if treatment has been started before a pregnancy, do not stop treatment; reduce dosage at the end of pregnancy (risk of withdrawal syndrome in the newborn infant).*
– *Breast-feeding: avoid*

Remarks
– The use of clomipramine is not recommended in patients aged less than 15 years.
– It takes 10 to 20 days for the patient to feel the antidepressant effect. The therapeutic efficacy can only be assessed after 3 weeks of treatment. This must be explained to the patient to encourage compliance.
– Anxiolytic or sedative treatment may be necessary during the first weeks of treatment in anxious or agitated patients.
– *Storage:*  –

CLOXACILLIN
(Cloxapen®, Orbenin®…)

Prescription under medical supervision

Therapeutic action
– Penicillin antibacterial active against penicillinase-producing staphylococci

Indications
– Infections due to staphylococci resistant to penicillin: staphylococcal pneumonia, skin infections (impetigo, furunculosis), etc.
– Parenteral to oral switch therapy (pyomyositis, septicaemia, etc.)

Presentation
– 250 mg, 500 mg and 1 g capsules
– Powder for oral solution, 125 mg/5 ml

Dosage
– Child: 50 to 100 mg/kg/day depending on severity, in 2 to 4 divided doses, without exceeding 2 g/day
– Adult: 1 to 2 g/day depending on severity, in 2 to 4 divided doses

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
250 mg capsule	–	–	1 to 2 cap x 2	2 to 3 cap x 2	4 cap x 2	
500 mg capsule	–	–		1 to 2 cap x 2	2 cap x 2	
Suspension 125 mg/5 ml	1 tsp x 2	1 to 2 tsp x 2	2 to 3 tsp x 2	–	–	

Duration
– *Skin infections*: 8 to 10 days; *staphylococcal pneumonia*: 10 to 14 days

Contra-indications, adverse effects, precautions
– Do not administer to penicillin-allergic patients.
– Administer with caution to patients allergic to cephalosporins (cross-sensitivity may occur).
– May cause: gastrointestinal disturbances, allergic reactions sometimes severe. In the event of allergic reactions, stop treatment immediately.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Take between meals.
– Dicloxacillin (Diclocil®, etc.), flucloxacillin (Floxapen®, etc.) and oxacillin (Bristopen®, etc.) are used for the same indications and at the same dosage.
– *Storage: below 25°C*

CODEINE

Prescription under medical supervision

Therapeutic action
– Opioid analgesic

Indications
– Moderate pain, alone or in combination with a non-opioid analgesic

Presentation
– 30 mg codeine phosphate tablet
Also comes in 1 mg/ml codeine phosphate syrup.

Dosage
– Child from 6 months to 12 years: 0.5 to 1 mg/kg every 4 to 6 hours
– Child over 12 years and adult: 30 to 60 mg every 4 to 6 hours; maximum 240 mg/day

Duration: according to clinical evolution

Contra-indications, adverse effects, precautions
– Do not administer to patients with acute respiratory depression or asthma attack.
– May cause:
  • constipation, nausea, vomiting, drowsiness, dizziness;
  • rarely: respiratory depression, allergic reactions, dependence, withdrawal syndrome.
– Do not combine with:
  • other agonist opioids such as morphine (increased risk of respiratory depression);
  • agonist-antagonist opioids such as buprenorphine, nalbuphine, pentazocine (competitive action).
– Reduce dosage in patients with renal or hepatic impairment and in elderly patients.
– Management of respiratory depression includes assisted ventilation and/or administration of naloxone.
– *Pregnancy: no contra-indication. The newborn infant may develop withdrawal symptoms, respiratory depression and drowsiness in the event of prolonged administration of large doses at the end of the 3rd trimester. In this event, closely monitor the newborn infant.*
– *Breast-feeding: use with caution, for a short period (2-3 days), at the lowest effective dose. Monitor the mother and the infant: in the event of excessive drowsiness, stop treatment.*

Remarks
– Administer systematically an appropriate laxative (e.g. lactulose) if analgesic treatment continues more than 48 hours.
– Codeine is also used for the short-term symptomatic treatment of:
  • diarrhoea in adult: 30 mg 3 to 4 times per day
  • dry, unproductive cough in adult: 15 to 30 mg 3 to 4 times per day
– In some countries, codeine is on the list of narcotics: follow national regulations.
– *Storage: below 30°C –*

COTRIMOXAZOLE
= SULFAMETHOXAZOLE (SMX) + TRIMETHOPRIM (TMP)
(Bactrim®…)

Prescription under medical supervision

Therapeutic action
– Combination of a sulfonamide with another antibacterial

Indications
– First-line treatment of pneumocystosis and isosporiasis
– Prophylaxis of pneumocystosis, toxoplasmosis and isosporiasis
– Brucellosis (when doxycycline is contra-indicated)

Presentation
– 400 mg SMX + 80 mg TMP and 800 mg SMX + 160 mg TMP tablets
– 100 mg SMX + 20 mg TMP tablet for paediatric use
– 200 mg SMX + 40 mg TMP/5 ml oral suspension

Dosage and duration
– *Treatment of pneumocystosis*
  Child and adult: 100 mg SMX + 20 mg TMP/kg/day in 2 divided doses
– *Treatment of isosporiasis*
  Adult: 3200 mg SMX + 640 mg TMP/day in 2 divided doses
– *Prophylaxis of pneumocystosis, toxoplasmosis and isosporiasis*
  Child: 50 mg SMX + 10 mg TMP/kg once daily, as long as necessary
  Adult: 800 mg SMX + 160 mg TMP once daily, as long as necessary
– *Brucellosis*
  Child: 40 mg SMX + 8 mg TMP/kg/day in 2 divided doses
  Adult: 1600 mg SMX + 320 mg TMP/day in 2 divided doses

Duration
– *Pneumocystosis*: 14 to 21 days depending on severity; *isosporiasis*: 10 days; *brucellosis*: 6 weeks

Contra-indications, adverse effects, precautions
– Do not administer to children under one month.
– Do not administer to sulfonamide-allergic patients; patients with severe renal or hepatic impairment.
– May cause:
  • gastrointestinal disturbances, hepatic or renal disorders (crystalluria, etc.), metabolic disorders (hyperkalaemia); neuropathy, photosensitivity, haemolytic anaemia in patients with G6PD deficiency.
  • allergic reactions (fever, rash, etc.) sometimes severe (Lyell's and Stevens-Johnson syndromes, haematological disorders, etc.). In these cases, stop treatment immediately.
  • megaloblastic anaemia due to folinic acid deficiency in patients receiving prolonged treatment (in this event, administer calcium folinate).
– Adverse effects occur more frequently in patients with HIV infection.
– In the event of prolonged treatment, monitor blood count if possible.
– Do not combine with methotrexate and phenytoin.
– Avoid combination with drugs inducing hyperkalaemia: potassium, spironolactone, enalapril, NSAIDs, heparin (increased risk of hyperkalaemia).
– Monitor combination with zidovudine (increased haematotoxicity).
– Drink a lot of liquid during treatment.
– *Pregnancy: no contra-indication. However, avoid using during the last month of pregnancy (risk of jaundice and haemolytic anaemia in the newborn infant).*
– *Breast-feeding: avoid if premature infant, jaundice, low-birth weight, infant under one month of age. If cotrimoxazole is used, observe the infant for signs of jaundice.*

Remarks
– *Storage: below 30°C*
  Once opened, oral suspension keeps for 7 days maximum.

DAPSONE
(Avlosulfon®, Disulone®…)

Prescription under medical supervision

Therapeutic action
– Sulfone antibacterial

Indications
– Prophylaxis of toxoplasmosis and pneumocystosis
– Treatment of pneumocystosis
– Paucibacillary and multibacillary leprosy, in combination with other antileprotics

Presentation
– 25 mg, 50 mg and 100 mg tablets

Dosage
– *Prophylaxis of pneumocystosis only*
Child: 2 mg/kg once daily, without exceeding 100 mg/day
Adult: 100 mg once daily
– *Prophylaxis of toxoplasmosis and pneumocystosis*
Child: 2 mg/kg once daily, without exceeding 25 mg/day (in combination with pyrimethamine 1 mg/kg once daily + folinic acid 10 mg/week)
Adult:
  • 50 mg once daily (in combination with pyrimethamine 50 mg/week + folinic acid 25 to 30 mg/week)
  • or 200 mg once weekly (in combination with pyrimethamine 75 mg/week + folinic acid 25 to 30 mg/week)
– *Treatment of pneumocystosis* (in combination with 15 mg/kg/day of trimethoprime)
Child: 2 mg/kg once daily, without exceeding 100 mg/day
Adult: 100 mg once daily
– *Paucibacillary and multibacillary leprosy*
Child under 10 years: 25 mg once daily
Child from 10 to 14 years: 50 mg once daily
Adult: 100 mg once daily

Duration
– *Prophylaxis of toxoplasmosis and pneumocystosis*: as long as necessary; *treatment of pneumocystosis*: 21 days; *paucibacillary leprosy*: 6 months; *multibacillary leprosy*: 12 months

Contra-indications, adverse effects, precautions
– Do not administer to patients with allergy to sulfones or severe anaemia (first treat anaemia).
– Administer with caution to patients with renal or hepatic impairment.
– May cause: haemolytic anaemia in patients with G6PD deficiency, dose-related haemolytic anaemia, neutropenia, methaemoglobinaemia, pruritus, rash, gastrointestinal disturbances, peripheral neuropathies, agranulocytosis; hypersensitivity reactions during the first month of treatment (fever, jaundice, hepatitis, adenopathy, exfoliative dermatitis, etc.) requiring permanent discontinuation of treatment.
– Monitor blood count and transaminases if possible.
– Do not administer simultaneously with didanosine: administer each drug 2 hours apart.
– Monitor combination with zidovudine (increased haematological toxicity).
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– For the treatment of leprosy, dapsone must always be used in combination with rifampicin (paucibacillary leprosy) or rifampicin + clofazimine (multibacillary leprosy) in order to avoid the emergence of resistance.
– *Storage: below 25°C* –  – 

DESOGESTREL
(Cerazette®…)

Therapeutic action
- Hormonal contraceptive, (low dose)progestogen

Indications
- Oral contraception

Presentation
- 75 µg (0.075 mg) tablet, 28-day pack

Dosage
- 1 tablet daily at the same time, continuously, including during menstruation
- Start:
  the first day of menstruation
  or immediately after abortion
  or after childbirth: as of the 21st day, if the woman does not breastfeed

Duration: if there are no adverse effects, as long as contraception is desired.

Contra-indications, adverse effects, precautions
- Do not administer to women with breast cancer, severe or recent liver disease, unexplained vaginal bleeding, current thromboembolic disorders.
- May cause: oligomenorrhoea, menstrual disturbances, nausea, weight gain, breast tenderness, mood changes, acne, headache.
- Hepatic enzyme inducers (rifampicin, rifabutin, nevirapine, nelfinavir, ritonavir, phenobarbital, phenytoin, carbamazepine, griseofulvin, etc.) reduce the contraceptive efficacy. Use copper intrauterine device or condoms or injectable medroxyprogesterone.
- *Pregnancy*: ***CONTRA-INDICATED***
- *Breast-feeding: it is recommended to wait 6 weeks after childbirth before starting desogestrel in breastfeeding women. However, if it is the only contraceptive method available or acceptable, it can be started 3 weeks after childbirth.*

Remarks
- Desogestrel is a possible alternative when estroprogestogens are contra-indicated or poorly tolerated; it is preferred to levonorgestrel as its contraceptive efficacy is similar to that of estroprogestogens.
- In a woman misses a tablet, she should take it as soon as possible and continue treatment as normal. If she misses by over 12 hours, contraceptive protection will be lessened, it is therefore recommended to use an additional contraceptive method: condoms for 7 days and, if she has had sexual intercourse within 5 days before forgetting the tablet, emergency contraception.
- *Storage: below 30°C*

DIAZEPAM
(Valium®…)

Prescription under medical supervision

Therapeutic action
– Anxiolytic, sedative, anticonvulsant, muscle relaxant

Indications
– Agitation and anxiety
– Muscle spasms

Presentation
– 5 mg tablet
Also comes in 2 mg and 10 mg tablets and 1% oral solution.

Dosage
– Child: 0.5 mg/kg/day in 3 divided doses
– Adult: 5 to 15 mg/day in 3 divided doses
– Do not exceed indicated doses.

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
5 mg tablet	–	–	1/4 tab x 3	1/2 tab x 3	1 tab x 3	

Duration: according to clinical response ; the shortest duration possible.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe respiratory insufficiency or severe hepatic impairment.
– Administer only in exceptions and with caution to children.
– May cause:
  • feeling of inebriation, drowsiness (administer with caution when driving or operating machinery),
  • dependence and tolerance when used for more than 10-15 days. At the end of treatment, reduce doses gradually to avoid withdrawal syndrome or rebound effect.
  • in the event of overdose: ataxia, muscular weakness, hypotension, confusion, lethargy, respiratory depression, coma.
– Reduce the dose by one half in elderly patients and in patients with renal or hepatic impairment.
– Risk of increased sedation when combined with alcohol and drugs acting on the central nervous system: opioid analgesics, neuroleptics (chlorpromazine, haloperidol, etc.), antihistamines (chlorphenamine, promethazine), antidepressants (clomipramine, fluoxetine, etc.), phenobarbital, etc.
– *Pregnancy: avoid*
– *Breast-feeding: avoid*

Remarks
– Diazepam is subject to international controls: follow national regulations.
– Diazepam is not a treatment for depression, chronic anxiety, or post-traumatic stress syndrome.
– *Storage: below 30°C –*

DIDANOSINE = ddI
(Divir®, Videx®)

Prescription under medical supervision

Therapeutic action
– Antiretroviral, HIV-1 and HIV-2 nucleoside reverse transcriptase inhibitor

Indications
– HIV-1 or HIV-2 infection, in combination with other antiretroviral drugs

Presentation
– 25 mg, 50 mg, 100 mg, 150 mg and 200 mg buffered tablets to be chewed or dispersed in at least 30 ml water (15 ml in children under 1 year)
– 125 mg, 250 mg and 400 mg enteric-coated capsules, to be taken with at least 100 ml water

Dosage
– Child under 3 months: 100 mg/m²/day in 2 divided doses
– Child from 3 months to 12 years (or over 5 kg): 240 mg/m² once daily or in 2 divided doses
– Adult under 60 kg: 250 mg once daily or in 2 divided doses
– Adult 60 kg and over: 400 mg once daily or in 2 divided doses

Weight	Daily dose	Tablets	Capsules
5 to 14 kg	100 mg	Two 50 mg tab	–
15 to 19 kg	150 mg	One 100 mg tab + one 50 mg tab	–
20 to 24 kg	200 mg	Two 100 mg tab	–
25 to 59 kg	250 mg	One 200 mg tab + one 50 mg tab	One 250 mg cap
≥ 60 kg	400 mg	Two 200 mg tab	One 400 mg cap

Duration: depending on the efficacy and tolerance of didanosine.

Contra-indications, adverse effects, precautions
– Administer with caution to patients with history of pancreatitis or hepatic disorders.
– May cause:
  • peripheral neuropathy, gastrointestinal disturbances (nausea, vomiting, diarrhoea, etc.), and rarely ophthalmic disorders (particularly in children);
  • lactic acidosis, severe pancreatic or hepatic disorders (in these events, stop antiretroviral treatment; once the symptoms have resolved, prescribe an antiretroviral regimen without didanosine).
– Do not combine with tenofovir; avoid combination with stavudine.
– Reduce dosage in patients with renal impairment.
– Do not administer simultaneously didanosine tablets with tetracyclines, fluoroquinolones and medications that need stomach acid for absorption (itraconazole, dapsone, etc.). Wait 2 hours between the administration of didanosine and these medications. This precaution does not apply to didanosine enteric-coated capsules.
– When patients receive didanosine (tablets) and indinavir, administer first indinavir, wait one hour, then administer didanosine.
– *Pregnancy: no contra-indication. Do not combine with stavudine.*

Remarks
– Didanosine should be taken 2 hours before (or at least 2 hours after) a meal.
– Tablets: patients must always take at least two tablets at a time to provide sufficient antacid.
– Also comes in powder for oral solution in 2 and 4 g vials to be diluted in an aluminium and magnesium hydroxide suspension.
– *Storage: tablets: below 30°C; capsules: below 25°C* – 

DIETHYLCARBAMAZINE
(Diethizine, Hetrazan®, Notezine®...)

Prescription under medical supervision

Therapeutic action
– Anthelminthic (antifilarial)

Indications
– Lymphatic filariasis

Presentation
– 50 mg and 100 mg tablets

Dosage
– Child under 10 years: 0.5 mg/kg as a single dose on the first day, then increase the dose gradually over 3 days to 3 mg/kg/day in 3 divided doses
– Child over 10 years and adult: 1 mg/kg as a single dose on the first day, then increase the dose gradually over 3 days to 6 mg/kg/day in 3 divided doses

Duration
– *Wuchereria bancrofti*: 12 days
– *Brugia malayi* and *timori*: 6 to 12 days

Contra-indications, adverse effects, precautions
– Do not administer to patients with onchocerciasis or heavy *Loa loa* microfilareamia; to infants, elderly patients and patients with heart or renal diseases.
– Do not administer during an acute attack.
– Administer with caution in patients with history of seizures.
– May cause:
  • nausea, vomiting, headache, dizziness, drowsiness, fever, joint pain, urticaria, transient haematuria, subcutaneous nodules, lymphangitis, localized oedema;
  • in patients with associated onchocerciasis: severe ocular damages (optic nerve lesions, retinal lesions);
  • in patients with associated loiasis: encephalitis (potentially fatal) if *Loa loa* microfilaraemia is high.
– Reduce dosage in patients with renal impairment.
– *Pregnancy: CONTRA-INDICATED (treatment may be deferred until after delivery)*
– *Breast-feeding: not recommended*

Remarks
– In countries with a national programme for the elimination of bancroftian filariasis, the combination diethylcarbamazine + albendazole is administered as a single annual dose for 4 to 6 years. This regimen is only suitable for countries that are free from *Onchocerca volvulus* and/or *Loa loa*.
– Diethylcarbamazine is included in the WHO complementary list of essential medicines.
– *Storage: between 15°C and 30°C* –

DIGOXIN
(Coragoxine®, Lanoxin®…)

Prescription under medical supervision

Therapeutic action
– Cardiotonic

Indications
– Supraventricular arrhythmias (fibrillation, flutter, paroxysmal tachycardia)
– Heart failure

Presentation
– 62.5 µg (0.0625 mg) and 250 µg (0.25 mg) tablets
Also comes in 50 µg/ml oral solution (0.05 mg/ml).

Dosage
– Adult:
  • loading dose: 750 to 1500 µg (0.75 to 1.5 mg) in 3 to 4 divided doses. Do not exceed 1500 µg during the first 24 hours.
  • maintenance dose: 125 to 250 µg/day (0.125 to 0.25 mg) once daily or in 2 divided doses
– Reduce the dose by one half in elderly patients and in patients with renal impairment.

Duration
– According to clinical response

Contra-indications, adverse effects, precautions
– Do not administer to patients with bradycardia, ill defined arrhythmia, coronary artery disease.
– It is essential to monitor pulse in the initial stage of treatment.
– Narrow margin between therapeutic and toxic dose.
– May cause in the event of overdose: gastrointestinal disturbances (nausea, vomiting, diarrhoea), blurred vision, headache, confusion, conduction and rhythm disorders. If so, reduce dose or stop treatment.
– Do not combine with calcium, particularly by IV route (serious arrhythmias).
– Monitor combination with:
  • amiodarone, macrolides, itraconazole, quinine, chloroquine (increased digoxin concentration),
  • potassium-depleting drugs: diuretics, corticoids, amphotericin B (increased risk of digoxin toxicity).
– Monitor if possible serum potassium level in patients taking potassium-depleting drugs and serum creatinine level in patients with renal impairment.
– Do not administer simultaneously with antacids such as aluminium hydroxide, etc., administer 2 hours apart.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– A loading dose may be administered in arrhythmias if a rapid digitalisation is required. It is usually not necessary for heart failure.
– *Storage: below 30°C –* 

DOXYCYCLINE
(Vibramycin®…)

Prescription under medical supervision

Therapeutic action
– Tetracycline antibacterial

Indications
– Cholera, relapsing fevers, rickettsioses, bubonic plague, leptospirosis, anthrax, endemic treponematoses, syphilis, chlamydial genital infections, atypical pneumonia; brucellosis (in combination with streptomycin or rifampicin)
– Onchocerciasis, lymphatic filariasis; falciparum malaria (in combination with quinine)

Presentation
– 100 mg tablet or capsule

Dosage
– *Cholera, louse-borne relapsing fever, epidemic typhus*
  Child: 100 mg as a single dose
  Adult: 200 mg as a single dose (for cholera, 300 mg as a single dose)
– *Other indications*
  Child over 8 years: 100 mg once daily or in 2 divided doses (up to 200 mg/day in severe infections)
  Adult: 100 to 200 mg once daily or in 2 divided doses, depending on indication

Duration
– *Leptospirosis, chlamydial cervicitis, malaria*: 7 days; *anthrax, atypical pneumonia*: 7-10 days; *tick-borne relapsing fever, bubonic plague*: 10 days; *pelvic inflammatory disease, endemic treponematoses, lymphogranuloma venereum, syphilis*: 14 days; *brucellosis, onchocerciasis, lymphatic filariasis*: 6 weeks

Contra-indications, adverse effects, precautions
– Do not administer to children under 8 years (may damage teeth) and to tetracycline-allergic patients.
– Administer with caution to patients with hepatic or renal impairment.
– May cause: gastrointestinal disturbances, allergic reactions, photosensitivity, oesophageal ulcerations (to avoid oesophageal ulceration, take doxycycline during meals, with a glass of water, in a upright position).
– Do not give simultaneously with ferrous salts, zinc, calcium, aluminium or magnesium hydroxide, didanosine, milk: administer at least 2 hours apart.
– *Pregnancy: **CONTRA-INDICATED** during the 2nd and 3rd trimester*
– *Breast-feeding: avoid if possible (risk of infant teeth discoloration), except if there is no alternative.*

Remarks
– Patients infected with *C. trachomatis* are often coinfected with *N. gonorrhoeae*. Therefore, all patients with chlamydia should receive an effective treatment for gonorrhoea.
– *Storage: below 30°C –*
  Never use out-of-date tetracyclines (risk of renal acidosis).

EFAVIRENZ = EFV = EFZ
(Aviranz 600®, Efavir 600®, Stocrin®, Sustiva®)

Prescription under medical supervision

Therapeutic action
– Antiretroviral, HIV-1 non nucleoside reverse transcriptase inhibitor

Indications
– HIV-1 infection, in combination with other antiretroviral drugs

Presentation
– 50 mg, 100 mg and 200 mg capsules and 50 mg, 200 mg and 600 mg tablets
– 30 mg/ml oral solution

Dosage
– The dose is given once daily at bedtime:

Weight	Oral solution 30 mg/ml	Capsules or tablets
10 to 14 kg	9 ml	200 mg
15 to 19 kg	10 ml	250 mg
20 to 24 kg	12 ml	300 mg
25 to 32 kg	15 ml	350 mg
33 to 39 kg	–	400 mg
≥ 40 kg	–	600 mg

Duration: depending on the efficacy and tolerance of efavirenz.

Contra-indications, adverse effects, precautions
– Do not administer to children less than 3 years of age.
– Avoid administration in patients with severe hepatic impairment.
– Administer with caution to patients with psychiatric disorders (or history of) or epilepsy.
– May cause:
  • neurological disorders (dizziness, insomnia, drowsiness, abnormal dreaming, impaired concentration, seizures);
  • psychiatric disorders (severe depression, suicidal ideation);
  • raised liver enzymes (ALAT);
  • skin reactions, possibly severe (Stevens-Johnson syndrome).
– When efavirenz is used concomitantly with oestrogen-progestogen oral contraceptives: increased risk of thromboembolism due to ethinylestradiol.
– *Pregnancy: avoid; effective contraception must be used during treatment.*

Remarks
– Oral solution requires higher doses than capsules or tablets.
– Also comes in fixed-dose combination tablet containing efavirenz-zidovudine-lamivudine.
– *Storage: below 30°C*
  Once opened, oral solution keeps for 30 days maximum.

ENALAPRIL
(Renitec®…)

Prescription under medical supervision

Therapeutic action

– Antihypertensive, vasodilator (angiotensin-converting enzyme inhibitor)

Indications

– Hypertension
– Congestive heart failure

Presentation

– 2.5 mg, 5 mg and 20 mg tablets

Dosage and duration

– *Hypertension*
  Adult: initially 5 mg once daily, then increase the dose every 1 to 2 weeks, according to blood pressure, up to 10 to 40 mg once daily or in 2 divided doses
  In elderly patients, patients taking a diuretic or patients with renal impairment: start with 2.5 mg once daily as there is a risk of hypotension and/or acute renal impairment.
– *Congestive heart failure*
  Adult: 2.5 mg once daily, then increase the dose over 2 to 4 weeks, up to 10 to 20 mg once daily or in 2 divided doses

Contra-indications, adverse effects, precautions

– Do not administer to patients with history of hypersensitivity to enalapril.
– May cause:
  • hypotension, dry cough at night, hyperkalaemia, headache, dizziness, nausea, renal impairment,
  • allergic reactions, angioedema,
  • rarely: hepatitis, neutropenia and agranulocytosis in immunodeficient patients, anaemia in patients with chronic renal impairment.
– Reduce dosage in patients with renal impairment.
– Do not combine with potassium-sparing diuretics (spironolactone) or potassium.
– Monitor, if possible, serum creatinine and potassium levels (hyperkalaemia is frequent but of no concern if it remains below 5.5 mEq/litre).
– In patients taking a diuretic, reduce the dose of the diuretic when adding enalapril.
– *Pregnancy*: ***CONTRA-INDICATED***
– *Breast-feeding*: *no contra-indication at recommended doses*

Remarks

– Captopril (Lopril®, etc.) has the same indications as enalapril, however its dosage differs and it must be taken 2 to 3 times daily.
– *Storage*: *below 30°C* –

ERGOCALCIFEROL = VITAMIN D2
and COLECALCIFEROL = VITAMIN D3

Prescription under medical supervision

Therapeutic action

– Vitamin necessary for the intestinal absorption of calcium and phosphate and for normal bone calcification

Indications

– Prevention and treatment of vitamin D deficiencies (rickets, osteomalacia)

Presentation

– 1.25 mg tablet or capsule (50 000 IU)
– 250 µg/ml oral suspension (10 000 IU/ml)

Also comes in different strengths, depending on the manufacturers.

Dosage and duration

Ergocalciferol and colecalciferol are used at the same doses:

– *Prevention of vitamin D deficiencies*
  • 50 000 IU tablet or capsule:
    Child under 5 years: 100 000 IU every 3 months, during periods of limited sunlight
    Child over 5 years and adult: 100 000 IU every 3 months or 200 000 IU every 6 months
    Pregnant woman: 100 000 IU around the 6th-7th month of pregnancy
  • 10 000 IU/ml oral suspension:
    Child and adult: 400 IU once daily (10 µg daily) during periods of limited sunlight

  For children rarely exposed to sunlight or dark-skinned children, doses may be doubled.

– *Treatment of vitamin D deficiencies*
  Child and adult: 800 to 4000 IU once daily (20 to 100 µg daily) for 6 to 12 weeks, then continue with preventive dose

– Do not exceed 600 000 IU/year.

Contra-indications, adverse effects, precautions

– Do not administer to patients with hypercalcaemia, hypercalciuria, calcic lithiasis.
– Stop treatment if signs of overdosage occur: headache, anorexia, nausea, vomiting, increased thirst, polyuria.
– Avoid combination with thiazide diuretics (hydrochlorothiazide, etc.).
– Monitor, if possible, calcaemia and calciuria during curative treatment.
– Combine with a calcium supplementation at the start of curative treatment (500 mg to 1 g/day).
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication. When curative treatment is being administered to the mother, do not give vitamin D to the child.*

Remarks

– The number of IU per drop of oral solution varies according to manufacturers. Check instructions for use.
– Vitamin D2 and D3 also come in ampoules for oral and/or parenteral use.
– *Storage: below 25°C –* 
  Once opened, oral solution keeps 3 months.

ERGOMETRINE (Ergotrate®…) and METHYLERGOMETRINE (Methergin®…)

Prescription under medical supervision

Therapeutic action
– Uterine stimulant

Indications
– Haemorrhage due to uterine atony after delivery or abortion
– Heavy menorrhagia in non-pregnant women

Presentation
– Ergometrine maleate: 200 µg tablet
– Methylergometrine maleate: 125 µg tablet

Dosage
– Ergometrine: 200 to 400 µg, 3 times daily
– Methylergometrine: 125 to 250 µg, 3 times daily

Duration: according to clinical response, 2 to 3 days

Contra-indications, adverse effects, precautions
– Do not administer during delivery.
– Do not administer before complete delivery of placenta.
– Do not administer to patients with hypersensitivity to ergot derivatives (cabergoline, bromocriptine, ergotamine, etc.), severe hypertension, pre-eclampsia or eclampsia.
– May cause: gastrointestinal disturbances, headache, paraesthesia, confusion, dizziness, tinnitus, hypertension, peripheral vasoconstriction.
– Do not combine with another ergot derivative.
– Monitor combination with: metronidazole, azole antifungals, macrolides, protease inhibitors, efavirenz, fluoxetine (risk of ergotism).
– *Pregnancy*: ***CONTRA-INDICATED***
– *Breast-feeding*: *avoid, except if clearly needed and for less than 3 days (may inhibit lactation)*

Remarks
– In emergencies, use injectable route; oral treatment is not suitable for the management of severe haemorrhage.
– Do not confuse ergometrine with ergotamine, another ergot derivative used in the treatment of migraine.
– Ergometrine is also called ergonovine or ergobasine.
– *Storage: below 30°C* –

ERYTHROMYCIN
(Erythrocin®, Pantomicina®, Propiocine®…)

Prescription under medical supervision

Therapeutic action
– Macrolide antibacterial

Indications
– Treatment of leptospirosis, non-veneral treponematoses (pian, bejel, pinta), otitis media, tonsillitis, diphtheria, pneumonia, streptococcal skin infections (erysipela, impetigo), genital infections (chancroid, chlamydial infections, syphilis), etc., when first-line treatment cannot be used (allergy, contra-indication, etc.)
– Chlamydial neonatal conjunctivitis

Presentation
– 250 mg and 500 mg tablets or capsules
– Powder of oral suspension, 125 mg/5 ml

Dosage
– Child: 30 to 50 mg/kg/day in 2 to 3 divided doses
– Adult: 2 to 3 g/day in 2 to 3 divided doses

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
250 mg tablet	1/4 tab x 2	1/2 tab x 2	1 tab x 2	2 to 3 tab x 2	4 tab x 2	
500 mg tablet	–	1/4 tab x 2	1/2 tab x 2	1 to 2 tab x 2	2 tab x 2	
125 mg/5 ml oral susp.	1/2 tsp x 3	1/2 to 1 tsp x 3	1 to 2 tsp x 3	–	–	

Duration
– *Leptospirosis, non-veneral treponematoses, diphtheria, chancroid, genital chlamydiasis*: 7 days
– *Syphilis, lymphogranuloma venereum, chlamydial conjunctivitis*: 14 days
– *Other indications*: 5 to 14 days, depending on pathology.

Contra-indications, adverse effects, precautions
– Do not administer to patients with allergy to erythromycin or another macrolide.
– Do not combine with: ergot derivatives, aminophylline and theophylline (especially in paediatrics), lumefantrine, carbamazepine.
– Monitor combination with digoxin (increased plasma concentration of digoxin).
– May cause: allergic reactions, gastrointestinal disturbances.
– Administer with caution to patients with hepatic or renal impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Take between meals.
– *Storage: below 30°C* –

ETHAMBUTOL
(Dexambutol®, Myambutol®…)

Prescription under medical supervision

Therapeutic action
- Antituberculous antibacterial

Indications
- Treatment of tuberculosis, *in combination with other antituberculous antibacterials*

Presentation
- 100 mg and 400 mg tablets

Dosage
- Child: 20 mg/kg once daily
- Adult: 15 mg/kg once daily
- Do not exceed 1200 mg/day

Duration: according to protocol

Contra-indications, adverse effects, precautions
- Do not administer to patients with severe renal impairment or coexisting visual defects (e.g. diabetic retinopathy, cataract).
- May cause: retrobulbar optic neuritis. Patients should be warned that they must immediately stop treatment and seek medical attention in the event of visual disturbances such as blurred vision, reduced visual acuity, blind spot (scotoma), green-red colour blindness. Visual alterations are usually reversible a few weeks after stopping ethambutol. The dosage must be carefully adjusted to the body weight (adverse effects are dose-dependant), especially for children less than 5 years, as it is more difficult to detect visual alterations at this age.
- *Pregnancy: no contra-indication*
- *Breast-feeding: no contra-indication*

Remarks
- Fixed dose combinations (isoniazid+rifampicin+pyrazinamide+ethambutol or isoniazid+ethambutol) should be preferred.
- *Storage: below 30°C*

ETHINYLESTRADIOL + LEVONORGESTREL (Microgynon 30®, Minidril®…)

Prescription under medical supervision

Therapeutic action
- Combined hormonal contraceptive, estrogen-progestogen

Indications
- Oral contraception

Presentation
- 21-day pack: 21 active tablets of 30 µg ethinylestradiol + 150 µg levonorgestrel
- 28-day pack: 21 active tablets of 30 µg ethinylestradiol + 150 µg levonorgestrel and 7 inactive tablets

Dosage
- Start the first day of menstruation or immediately after abortion or as of the 21st day after childbirth, if the woman does not breastfeed.
- 21-day pack: 1 tablet daily at the same time, for 21 days, followed by a tablet-free interval of 7 days
- 28-day pack: 1 tablet daily at the same time, with no interruption, even during menstruation

Duration: if there are no adverse effects, as long as contraception is desired.

Contra-indications, adverse effects, precautions
- Do not administer to women with breast cancer, uncontrolled hypertension, non equilibrated or complicated diabetes, history of thromboembolic disorders, coronary insufficiency, valvular disease, stroke, severe or recent liver disease, unexplained vaginal bleeding, migraine with neurological signs, renal impairment, hyperlipidaemia, to women smokers over age 35.
- May cause: oligo-amenorrhoea, vaginal candidiasis, nausea, weight gain, breast tenderness, mood changes, acne and headache. Other rare and severe adverse effects require discontinuation of treatment: hypertension, cardiovascular and thromboembolic disorders, jaundice, hepatic adenoma, migraine, visual disturbances.
- Hepatic enzyme inducers (rifampicin, rifabutin, nevirapine, nelfinavir, ritonavir, phenobarbital, phenytoin, carbamazepine, griseofulvin, etc.) reduce the contraceptive efficacy. Use a non-hormonal contraceptive method (copper intrauterine device, condoms) or an oral contraceptive containing 50 µg ethinylestradiol (however there is still a risk of contraceptive failure and the risk of adverse effects is increased) or injectable medroxyprogesterone.
- Clinical examinations must be carried out before (blood pressure, breasts) and during treatment (blood pressure).
- *Pregnancy*: **CONTRA-INDICATED**
- *Breast-feeding*: **CONTRA-INDICATED** *before 6 weeks; not recommended between 6 weeks and 6 months (except if it is the only available or acceptable contraceptive method); no contra-indication after 6 months.*

Remarks
- In a woman misses an active tablet, she should take it as soon as possible and continue treatment as normal. If she misses by over 12 hours, contraceptive protection will be lessened, it is therefore recommended to use an additional contraceptive method: condoms for 7 days and, if she has had sexual intercourse within 5 days before forgetting the tablet, emergency contraception.
- 28-day packs can simplify use as there is no interruption between two packs. Explain to the woman which are active and inactive tablets. She must be careful not to start with inactive tablets.
- *Storage: below 30°C*

FERROUS SALTS

Therapeutic action
– Antianaemia drug

Indications
– Prevention and treatment of iron-deficiency anaemia

Presentation
– 200 mg ferrous sulfate tablet containing 65 mg of elemental iron

Also comes in syrup and in different compositions and strengths.

Dosage (expressed in elemental iron)
– *Prevention of iron-deficiency anaemia*

Child under 5 years: 2 mg/kg once daily	= 1/4 tab/day
Child over 5 years: 30 to 60 mg once daily	= 1/2 to 1 tab/day
Pregnant woman: 60 to 120 mg once daily or in 2 divided doses	= 1 to 2 tab/day

– *Treatment of iron-deficiency anaemia*

Child under 2 years: 30 mg/day in 2 divided doses	= 1/2 tab/day
Child from 2 to 12 years: 120 mg/day in 2 divided doses	= 2 tab/day
Adult: 120 to 180 mg/day in 2 to 3 divided doses	= 2 to 3 tab/day

– Do not exceed indicated doses.

Duration
– *Prevention*: during risk period (pregnancy, malnutrition)
– *Treatment*: 3 months

Contra-indications, adverse effects, precautions
– Do not administer to patients with sickle-cell anaemia.
– May cause: gastrointestinal disturbances (epigastric pain, diarrhoea or constipation, black stools).
– Do not exceed recommended doses, especially in children.
– Toxic dose: 30 mg/kg of elemental iron (100 mg/kg of ferrous sulfate).
– Signs of overdose: bloody diarrhoea, heart failure.
– Absorption of both ferrous salts and doxycycline or antacids is decreased when they are given concomitantly. Administer each drug at least 2 hours apart.
– Do not administer simultaneously with doxyccline or antacids: administer 2 hours apart.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Take during meals to reduce gastrointestinal disturbances.
– For treatment, preferably use tablets containing both ferrous salts and folic acid.
– Other ferrous salts may be used. Ensure the dose of elemental iron is the same as that indicated above (200 mg ferrous fumarate = 65 mg elemental iron; 300 mg ferrous gluconate = 35 mg elemental iron).
– *Storage: below 30°C*

FOLIC ACID = VITAMIN B9

Prescription under medical supervision

Therapeutic action
– Antianaemia drug

Indications
– Treatment of folate-deficient megaloblastic anaemias: severe malnutrition, repeated attacks of malaria, intestinal parasitosis, etc.

Presentation
– 1 mg and 5 mg tablets

Dosage and duration
– Child under 1 year: 0.5 mg/kg once daily for 4 months
– Child over 1 year and adult: 5 mg once daily for 4 months; 15 mg once daily in malabsorption states

AGE	0	2 months	1 year	5 years	15 years	ADULT
WEIGHT		4 kg	8 kg	15 kg	35 kg	
5 mg tablet	1/2 tab	1 tab	1 tab	1 tab	1 tab	

Contra-indications, adverse effects, precautions
– Do not combine with sulfadiazine-pyrimethamine in patients with toxoplasmosis nor sulfadoxine-pyrimethamine (Fansidar®) in patients with malaria: folic acid reduces the efficacy of these treatments.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Folic acid must not be used for the treatment of anaemia due to antifolates (pyrimethamine, trimethoprim or methotrexate). Use folinic acid.
– Folic acid is also used for primary and secondary prophylaxis of neural tube defects and for prophylaxis of acute anaemia in patients with sickle-cell anaemia.
– *Storage: below 30°C –*

FERROUS SALTS + FOLIC ACID

Indications
– Prevention of iron and folic acid deficiency, mainly during pregnancy
– Treatment of iron deficiency

Presentation
– Tablet of 200 mg ferrous sulfate (65 mg of elemental iron) + 400 µg folic acid

Dosage
– See ferrous salts

Remarks
– This fixed-dose combination is not effective for the treatment of folic acid deficiency because of its low dose.
– *Storage: below 30°C –*

FLUCONAZOLE
(Triflucan®…)

Prescription under medical supervision

Therapeutic action

– Antifungal

Indications

– Treatment of oesophageal candidiasis in immunocompromised patients
– Second line treatment of oropharyngeal and vaginal candidiasis, when local treatment fails
– Secondary prophylaxis of oropharyngeal and oesophageal candidiasis, in the event of severe and/or frequent recurrences
– Treatment of systemic candidiasis
– Treatment of cryptococcal infections, after induction therapy with amphotericin B
– Secondary prophylaxis of cryptococcal infections

Presentation

– 50 mg capsule
– Powder for oral suspension, 50 mg/5 ml

Also comes in 100 mg, 150 mg and 200 mg capsules, and 200 mg/5 ml oral suspension.

Dosage and duration

– *Treatment of oesophageal candidiasis*
  Child: 3 mg/kg once daily (maximum 12 mg/kg/day) for 14 to 21 days
  Adult: 100 to 200 mg once daily (maximum 400 mg/day) for 14 to 21 days

– *Treatment of oropharyngeal candidiasis*
  Child: 3 mg/kg once daily for 7 to 14 days
  Adult: 100 mg once daily for 7 to 14 days

– *Treatment of vaginal candidiasis*
  Adult: 150 mg as a single dose (to be repeated after 72 hours if severe)

– *Secondary prophylaxis of oropharyngeal and oesophageal candidiasis*
  Child: 3 to 6 mg/kg once daily, as long as necessary
  Adult: 100 to 200 mg once daily (maximum 400 mg/day), as long as necessary

– *Treatment of systemic candidiasis*
  Child: 6 to 12 mg/kg once daily for at least 4 to 6 weeks
  Adult: 200 to 400 mg once daily for at least 4 to 6 weeks

– *Treatment of cryptococcal infections* (after 2 weeks' therapy with IV amphotericin B)
  Child: 6 to 12 mg/kg once daily for 8 weeks
  Adult: 400 mg once daily for 8 weeks

– *Secondary prophylaxis of cryptococcal infections*
  Child: 3 to 6 mg/kg once daily, as long as necessary
  Adult: 200 mg once daily, as long as necessary

Warning: the above doses should be administered every 72 hours to infants aged 0 to 2 weeks and every 48 hours to infants aged 2 to 4 weeks.

Contra-indications, adverse effects, precautions

- Do not administer to patients with hypersensitivity to azole antifungals (itraconazole, ketoconazole, miconazole, etc.).
- May cause:
  - gastrointestinal disturbances, headaches, rashes (possibly severe: Stevens Johnson syndrome), anaphylactic reactions, hepatitis,
  - raised transaminases, leukopenia, thrombocytopenia.
- Stop treatment in the event of signs of hepatic disease and/or serious cutaneous reactions.
- In the event of hepatic or renal impairment: reduce the dose and monitor hepatic function.
- Do not combine with co-artemether or halofantrine (risk of *torsades de pointe*).
- Monitor combination with: oral anticoagulants (risk of haemorrhage), oral antidiabetics (risk of hypoglycaemia), phenytoin, theophylline and aminophylline, benzodiazepines, ergometrine (increases plasma concentration of these medicines).
- Do not administer simultaneously with rifampicine, administer 12 hours apart (rifampicine in the morning, fluconazole in the evening).
- *Pregnancy*: **CONTRA-INDICATED** *during the first trimester, except if vital and there is no other therapeutic alternative*
- *Breast-feeding*: **CONTRA-INDICATED**

Remarks

- For the treatment of oropharyngeal candidiasis, use preferably miconazole muco-adhesive buccal tablets, clotrimazole or nystatin lozenges.
- For the treatment of vaginal candidiasis, use clotrimazole vaginal tablets as first line treatment.
- *Storage: below 30°C –* 
  Once reconstituted, oral suspension keeps 14 days.

FLUOXETINE
(Fluctine®, Prozac®…)

Prescription under medical supervision

Therapeutic action
– Antidepressant (selective serotonin re-uptake inhibitor)

Indications
– Depression
– Severe post-traumatic stress disorder

Presentation
– 10 mg and 20 mg capsules or tablets

Also comes in 20 mg/5 ml oral solution.

Dosage
– Adult: 20 mg once daily. For patients who have only a partial clinical response after 15 days, dosage may be increased to 40 mg/day (up to 60 mg/day if needed).
– Reduce doses in elderly patients and in patients with impaired hepatic function (administer on alternate days).

Duration
– 6 to 8 months minimum. The treatment should be withdrawn gradually; if signs of relapse occur, increase the dose.

Contra-indications, adverse effects, precautions
– Do not administer to patients aged less than 15 years; to patients with hypersensitivity to fluoxetine.
– May cause, especially at the beginning of therapy:
  • nervousness, insomnia, drowsiness, headache, suicidal tendencies due to the suppression of psychomotor inhibition, exacerbation of anxiety or delusional symptoms,
  • gastrointestinal disturbances, allergic reactions, hypoglycaemia (particularly in diabetic patients, closely monitor blood glucose), confusion due to hyponatraemia, haemorrhage.
– Do not combine with MAOIs; do not drink alcohol during treatment.
– Administer with caution to patients with epilepsy, glaucoma, cardiac disease, hepatic or renal impairment, thyroid dysfunction, coagulation disorders.
– Monitor combination with: oral anticoagulants (risk of haemorrhage), carbamazepine, phenytoin, tricyclic antidepressants and ergometrine (increased plasma concentration of these drugs), lithium, tramadol, pethidine.
– Closely monitor patients with suicidal tendencies, especially at the beginning of therapy.
– Advise patients that fluoxetine may cause drowsiness and to be cautious when driving or operating machinery.
– *Pregnancy: avoid. However, if treatment has been started before a pregnancy, do not stop treatment; reduce dosage at the end of pregnancy (risk of withdrawal syndrome in the newborn infant).*
– *Breast-feeding: avoid (safety is not established)*

Remarks
– It takes 10 to 20 days for the patient to feel the antidepressant effect. The therapeutic efficacy can only be assessed after 3 weeks of treatment. This must be explained to the patient to encourage compliance.
– Anxiolytic or sedative treatment may be necessary during the first weeks of treatment in anxious or agitated patients.
– *Storage:*

FOSFOMYCIN TROMETHAMINE
(Monuril®…)

Prescription under medical supervision

Therapeutic action
– Antibacterial

Indicaciones
– Acute uncomplicated cystitis, without fever nor flank pain, in women
– Asymptomatic bacteriuria in pregnant women

Presentation
– Granules for oral solution in 3 g sachet, to be dissolved in water

Dosage and duration
– 3 g as a single dose

Contra-indications, adverse effects, precautions
– This single-dose treatment is not indicated in severe (pyelonephritis) or complicated urinary tract infections (infection in catheterised patients, in men, in patients with urinary stones; infection due to multi-resistant organisms) and in recurrent cystitis.
– Do not administer to patients with severe renal impairment, hypersensitivity to fosfomycin.
– May cause (rarely): gastrointestinal disturbances, skin rash.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– First perform urinary test (reagent strip). If the test is negative (no leukocytes, no nitrites), a urinary infection is very unlikely.
– In the treatment of cystitis, symptoms should improve within 3 days of treatment. If not, the patient should consult again. Treatment failure may be due to the presence of naturally fosfomycin-resistant organisms (*Staphylococcus saprophyticus*).
– Fosfomycin is not included in the WHO list of essential medicines.
– *Storage: below 30°C* –

FUROSEMIDE = FRUSEMIDE
(Lasilix®, Lasix®, Seguril®…)

Prescription under medical supervision

Therapeutic action
– Diuretic

Indications
– Oedema caused by renal, hepatic or congestive heart failure
– Hypertension (prefer hydrochlorothiazide for this indication)

Presentation
– 40 mg tablet
Also comes in 20 mg tablet.

Dosage
– Child: 1 to 2 mg/kg once daily
– Adult: 20 to 40 mg once daily

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
40 mg tablet			1/4 tab	1/2 tab	1 tab	

– Reduce doses according to clinical response.
– In case of persistant oedema: 80 to 150 mg once or in 2 divided doses, then reduce dosage.

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Do not administer for other types of oedema, especially those due to kwashiorkor.
– May cause:
  • hypokalaemia (especially in case of cirrhosis), poor nutritional status, congestive heart failure (furosemide enhances toxicity of digoxin);
  • dehydration and orthostatic hypotension.
– *Pregnancy: avoid, do not use for hypertension in pregnancy*
– *Breast-feeding: avoid (excreted in milk and may reduce milk production)*

Remarks
– Give in the morning.
– A lot of fruit should be eaten during treatment (dates, bananas, mangos, oranges, etc.) in order to supply additional potassium. Use potassium tablets as well if available.
– *Storage:* no special temperature requirements –

GLIBENCLAMIDE
(Daonil®, Euglucon®…)

Prescription under medical supervision

Therapeutic action
– Sulphonylurea hypoglycaemic which stimulates secretion of pancreatic insulin

Indications
– Adult-onset diabetes, insulin-independent and not controlled by well followed diet
Measurement of blood glucose levels is essential in establishing diagnosis and control of the disease process.

Presentation
– 2.5 mg and 5 mg tablets
Also comes in 1.25 mg tablet.

Dosage
– Adult: initially, 2.5 to 5 mg once daily in the morning
Adjust dosage until diabetic control is obtained; maximum dose: 15 mg/day.
Adjust dosage gradually and very cautiously for elderly patients.

Duration: according to clinical response and laboratory tests

Contra-indications, adverse effects, precautions
– Do not administer if:
  • insulin-dependent diabetes, juvenile diabetes mellitus;
  • renal, hepatic or thyroid function impairment, allergy to sulphonamides.
– May cause:
  • hypoglycaemia due to excessive doses, especially in elderly patients; insufficient intake of sugar; hepatic or renal failure. Treat mild hypoglycaemia with intake of oral sugar and IV injection of hypertonic glucose solution if severe; adjust dosage;
  • allergic reactions.
– Avoid combination with: co-trimoxazole, aspirin and other anti-inflammatory drugs, beta-blockers (risk of hypoglycaemia), barbiturates, glucocorticoids, oral contraceptives (antagonise hypoglycaemic effect), etc.
– Avoid combination with alcohol: antabuse reaction.
– *Pregnancy*: CONTRA-INDICATED *during the third trimester*
– *Breast-feeding*: CONTRA-INDICATED

Remarks
– Use only when diabetes cannot be controlled with diet alone, and monitor blood-glucose levels regularly.
– Use of oral antidiabetics does not mean dietetic measures should be cancelled.
– Insulin may be required in patients having surgery.
– Chlorpropamide (Diabinese®) is a long-acting sulphonylurea hypoglycaemic used at doses of 125 to 250 mg once daily. Risk of hypoglycaemia is higher than with other antidiabetics.
– *Storage: below 30°C* –

GLYCERYL TRINITRATE = NITROGLYCERIN = TRINITRIN

Prescription under medical supervision

Therapeutic action
– Vasodilator, antianginal

Indications
– Short-term prophylaxis and treatment of angina

Presentation
– 0.5 mg sublingual tablet

Dosage
– *Short-term prophylaxis of acute angina (sublingually)*
  Adult: 0.5 to 1 mg taken 5 to 10 minutes before a precipitating event (exercise, stress, etc.)
– *Treatment of acute angina (sublingually)*
  Adult: 0.5 to 1 mg, to be repeated 1 to 3 times at 3-4 minute intervals
  Maximum dose: 3 mg/day

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Do not administer to patients with obstructive cardiomyopathy, hypotension, shock.
– May cause: orthostatic hypotension (especially in elderly patients), headache, nausea, flushing of the face, haemolysis in patients with G6PD deficiency, severe hypotension with risk of circulatory collapse in the event of overdose.
– Use the lowest effective dose in patients taking another nitrate derivative, a vasodilator or an antihypertensive drug and in elderly patients.
– Combination with antihypertensive drugs, diuretics, vasodilators and alcohol enhances hypotensive effects.
– Do not combine with sildenafil (risk of acute coronary syndrome).
– *Pregnancy: not recommended (safety is not established)*
– *Breast-feeding: not recommended (safety is not established)*

Remarks
– Tablet must be crunched first, then slowly dissolved under the tongue.
– Antianginal effect appears within less than 5 minutes and persists for less than 1 hour.
– Sustained-release formulations (Sustac®, etc.) are used for the long-term management of angina and the treatment of congestive heart failure.
– *Storage: below 25°C, preferably in airtight glass container.*  – 

GRISEOFULVIN
(Fulcine®, Grisefuline®, Grisovin®…)

Prescription under medical supervision

Therapeutic action
– Antifungal

Indications
– Dermatophyte infections of:
  • scalp (scalp ringworm)
  • skin (ringworm of the trunk, groin, foot)
  • nails

Presentation
– 125 mg and 250 mg tablets
Also comes in 500 mg tablet.

Dosage
– Child: 10 to 20 mg/kg once daily or in 2 divided doses, during meals
– Adult: 500 mg to 1 g once daily or in 2 divided doses, during meals (do not exceed 1 g/day)

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
125 mg tablet	–	1/2 tab	1 tab	2 tab	–	
250 mg tablet	–	–	1/2 tab	1 tab	2 to 4 tab	
500 mg tablet	–	–	–	1/2 tab	1 to 2 tab	

Duration
– *Scalp*: 6 to 12 weeks
– *Skin*: 4 to 8 weeks
– *Nails*: 6 months (fingernails); 12 months or more (toenails)

Contra-indications, adverse effects, precautions
– Do not administer to patients with allergy to griseofulvin, hepatic impairment.
– May cause: gastrointestinal disturbances, headache, dizziness, peripheral neuropathy, skin allergic reactions, photosensitivity, haematologic disorders.
– Griseofulvin reduces:
  • the effect of oral anticoagulants: monitor prothrombine time,
  • the effect of oral contraceptives: use another contraceptive method.
– Avoid alcohol during treatment (antabuse effect).
– *Pregnancy*: **CONTRA-INDICATED**
– *Breast-feeding*: **CONTRA-INDICATED**

Remarks
– Apply gentian violet solution to lesions.
– *Storage: below 30°C* –

HALOFANTRINE
(Halfan®…)

Prescription under medical supervision

The drug must only be used in hospital settings. Its potential cardiotoxicity is unpredictable, even with the aid of an ECG.

Therapeutic action
– Antimalarial

Indications
– Treatment of uncomplicated falciparum malaria, when no other effective antimalarial is available, never as first-line treatment

Presentation
– 250 mg tablet
– 100 mg/5 ml oral suspension

Dosage
– Child over 1 year or over 10 kg: 24 mg/kg in 3 divided doses every 6 hours, between meals
– Adult: 1500 mg in 3 divided doses every 6 hours, between meals
– Do not exceed indicated doses.

Duration: one day

Contra-indications, adverse effects, precautions
– Do not administer to patients with hypersensitivity to halofantrine, cardiopathy, bradycardia, arrhythmia, family history of unexplained death or of prolongation of the QT interval, personal history of congenital or acquired prolongation of the QT interval or of unexplained syncope, severe electrolytic disorders, vitamin B1 deficiency.
– Do not administer to children under one year of age.
– Do not administer to patients who have received mefloquine in the previous 3 weeks (cardiotoxicity is more marked).
– May cause: prolongation of the QT interval, *torsades de pointes* and other serious ventricular arrhythmias, sometimes fatal; diarrhoea, abdominal pain, nausea , vomiting, skin rash.
– ECG monitoring is essential before giving treatment.
– Do not combine with drugs inducing *torsades de pointes*: anti-arrhythmics (quinidine, amiodarone, sotalol, etc.), neuroleptics (haloperidol, chlorpromazine), erythromycin IV, pentamidine; drugs inducing hypokalaemia (diuretics, glucocorticoids, amphotericin B, etc.), azole antifungals, most of protease inhibitors.
– *Pregnancy*: ***CONTRA-INDICATED***
– *Breast-feeding*: ***CONTRA-INDICATED***

Remarks
– Halofantrine should not be used for prophylaxis.
– Halofantrine is not included in the WHO list of essential medicines.
– *Storage: below 30°C –*
Once opened, oral suspension keeps for 15 days.

HALOPERIDOL
(Haldol®, Serenace®…)

Prescription under medical supervision

Therapeutic action
– Neuroleptic

Indications
– Acute psychoses: severe states of agitation or aggressiveness, delirium, acute mania
– Chronic psychoses: schizophrenic delirium, hallucinations
– Anxiety not controlled by anxiolytics

Presentation
– 2 mg and 5 mg tablets

Also comes in 1 mg and 20 mg tablets; 2 mg/ml and 20 mg/ml oral solution.

Dosage
– *Psychoses*
  • Child over 3 years: initial dose of 25 to 50 µg/kg/day in 2 to 3 divided doses
    If necessary, increase cautiously up to a maximum of 150 µg/kg/day.
  • Adult: 2 to 40 mg/day in 2 to 3 divided doses
    If necessary, increase gradually up to 40 mg/day according to clinical response.
– *Anxiety*
  • Adult: 1 mg/day in 2 divided doses

Duration
– *Psychoses:* according to clinical response
– *Anxiety:* short-term treatment

Contra-indications, adverse effects, precautions
– Do not administer to children under 3 years; to patients suffering from Parkinson's disease.
– In case of isolated hyperthermia (or associated with severe extrapyramidal disorders), stop treatment: possible neuroleptic malignant syndrome.
– May cause:
  • sedation or drowsiness, orthostatic hypotension;
  • extrapyramidal syndrome (requiring administration of anticholinergic antiparkinsonian drugs), early or tardive dyskinesia in case of prolonged treatment (may be exacerbated by antiparkinsonian drugs);
  • galactorrhoea, amenorrhoea, impotence.
– Administer with caution in hepatic or renal failure, to elderly patients, persons who drive or operate machinery, epileptics.
– Do not combine with levodopa.
– Risk of increased sedation when combined with alcohol and depressants of the central nervous system (hypnotics, anxiolytics, morphine and derivatives, antihistamines, etc.).
– Avoid alcohol during treatment.
– *Pregnancy: avoid*
– *Breast-feeding: avoid*

Remarks
– Haloperidol may induce more extrapyramidal reactions than chlorpromazine, but less often provokes sedation and orthostatic hypotension.
– *Storage:* no special temperature requirements –

HYDRALAZINE (Apresoline®…) and DIHYDRALAZINE (Nepressol®...)

Prescription under medical supervision

Therapeutic action

– Vasodilator antihypertensive drug

Indications

– Moderate or severe hypertension when thiazide diuretics or beta-blockers on their own are ineffective

Presentation

– 25 mg and 50 mg tablets

Dosage

– Adult: initial dose of 25 to 50 mg/day in 2 to 3 divided doses
– Increase the dose gradually over 2 weeks to the optimal dose of 100 mg/day in 2 to 3 divided doses.
– When hypertension is controlled, decrease the dose gradually. A hypertensive crisis may occur when treatment is discontinued abruptly.
– Do not exceed indicated doses. Maximum dose: 200 mg/day.

Duration: according to clinical response

Contra-indications, adverse effects, precautions

– Do not administer in coronary insufficiency or recent myocardial infarction.
– May cause: tachycardia reflex, headache.
– Administer with caution to elderly patients or those with history of cerebrovascular disease.
– *Pregnancy: avoid during the first trimester (safety is not established)*
– *Breast-feeding: no contra-indication*

Remarks

– Hydralazine and dihydralazine are used for the same indications at the same dosage.
– *Storage: below 30°C –*

HYDROCHLOROTHIAZIDE
(Esidrex®, HydroSaluric®…)

Prescription under medical supervision

Therapeutic action
– Diuretic

Indications
– Moderate or severe hypertension
– Oedema caused by renal, hepatic or congestive heart failure

Presentation
– 50 mg tablet
Also comes in 25 mg tablet.

Dosage
– *Hypertension*
  • Adult: 25 to 50 mg/day in 2 divided doses
– *Oedema*
  • Child: 1 mg/kg/day in 2 divided doses
  • Adult: 50 to 100 mg in the morning, on alternate days

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
Hypertension 50 mg tablet						1/4 to 1 tab x 2
Oedema 50 mg tablet				1/4 tab x 2		1 to 2 tab every 2 days

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Do not administer if severe renal failure, allergy to sulphonamides; for other types of oedema, especially those due to kwashiorkor.
– May cause: dehydration, hypotension, hypokalaemia, photosensitivity, hyperglycaemia.
– *Pregnancy:* **CONTRA-INDICATED**
– *Breast-feeding:* **CONTRA-INDICATED**

Remarks
– Often used in combination with an antihypertensive drug.
– A lot of fruit should be eaten during treatment (dates, bananas, mangos, oranges, etc.), in order to supply additional potassium. Use potassium tablets as well if available.
– *Storage:* no special temperature requirements –

HYOSCINE BUTYLBROMIDE = BUTYLSCOPOLAMINE (Buscopan®...)

Prescription under medical supervision

Therapeutic action
– Antispasmodic

Indications
– Spasms of the gastrointestinal tract and genitourinary tract

Presentation
– 10 mg tablet

Dosage
– Child from 6 to 12 years: 10 mg to be repeated up to 3 times per day if necessary
– Adult: 10 to 20 mg to be repeated up to 3 or 4 times per day if necessary

Duration: according to clinical response; no prolonged treatment.

Contra-indications, adverse effects, precautions
– Do not administer tablets to children under 6 years (use injectable hyoscine butylbromide).
– Do not administer to patients with urethro-prostatic disorders, cardiac disorders, glaucoma.
– Do not administer to children with high fever.
– May cause: urinary retention, dryness of the mouth, constipation, blurred vision, tachycardia.
– Administer with caution and under close supervision to patients taking other anticholinergic drugs (antidepressants, neuroleptics, H-1 antihistamines, antiparkinsonians, etc.).
– *Pregnancy: no contra-indication;* NO PROLONGED TREATMENT
– *Breast-feeding: no contra-indication;* NO PROLONGED TREATMENT

Remarks
– Other antispasmodics are used in certain countries:
  • atropine (child: 0.01 mg/kg every 4 to 6 hours, without exceeding 0.4 mg/day; adult: 0.4 to 0.6 mg every 4 to 6 hours),
  • propantheline (adult: 45 to 120 mg/day in 3 divided doses).
– Antispasmodic drugs are not included in the WHO list of essential medicines.
– *Storage: below 30°C* –

IBUPROFEN
(Advil®, Brufen®, Nureflex®…)

Prescription under medical supervision

Therapeutic action
– Analgesic, antipyretic, non-steroidal anti-inflammatory (NSAID)

Indications
– Mild to moderate pain
– Fever
– Rheumatic diseases

Presentation
– 200 mg and 400 mg enteric-coated tablets
– 100 mg/5 ml oral suspension, with pipette graduated per kg of body weight (each kg graduation corresponds to 10 mg ibuprofen)

Dosage
– *Mild to moderate pain, fever*
Child over 6 months: 30 mg/kg/day in 3 divided doses (= one pipette filled up to the graduation corresponding to the child's weight, 3 times per day)
Adult: 1200 to 1800 mg/day in 3 to 4 divided doses
In post-operative period, ibuprofen should be given on a regular basis, every 8 hours, rather than "as needed".

<table>
<tr><td>AGE</td><td>0</td><td colspan="2">6 months</td><td>6 years</td><td>15 years</td><td>ADULT</td></tr>
<tr><td>WEIGHT</td><td colspan="2">6 kg</td><td></td><td>20 kg</td><td>35 kg</td><td></td></tr>
<tr><td>100 mg/5 ml oral susp.</td><td rowspan="3">Do not administer</td><td colspan="2" rowspan="3">Use the graduated pipette for oral solution</td><td>–</td><td>–</td></tr>
<tr><td>200 mg tablet</td><td>1 to 2 tab x 3</td><td>2 tab x 3 or 4</td></tr>
<tr><td>400 mg tablet</td><td>–</td><td>1 tab x 3 or 4</td></tr>
</table>

– *Rheumatoid arthritis*
Child: up to 40 mg/kg/day maximum
Adult: up to 3200 mg/day maximum

Duration: according to clinical response; *post-operative pain*: 8 days maximum

Contra-indications, adverse effects, precautions
– Do not administer to children under 6 months.
– Do not administer to patients with allergy to NSAID, peptic ulcer, coagulation defects, haemorrhage, surgery with risk of major blood loss, severe renal or hepatic impairment, severe heart failure, severe malnutrition, uncorrected dehydration or hypovolaemia, severe infection.
– May cause: allergic reactions sometimes severe, epigastric pain, peptic ulcer, haemorrhage, renal impairment.
– Administer with caution to elderly or asthmatic patients.
– Do not combine with: methotrexate, anticoagulants and other NSAIDs.
– Monitor combination with diuretics and angiotensin-converting enzyme inhibitors (drink plenty of fluids to avoid renal failure).
– *Pregnancy: not recommended during the first five months.* ***CONTRA-INDICATED*** *from the beginning of the sixth month (use paracetamol)*
– *Breast-feeding: no contra-indication for short term treatment*

Remarks
– Take with meals.
– Clean the graduated pipette carefully after use. Shake the bottle well before use.
– If ibuprofen alone does not provide pain relief, combine with paracetamol and/or an opioid analgesic.
– *Storage: below 30°C* –  – 
Once opened, oral suspension must be stored between 8°C and 15°C.

INDINAVIR = IDV
(Crixivan®)

Prescription under medical supervision

Therapeutic action
– Antiretroviral, HIV-1 and HIV-2 protease inhibitor

Indications
– HIV-1 or HIV-2 infection, in combination with two nucleoside reverse transcriptase inhibitors and usually with a low-dose of ritonavir as booster

Presentation
– 200 mg, 333 mg and 400 mg capsules

Posologie
– *Administration of indinavir without ritonavir*
Child from 4 years: 1500 mg/m²/day in 3 divided doses, without exceeding 800 mg per dose
Adult: 2400 mg/day in 3 divided doses

Weight	200 mg capsule	400 mg capsule
10 to 14 kg	1 cap x 3	–
15 to 19 kg	2 cap x 3	1 cap x 3
20 to 24 kg	2 cap x 3	1 cap x 3
25 to 29 kg	2 cap x 3	1 cap x 3
30 to 49 kg	3 cap x 3	–
≥ 50 kg	4 cap x 3	2 cap x 3

– *Concomitant administration of indinavir + ritonavir*
Adult: 1600 mg/day of indinavir + 200 mg/day of ritonavir in 2 divided doses

Duration
– The duration of treatment depends on the efficacy and tolerance of indinavir.

Contra-indications, adverse effects, precautions
– May cause: gastrointestinal disturbances, rash, dry skin, myalgia, taste disturbances, headache, dizziness, urinary lithiasis (more frequent in children or when combined with ritonavir), hepatic disorders (raised transaminases or bilirubin), haematological disorders (neutropenia), metabolic disorders (lipodystrophy, hyperlipidaemia, diabetes mellitus with glucose intolerance and/or insulin resistance).
– Do not combine with rifampicin, phenobarbital and carbamazepine (reduced indinavir plasma concentration).
– When used concomitantly with oestrogen-progestogen oral contraceptives: increased risk of thromboembolism.
– Reduce dosage in patients with hepatic impairment (1800 mg/day).
– Administer with caution to patients with haemophilia (risk of haemorrhage).
– When patients receive indinavir and didanosine, administer first indinavir (as it requires acid for absorption), wait one hour, then administer didanosine.
– *Pregnancy: no contra-indication*
– *Breast-feeding: not recommended*

Remarks
– Take with plenty of water (200 ml). Drink at least 1.5 to 2 litres of water/day.
– Indinavir administered on its own (without ritonavir) must be taken 1 hour before or 2 hours after a meal.
– *Storage:* 

IODIZED OIL
(Lipiodol®)

Therapeutic action
– Iodine supplementation

Indications
– Prevention and treatment of severe iodine deficiency

Presentation
– 200 mg capsule

Dosage and duration
– Child under 1 year: 200 mg (1 capsule) once a year
– Child from 1 to 5 years: 400 mg (2 capsules) once a year
– Child from 6 to 15 years: 600 mg (3 capsules) once a year
– Pregnant woman or women of childbearing age: 400 mg (2 capsules) once a year

Contra-indications, adverse effects, precautions
– Do not administer to patients with allergy to iodine or hyperthyroidism.
– Do not administer to patients over 45 years.
– May cause: allergic reactions, dysthyroidism.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarques
– Also comes in 10 ml ampoule containing 480 mg/ml (Lipiodol® Ultra-Fluide) to be administered orally or by IM injection using a glass syringe:
  • children under 1 year: 0.5 ml
  • children from 1 to 15 years, pregnant women or women of childbearing age: 1 ml
– *Storage: below 30°C –* 

ISONIAZID = INH
(Laniazid®, Rimifon®…)

Prescription under medical supervision

Therapeutic action
– Antituberculous antibacterial

Indications
– Treatment of tuberculosis, *in combination with other antituberculous antibacterials*
– Prophylaxis of tuberculosis in newborn infants of M+ mothers and children < 5 years in close contact with a M+ patient

Presentation
– 100 mg and 300 mg tablets
Also comes in 50 mg/5 ml oral solution.

Dosage
– Newborn, child and adult: 5 mg/kg once daily, on an empty stomach; maximum 300 mg/day

Duration
– *Treatment*: according to protocol
– *Prophylaxis in children < 5 years*: 6 months
– *Prophylaxis in newborns*: 6 months then administer BCG vaccine, or alternatively, 3 months then perform a tuberculin skin test. If negative, discontinue isoniazid and administer BCG vaccine; if positive, continue isoniazid 3 more months then administer BCG vaccine.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe hepatic impairment.
– Administer with caution to patients with epilepsy, history of seizures or psychosis.
– May cause:
  • peripheral neuropathy, especially in malnourished, alcoholic, HIV-infected patients and patients with renal impairment.
  • hepatic disorders (jaundice), especially in alcoholic patients, patients receiving rifampicin, patients > 35 years; pregnant women including in post-partum period.
  • rarely: hypersensitivity reactions (fever, rash).
– If the patient presents symptoms of liver damage (jaundice), discontinue treatment until the symptoms resolve.
– Administer concomitantly pyridoxine (vitamin B6) in malnourished, alcoholic, HIV-infected patients and children < 5 years, to avoid peripheral neuropathy.
– *Pregnancy and breast-feeding: no contra-indication, administer pyridoxine concomitantly*

Remarks
– Isoniazid prophylaxis should be considered only after excluding active tuberculosis.
– For the treatment of tuberculosis, fixed dose combinations (isoniazid+rifampicin+pyrazinamide+ethambutol or isoniazid+rifampicin+pyrazinamide or isoniazid+rifampicin) should be preferred.
– *Storage: below 30°C –* 

ISOSORBIDE DINITRATE
(Isordil®, Risordan®, Sorbitrate®…)

Prescription under medical supervision

Therapeutic action
– Vasodilator, antianginal

Indications
– Prophylaxis and treatment of acute angina
– Adjunctive therapy in left congestive heart failure

Presentation
– 5 mg tablet

Dosage
– *Short-term prophylaxis of acute angina (sublingually)*
  Adult: 5 to 10 mg taken 10 minutes before a precipitating event (exercise, stress, etc.)
– *Long-term prophylaxis of angina and treatment of heart failure (orally)*
  Adult: 30 to 120 mg/day in 2 to 3 divided doses. Gradually increase the dose until effective. Do not stop treatment abruptly.
– *Treatment of acute angina (sublingually)*
  Adult: 5 to 10 mg, to be repeated after 10 minutes if necessary

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Do not administer to patients with obstructive cardiomyopathy, hypotension, shock.
– May cause: orthostatic hypotension (especially in elderly patients), headache, nausea, flushing of the face, haemolysis in patients with G6PD deficiency, severe hypotension with risk of circulatory collapse in the event of overdose.
– Use the lowest effective dose in patients taking another nitrate derivative, a vasodilator or an antihypertensive drug and in elderly patients.
– Combination with antihypertensive drugs, diuretics, vasodilators and alcohol enhances hypotensive effects.
– Do not combine with sildenafil (risk of acute coronary syndrome).
– *Pregnancy: not recommended (safety is not established)*
– *Breast-feeding: not recommended (safety is not established)*

Remarks
– Sublingual tablet must be crunched first, then slowly dissolved under the tongue. Oral tablet must be swallowed whole.
– By sublingual route, antianginal effect appears within less than 10 minutes and persists for 1 to 2 hours.
– Sustained-release formulations are used for the long-term management of angina and the treatment of congestive heart failure. The time interval between each administration depends on the preparations.
– *Storage: below 25°C* –  – 

ITRACONAZOLE
(Sporanox®…)

Prescription under medical supervision

Therapeutic action
– Antifungal

Indications
– Treatment of histoplasmosis and penicilliosis
– Secondary prophylaxis of histoplasmosis and penicilliosis

Presentation
– 100 mg capsule
– 10 mg/ml oral solution

Dosage and duration
– *Treatment of histoplasmosis*
  • moderate:
    Adult: 600 mg/day in 2 divided doses for 3 days then 400 mg/day in 2 divided doses for 12 weeks
  • severe, disseminated: same treatment, after 3-10 days' therapy with amphotericin B
– *Treatment of penicilliosis* (after 2 weeks' therapy with amphotericin B)
  Adult: 400 mg/day in 2 divided doses for 10 weeks
– *Secondary prophylaxis of histoplasmosis*
  Adult: 200 to 400 mg once daily, as long as necessary
– *Secondary prophylaxis of penicilliosis*
  Adult: 200 once daily, as long as necessary

Contra-indications, adverse effects, precautions
– Do not administer to patients with hypersensitivity to azole antifungals (fluconazole, ketoconazole, miconazole, etc.).
– May cause: gastrointestinal disturbances, headache, rash, anaphylactic reactions, heart failure, hepatitis; raised transaminases, hypokalaemia.
– Administer with caution to patients with heart failure (risk of pulmonary edema), hepatic or renal impairment.
– Stop treatment in the event of liver dysfunction.
– In case of prolonged treatment, monitor liver function.
– Do not combine with co-artemether or halofantrine (risk of torsades de pointe).
– Monitor combination with: oral anticoagulants (risk of haemorrhage), digoxine, buprenorphine, benzodiazepines, calcium inhibitors, ergometrine, (increased plasma concentration), phenytoin, carbamazepine, phenobarbital (efficacy of itraconazole reduced).
– Do not administer simultaneously with:
  • rifampicin: administer 12 hours apart (rifampicin in the morning, itraconazole in the evening),
  • didanosine, antacids and ulcer-healing drugs: wait 2 hours between the administration of itraconazole and these medications.
– *Pregnancy*: **CONTRA-INDICATED** *during the first trimester, except if vital and there is no therapeutic alternative*
– *Breast-feeding*: **CONTRA-INDICATED**

Remarks
– *Storage: below 30°C* –
  Once reconstituted, oral suspension keeps for 30 days.

IVERMECTIN
(Mectizan®, Stromectol®…)

Prescription under medical supervision

Therapeutic action
– Anthelminthic, scabicide

Indications
– Onchocerciasis
– Scabies

Presentation
– 3 mg and 6 mg tablets

Dosage and duration
– *Onchocerciasis*
Child over 15 kg and adult: 150 µg/kg as a single dose. A 2nd dose should be administered after 3 months if clinical signs persist. Repeat the treatment every 6 or 12 months to maintain the parasite load below the threshold at which clinical signs appear.

HEIGHT	**0**	**90 cm**	**120 cm**	**140 cm**	**160 cm**
WEIGHT		**15 kg**	**25 kg**	**45 kg**	**65 kg**
3 mg tablet	**Do not administer**	1 tab	2 tab	3 tab	4 tab
6 mg tablet		1/2 tab	1 tab	1 1/2 tab	2 tab

– *Ordinary scabies*
Child over 15 kg and adult: 200 µg/kg as a single dose. A single dose may be sufficient; a 2nd dose one week later reduces the risk of treatment failure.

– *Crusted scabies*
Child over 15 kg and adult: 2 doses of 200 µg/kg one week apart, in combination with a topical keratolytic and topical scabicide; additional doses may be necessary.

Contra-indications, adverse effects, precautions
– May cause:
  • increased itching;
  • moderate reactions in patients with onchocerciasis: ocular irritation, headache, arthralgia, myalgia, lymphadenopathy, fever, oedema;
  • severe reactions in patients co-infected with *Loa loa*: marked functional impairment if *Loa loa* microfilaraemia > 8,000 mf/ml; encephalopathy if *Loa loa* microfilaraemia > 30,000 mf/ml.
– Administer with caution in regions where loiasis is endemic:
  • *For symptomatic onchocerciasis*:
  Evaluate the severity of *Loa loa* microfilaraemia and manage accordingly: either treat as an out-patient under supervision, or hospitalise, or choose an alternative treatment (doxycycline).
  If it is not possible to perform a thick film examination: ivermectin may be administered if the patient has no history of loiasis (migration of an adult worm under the conjunctiva or transient « Calabar » swellings), nor history of severe adverse reactions following a previous treatment with ivermectin. In other cases, it is wiser either to treat under supervision, or to choose an alternative treatment (doxycycline), or decide not to treat, according to the severity of the onchocerciasis and the previous history.
  • *For ordinary scabies*: review the patient's history and if in doubt, topical scabicidal treatment is preferred.
– *Pregnancy: avoid (safety is not established)*
– *Breast-feeding: no contra-indication*

Remarks
– Take tablets on an empty stomach.
– Ivermectin is also used for the treatment of strongyloidiasis (200 µg/kg as a single dose) and cutaneous larva migrans (200 µg/kg daily for 1 to 2 days).
– *Storage: below 30°C* –

LACTULOSE
(Duphalac®…)

Therapeutic action
- Osmotic laxative

Indications
- Prevention of constipation in patients taking opioid analgesics (e.g. codeine, morphine)

Presentation
- 10 g/15 ml oral solution

Dosage and duration
- Child under 1 year: 5 ml/day (1 tsp/day)
- Child from 1 to 6 years: 5 to 10 ml/day (1 to 2 tsp/day)
- Child from 7 to 14 years: 10 to 15 ml/day (2 tsp/day or 1 ssp/day)
- Child over 14 years and adult: 15 to 45 ml/day (1 to 3 ssp/day)

Start lactulose when analgesic treatment continues more than 48 hours. Lactulose must be taken daily, until the end of the opioid treatment. Regular follow up (frequency/consistency of stools) is essential in order to adjust dosage correctly.

Contra-indications, adverse effects, precautions
- Do not administer to patients with Crohn's disease, ulcerative colitis, intestinal obstruction, undiagnosed abdominal pain.
- May cause: abdominal discomfort, flatulence and diarrhoea.
- In the event of diarrhoea, exclude a faecal impaction and intestinal obstruction; reduce the dose.
- *Pregnancy: no contra-indication*
- *Breast-feeding: no contra-indication*

Remarks
- It may take up to 48 hours, or even longer, before the treatment is effective. Lactulose is not indicated in acute constipation where a rapid result is needed.
- If necessary, lactulose may be given in combination with a stimulant laxative (e.g. bisacodyl, senna).
- The oral solution may be taken undiluted, or diluted in water.
- The treatment should be accompanied by dietary measures (fluids and fibre).
- *Storage: below 25°C. Do not store in a refrigerator (cristallisation).*

LAMIVUDINE = 3TC
(Epivir®, Lamivir®…)

Prescription under medical supervision

Therapeutic action
– Antiretroviral, HIV-1 and HIV-2 nucleoside reverse transcriptase inhibitor

Indications
– HIV-1 or HIV-2 infection, in combination with other antiretroviral drugs

Presentation
– 150 mg and 300 mg tablets
– 50 mg/5 ml oral solution

Dosage
– Child under 1 month: 4 mg/kg/day in 2 divided doses
– Child from 1 month to 12 years: 8 mg/kg/day in 2 divided doses
– Adult: 300 mg once daily or in 2 divided doses

Weight	10 mg/ml oral solution	150 mg tablet	300 mg tablet
5 to 9 kg	2.5 ml x 2	–	–
10 to 14 kg	5 ml x 2	–	–
15 to 19 kg	7 ml x 2	1/2 tab x 2	–
20 to 24 kg	9 ml x 2	1/2 tab x 2	–
25 to 29 kg	11 ml x 2	2 tab	1 tab
≥ 30 kg	–	2 tab	1 tab

Duration
– The duration of treatment depends on the efficacy and tolerance of lamivudine.

Contra-indications, adverse effects, precautions
– Administer with caution to patients with history of hepatic disorders.
– May cause: gastrointestinal disturbances (diarrhoea, nausea, vomiting, etc.) and possibly: haematological disorders, especially when combined with zidovudine (neutropenia, anaemia, thrombocytopenia), myopathy, hepatic or pancreatic disorders.
– Reduce dosage in patients with renal impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: not recommended*

Remarks
– For prophylactic treatment to reduce mother-to-child HIV transmission, check national recommendations.
– Also comes in fixed-dose combination tablets incorporating lamivudine-zidovudine (Combivir®), lamivudine-zidovudine-abacavir (Trizivir®) and lamivudine-stavudine-nevirapine (Triomune®, Triviro®).
– *Storage:*
  - *Tablets : below 30°C*
  - *Oral solution : below 25°C. Once opened, solution keeps for 30 days maximum.*

LEVODOPA + CARBIDOPA
(Sinemet®…)

Prescription under medical supervision

Therapeutic action
– Antiparkinson drug

Indications
– Parkinson's disease and extrapyramidal disorders except those induced by neuroleptics

Presentation
– 100 mg levodopa + 10 mg carbidopa tablet
– 250 mg levodopa + 25 mg carbidopa tablet

Dosage
– Adult:
  • Initial dose of levodopa: 50 to 125 mg once or twice daily immediately after meals. Increase in increments of 50 to 125 mg every day or on alternate days, to individual optimal dose.
  • Maintenance dose: 750 to 1500 mg/day in 3 to 4 divided doses, immediately after meals.
– Reduce dosage in elderly patients.

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Do not administer if severe psychosis, mental confusion, closed-angle glaucoma, recent myocardial infarction, malignant melanoma.
– May cause:
  • early in treatment, when dose is not adjusted : anorexia, vomiting, orthostatic hypotension, cardiac arrhythmia, agitation, insomnia or drowsiness, depression;
  • frequent delayed adverse effects, signs of excessive dosage, mainly:
    – dyskinesia, tremor;
    – psychiatric disorders more frequent in elderly patients: confusion, hallucinations, delirium, depression with or without suicidal tendencies;
  • later in treatment : fluctuation of the effect during the day (daily dosage may be divided into smaller doses and taken more frequently); or reduction of the effect (progression of the disease).
– Administer with caution in psychiatric disorders, cardiac disease, gastro-duodenal ulcer.
– Do not administer simultaneously with MAOIs, antidepressants, neuroleptics, reserpine.
– *Pregnancy*: **CONTRA-INDICATED**
– *Breast-feeding*: **CONTRA-INDICATED**

Remarks
– Tablet must be swallowed whole. Do not chew or dissolve.
– *Storage: below 30°C* –

LEVONORGESTREL
(Microlut®, Microval®, Norgeston®…)

Prescription under medical supervision

Therapeutic action
- Hormonal contraceptive, (low-dose)progestogen

Indications
- Oral contraception

Presentation
- 30 µg (0.03 mg) tablet, 28-day pack or 35-day pack

Dosage
- 1 tablet daily at the same time, continuously, including during menstruation
- Start:
  the first day of menstruation
  or immediately after abortion
  or after childbirth: as of the 21st day, if the woman does not breastfeed

Duration: if there are no adverse effects, as long as contraception is desired.

Contra-indications, adverse effects, precautions
- Do not administer to women with breast cancer, severe or recent liver disease, unexplained vaginal bleeding, current thromboembolic disorders.
- May cause: oligomenorrhoea, menstrual disturbances, nausea, weight gain, breast tenderness, mood changes, acne, headache.
- Hepatic enzyme inducers (rifampicin, rifabutin, nevirapine, nelfinavir, ritonavir, phenobarbital, phenytoin, carbamazepine, griseofulvin, etc.) reduce the contraceptive efficacy. Use copper intrauterine device or condoms or injectable medroxyprogesterone.
- *Pregnancy*: ***CONTRA-INDICATED***
- *Breast-feeding: it is recommended to wait 6 weeks after childbirth before starting levonorgestrel in breastfeeding women. However, if it is the only contraceptive method available or acceptable, it can be started 3 weeks after childbirth.*

Remarks
- Levonorgestrel is a possible alternative when estroprogestogens are contra-indicated or poorly tolerated. However, it has a lesser contraceptive effect than estroprogestogens and requires taking tablets at a precise time (no more than 3 hours late).
- In a woman misses a tablet, she should take it as soon as possible and continue treatment as normal. If she misses by over 3 hours, contraceptive protection will be lessened, it is therefore recommended to use an additional contraceptive method: condoms for 7 days and, if she has had sexual intercourse within 5 days before forgetting the tablet, emergency contraception.
- *Storage: below 30°C*

LEVONORGESTREL for emergency contraception (Norlevo®, Plan B®, Vikela®…)

Therapeutic action

– Hormonal contraceptive, progestogen

Indications

– Prevention of pregnancy in the event of a lapse or absence of contraception

Presentation

– 750 µg and 1.5 mg tablets

Dosage and duration

– One 1.5 mg tablet or two 750 µg tablets as a single dose, whatever the day of the cycle, as soon as possible after unprotected intercourse and preferably within the first 72 hours as effectiveness decreases with time. It is however recommended to administer the treatment up to 120 hours (5 days) after unprotected intercourse.

Contra-indications, adverse effects, precautions

– No contra-indication.
– May cause: vaginal bleeding within 7 days following administration, nausea.
– Re-administer treatment if vomiting occurs within 3 hours of taking treatment.
– In women taking enzyme-inducing drugs (rifampicin, rifabutin, griseofulvin, phenytoin, phenobarbital, carbamazepine, certain antiretrovirals), contraceptive effectiveness may be reduced: as a cautionary measure, double the dose (3 mg as a single dose). However, when prophylactic antiretroviral treatment is initiated together with emergency contraception, it is not necessary to double the dose of levonorgestrel.
– *Pregnancy: in the event of treatment failure (i.e. pregnancy develops) or if used during an undiagnosed pregnancy, there is no known harm for the foetus.*
– *Breast-feeding: no contra-indication*

Remarks

– Emergency contraception is intended to prevent pregnancy; it cannot terminate an ongoing pregnancy.
– There is a risk of treatment failure. Carry out a pregnancy test if there is no menstruation:
  • within 5 to 7 days after the expected date, if the date is known,
  • or within 21 days following treatment.
– *Storage: below 30°C*

LOPERAMIDE
(Imodium®…)

Prescription under medical supervision

Therapeutic action
– Opioid antidiarrhoeal

Indications
– Symptomatic treatment of persistent diarrhoea in HIV patients, in combination with rehydration

Presentation
– 2 mg capsule or tablet

Also comes in 1 mg/5 ml oral solution.

Dosage
– Child from 2 to 5 years: 3 mg/day in 3 divided doses
– Child from 6 to 8 years: 4 mg/day in 2 divided doses
– Child over 8 years: 6 mg/day in 3 divided doses

Age **Weight**	**0-2 years** **< 13 kg**	**2-5 years** **13 - 20 kg**	**6-8 years** **20 - 30 kg**	**> 8 years** **> 30 kg**
Oral solution	Do not administer	1 tsp x 3	2 tsp x 2	2 tsp x 3
Capsule		–	1 caps x 2	1 caps x 3

– Adult: 4 mg (2 capsules), then 2 mg (1 capsule) after each loose stool, without exceeding 16 mg/day (8 capsules/day)

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Do not exceed indicated doses.
– Do not administer to children under 2 years.
– Do not administer to patients with bloody diarrhoea, acute inflammatory bowel disease, diarrhoea due to antibiotics.
– May cause: constipation, allergic skin reactions, drowsiness, dizziness.
– In the event of overdosage, treat with naloxone.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Rehydration is essential and must be adapted to the severity of diarrhoea.
– Loperamide is not included in the WHO list of essential medicines.
– *Storage: below 30°C* –

LOPINAVIR/RITONAVIR = LPV/r
(Aluvia®, Kaletra®)

Prescription under medical supervision

Therapeutic action
– Antiretrovirals, HIV-1 and HIV-2 protease inhibitors

Indications
– HIV-1 or HIV-2 infection, in combination with other antiretroviral drugs

Presentation
– 100 mg lopinavir/25 mg ritonavir film coated tablet
– 200 mg lopinavir/50 mg ritonavir film coated tablet
– 80 mg lopinavir/20 mg ritonavir per ml oral solution, containing 42% alcohol (v/v), with a graduated syringe for oral administration

Dosage
– Child from 14 days to 6 months: 32/8 mg/kg/day in 2 divided doses
– Child over 6 months:
  • 7 to 15 kg: 24/6 mg/kg/day in 2 divided doses
  • 15 to 40 kg: 20/5 mg/kg/day in 2 divided doses
– Adult: 800/200 mg/day in 2 divided doses

Weight	80/20 mg/ml oral solution	100/25 mg tablet	200/50 mg tablet
< 4 kg	1 ml x 2	–	–
4 to 9 kg	1.5 ml x 2	–	–
10 to 13 kg	2 ml x 2	–	–
14 to 19 kg	2.5 ml x 2	–	–
20 to 25 kg	3 ml x 2	2 tab x 2	–
26 to 34 kg	–	3 tab x 2	–
> 35 kg	–	4 tab x 2	2 tab x 2

Duration: depending on the efficacy and tolerance of LPV/r.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe hepatic impairment.
– Do not administer oral solution to patients with renal or hepatic impairment.
– May cause:
  • gastrointestinal disturbances (mainly diarrhoea), skin rash, pruritus;
  • hepatic disorders (raised transaminases), pancreatic disorders, metabolic disorders (lipodystrophy, hyperlipidaemia, diabetes mellitus with glucose intolerance and/or insulin resistance).
– LPV/r may reduce the efficacy of oral contraceptives: use a non-hormonal contraception or injectable medroxyprogesterone or make sure that the oral contraceptive used contains 50 µg ethinylestradiol per tablet.
– Do not combine with rifampicin (use rifabutin).
– Administer with caution to patients with haemophilia (risk of haemorrhage) or renal or hepatic impairment.
– *Pregnancy: oral solution is* CONTRA-INDICATED

Remarks
– Tablets may be taken with meals or on an empty stomach. The oral solution must be taken with meals. If LPV/r oral solution is used concomitantly with didanosine, administer didanosine 1 hour before or 2 hours after LPV/r, as it must be taken on an empty stomach.
– The tablets must not be chewed or crushed.
– *Storage: tablets: below 30°C; oral solution: between 2°C and 8°C. If refrigeration is not available, oral solution kept below 25°C may be stored for 6 weeks maximum.*

MEBENDAZOLE
(Pantelmin®, Vermox®, Wormin®...)

Prescription under medical supervision

Therapeutic action
– Anthelminthic

Indications
– Ascariasis (*Ascaris lumbricoides*), trichuriasis (*Trichuris trichiura*), hookworm infections (*Ancylostoma duodenale*, *Necator americanus*), enterobiasis (*Enterobius vermicularis*), trichinellosis (*Trichinella spp*)

Presentation
– 100 mg and 500 mg tablets

Dosage and duration
– *Ascariasis, trichuriasis, hookworm infections*
  Child over 6 months and adult: 100 mg twice daily for 3 days
  Child over 6 months but under 10 kg: 50 mg twice daily for 3 days
– *Enterobiasis*
  Child over 6 months and adult: 100 mg as a single dose
  Child over 6 months but under 10 kg: 50 mg as a single dose
  A second dose may be given after 2 to 4 weeks.
– *Trichinellosis*
  Child over 2 years: 5 mg/kg/day in 2 divided doses for 10 to 15 days
  Adult: 400 mg/day in 2 divided doses for 10 to 15 days

Contra-indications, adverse effects, precautions
– Do not administer to children less than 6 months.
– May cause: gastrointestinal disturbances, headache, dizziness.
– *Pregnancy: avoid during the first trimester*
– *Breast-feeding: no contra-indication*

Remarks
– Albendazole is easier to use and is preferred in mixed infections as it has a broader spectrum of activity.
– Tablets are to be chewed or crushed: follow manufacturer's instructions.
– Take tablets between meals.
– *Storage:*  –

MEFLOQUINE = MQ
(Lariam…®)

Prescription under medical supervision

Therapeutic action
– Antimalarial

Indications
– Treatment of uncomplicated falciparum malaria, in combination with artesunate
– Prophylaxis of falciparum malaria for non-immune individuals

Presentation
– 250 mg mefloquine base scored tablet

Dosage and duration
– *Treatment of uncomplicated falciparum malaria*
Child over 3 months (or over 5 kg) and adult: 25 mg base/kg in 2 divided doses (15 mg base/kg followed by 10 mg base/kg 12 to 24 hours later)

Weight	1st day	2nd day
5 to 6 kg	1/4 tab	1/4 tab
7 to 10 kg	1/2 tab	1/4 tab
11 to 19 kg	1 tab	1/2 tab
20 to 24 kg	11/2 tab	1 tab
25 to 35 kg	2 tab	1 tab
36 to 50 kg	3 tab	2 tab
> 50 kg	4 tab	2 tab

– *Prophylaxis of falciparum malaria*
Child: 5 mg base/kg/week
Adult : 250 mg base/week
Travellers should start prophylaxis 2 weeks before departure, continue throughout the stay and for at least 3 weeks after return.

Contra-indications, adverse effects, precautions
– Do not administer to patients with history of neuropsychiatric disorders, seizures or hypersensitivity to mefloquine.
– Do not administer for prophylaxis in patients with severe hepatic impairment.
– May cause:
  • gastrointestinal disturbances, dizziness, headache (effects usually transitory when used for prophylaxis);
  • more rarely: neuropsychiatric reactions (more frequent with doses used for treatment than for prophylaxis), heart rhythm disorders, hypo or hypertension, skin allergies.
– If the patient vomits within one hour after administration: repeat the full dose.
– Do not combine with: sodium valproate, phenytoin, carbamazepine (risk of seizures), co-artemether, chloroquine, halofantrine (risk of seizures, cardiac toxicity).
– Do not administer simultaneously with quinine (risk of seizures, cardiac toxicity): if mefloquine is used after quinine IV, administer mefloquine 12 hours after the last dose of quinine.
– Administer with caution to patients taking antiarrhythmics, beta-blockers, calcium-channel blockers or digitalis (risk of heart rhythm disorders).
– *Pregnancy*: **CONTRA-INDICATED** *for the treatment of malaria during the first trimester*
– *Breast-feeding*: *avoid*

Remarks
– The combination artesunate-mefloquine (Artequin®) exists in co-blisters. The active ingredients are not combined in the same tablet but are presented in the same blister to facilitate compliance.
– Also comes in fixed dose combinations artesunate-mefloquine: 25 mg artesunate + 50 mg mefloquine tablets and 100 mg artesunate + 200 mg mefloquine tablets.
– *Storage: below 25°C* –  – 

METAMIZOLE = DIPYRONE = NORAMIDOPYRINE (Nolotil®, Novalgin®...)

Prescription under medical supervision

The use of this drug is not recommended:
- **it is potentially harmful;**
- **it has been taken off the market in many countries;**
- **it must never be prescribed as a first choice treatment.**

Therapeutic action
- Analgesic
- Antipyretic

Indications
- Severe pain
- High fever

Presentation
- 500 mg tablet

Dosage
- Child over 5 years: 250 mg to 1 g/day in 3 divided doses
- Adult: 500 mg to 3 g/day in 3 divided doses

Duration: according to clinical response, 1 to 3 days

Contra-indications, adverse effects, precautions
- Do not administer in case of gastric ulcer.
- Severe and fatal cases of agranulocytosis have been reported. Use only when usual antipyretics and analgesics (acetylsalicylic acid and paracetamol) have been ineffective.
- *Pregnancy: avoid*
- *Breast-feeding: avoid*

Remarks
- Metamizole is not included in the WHO list of essential drugs.
- *Storage:* no special temperature requirements

METHYLDOPA
(Aldomet®…)

Prescription under medical supervision

Therapeutic action
– Centrally acting antihypertensive

Indications
– Hypertension in pregnancy

Presentation
– 250 mg tablet

Dosage
– Initially 500 to 750 mg/day in 2 to 3 divided doses for 2 days, then increase gradually if necessary by 250 mg every 2 to 3 days, until the optimal dose is reached, usually 1,5 g/day. Do not exceed 3 g/day.

Duration
– According to clinical response. Do not stop treatment abruptly; reduce doses gradually.

Contra-indications, adverse effects, precautions
– Do not administer to patients with active liver disease, history of drug-related liver disease, severe depression.
– Administer with caution to patients with hepatic impairment, and reduce doses in patients with renal impairment.
– May cause:
  • orthostatic hypotension, drowsiness, headache, gastrointestinal disturbances, dry mouth,
  • rarely: haematological, hepatic, psychical disorders; allergic reactions.
– Stop treatment if haemolytic anaemia or jaundice appear during treatment.
– In the event of unexplained fever during treatment, check blood count and transaminases for possible hepatitis due to methyldopa.
– Monitor combination with lithium (risk of lithium overdose), antidepressants (enhanced hypotensive effect), CNS depressants (increased sedation).
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– *Storage: below 30°C*

METOCLOPRAMIDE
(Primperan®…)

Prescription under medical supervision

Therapeutic action
– Anti-emetic

Indications
– Symptomatic treatment of nausea and vomiting
– Gastro-oesophageal reflux

Presentation
– 10 mg tablet

Also comes in 5 mg and 15 mg tablets, 0.1 mg/drop oral solution for paediatric use and 1 mg/ml syrup for adults only.

Dosage
– *Nausea and vomiting*

Child:

Age	Weight	Daily dose	10 mg tablet	Oral solution 0.1 mg/drop
Under 1 year	Under 10 kg	1 mg x 2	–	10 drops x 2
1 to 3 years	10 to 14 kg	1 mg x 2 to 3	–	10 drops x 2 to 3
3 to 5 years	15 to 19 kg	2 mg x 2 to 3	1/4 tab x 2 to 3	20 drops x 2 to 3
5 to 9 years	20 to 29 kg	2.5 mg x 3	1/4 tab x 3	–
9 to 14 years	30 kg and over	5 mg x 3	1/2 tab x 3	–

Adult: 10 mg every 6 to 8 hours if necessary

– *Gastro-oesophageal reflux*

Adult: 40 mg/day in 4 divided doses, 30 minutes before meals and at bedtime

Duration: according to clinical response, as short as possible

Contra-indications, adverse effects, precautions
– Do not administer to patients with gastrointestinal haemorrhage, obstruction or perforation, seizures.
– May cause:
  • drowsiness, headache,
  • rarely, extrapyramidal disorders (dyskinesia, tremor) especially in children and young patients,
  • increased frequency of seizures in epileptics,
  • worsening of Parkinson disease,
  • hyperprolactinemia in the event of prolonged treatment.
– Do not combine with levodopa.
– Avoid combination with antispasmodics (hyoscine butylbromide, atropine propantheline) and neuroleptics.
– Avoid alcohol during treatment.
– Reduce doses if renal or hepatic impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: avoid. If clearly needed, do not exceed a treatment period of 7 days.*

Remarks
– *Storage:*
  • *Tablet and syrup: below 30°C*
  • *Oral solution for paediatric use: below 25°C*

METRONIDAZOLE
(Flagyl®…)

Prescription under medical supervision

Therapeutic action

– Antiprotozoal, antibacterial (group of nitroimidazoles)

Indications

– Amoebiasis, giardiasis, trichomoniasis
– Bacterial vaginitis, infections due to anaerobic bacteria (e.g. *Clostridium* sp, *Bacteroides* sp, etc.)

Presentation

– 200 mg, 250 mg, 400 mg and 500 mg tablets
– 125 mg/5 ml and 200 mg/5 ml oral suspensions

Dosage and duration

– *Amoebiasis*
  Child: 45 mg/kg/day in 3 divided doses
  Adult: 500 to 800 mg 3 times daily
  The treatment lasts 5 days in intestinal amoebiasis and 5 to 10 days in hepatic amoebiasis.
– *Giardiasis*
  Child: 30 mg/kg once daily for 3 days
  Adult: 2 g once daily for 3 days
– *Trichomoniasis* and *bacterial vaginitis*
  Adult: 2 g as a single dose
  In the event of trichomoniasis, also treat sexual partner.
– *Infections due to anaerobic bacteria*
  Child: 30 mg/kg/day in 3 divided doses
  Adult: 500 mg 3 times daily
  According to indication, metronidazole may be used in combination with other antibacterials; treatment duration depends on indication.

Contra-indications, adverse effects, precautions

– Do not administer to patients with hypersensitivity to metronidazole or another nitroimidazole (tinidazole, secnidazole, etc.).
– May cause: gastrointestinal disturbances; rarely: allergic reactions, brownish urine, headache, dizziness. Risk of antabuse reaction when combined with alcohol.
– Administer with caution in patients taking oral anticoagulants (risk of haemorrhage), lithium, phenytoin, ergometrine (increased plasma concentrations of these drugs).
– Reduce total daily dose to 1/3 and give once daily to patients with severe hepatic impairment.
– *Pregnancy: no contra-indication; divide into smaller doses, avoid prolonged use.*
– *Breast-feeding: significantly excreted in milk (risk of gastrointestinal disturbances in breastfed infants); divide into smaller doses, avoid prolonged use.*

Remarks

– *Storage: below 30°C –* 
  Once the bottle has been opened, oral suspension keeps 15 days maximum.

MIFEPRISTONE = RU486

Prescription under medical supervision

Therapeutic action

– Antiprogestogen

Indications

– Termination of intra-uterine pregnancy, in combination with misoprostol (or another prostaglandin)
– Cervical dilatation before aspiration or curettage
– Induction of labour in the event of intrauterine foetal death

Presentation

– 200 mg tablet

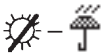
Dosage and duration

– *Termination of pregnancy (first and second trimester)*
  200 mg or 600 mg as a single dose, followed by a dose of misoprostol 36 to 48 hours later
– *Cervical dilatation before aspiration or curettage*
  200 mg as a single dose, 36 to 48 hours before aspiration or curettage
– *Induction of labour in the event of intrauterine foetal death*
  600 mg once daily for 2 days

Contra-indications, adverse effects, precautions

– Do not administer to patients with chronic adrenal failure or severe uncontrolled asthma.
– May cause: gastrointestinal disturbances, vaginal bleeding, uterine contractions, headache, dizziness.
– The efficacy of mifepristone may be reduced in women taking rifampicin, phenytoin, phenobarbital and carbamazepine.
– *Breast-feeding: avoid*

Remarks

– Mifepristone is administered by oral route only.
– When used for termination of pregnancy, check for complete uterine emptying after treatment.
– For labour induction in the event of intrauterine foetal death, mifepristone is administered as the first line treatment. It may be sufficient to initiate labour, but it is often necessary to administer misoprostol (or another prostaglandin) if labour is not established within 36 to 48 hours of the 2nd dose of mifepristone.
– Mifepristone cannot terminate an ectopic pregnancy and has no role in the management of ectopic pregnancy.
– *Storage: below 30°C* –  –

MISOPROSTOL

Prescription under medical supervision

Therapeutic action
– Cervical ripening agent, oxytocic drug (prostaglandin)

Indications
– Induction of labour when continuation of pregnancy is dangerous for mother and/or foetus and the cervix is not favourable, especially in the event of intrauterine foetal death or severe pre-eclampsia
– Cervical dilatation before aspiration or curettage
– Treatment of post-partum haemorrhage due to uterine atony, when injectable oxytocics are not available or ineffective
– Termination of intra-uterine pregnancy, in combination with mifepristone
– Incomplete abortion in the first trimester.

Presentation
– 200 µg tablet

Dosage and duration
– *Induction of labour*
  • intrauterine foetal death: 200 µg (in the 2nd trimester) or 100 µg (in the 3rd trimester) vaginally, every 4 to 6 hours until labour occurs, up to a maximum of 3 doses per 24 hours, to be repeated the following day, if necessary
  • viable pregnancy: 25 µg vaginally, every 4 to 6 hours until labour occurs, up to a maximum of 6 doses or 150 µg
– *Cervical dilatation before aspiration or curettage*
  400 µg vaginally as a single dose, 3 hours before procedure
– *Treatment of post-partum haemorrhage*
  1000 µg rectally as a single dose
– *Termination of pregnancy (first and second trimester)*
  36 to 48 hours after the administration of mifepristone, administer misoprostol: 400 µg orally or vaginally, to be repeated every 3 hours, up to a maximum of 5 doses
– I*ncomplete abortion in the first trimester*
  600 µg orally as a single dose

Contra-indications, adverse effects, precautions
– During the 2nd and the 3rd trimester:
  • Do not administer in the event of malpresentation, true cephalo-pelvic disproportion, complete placenta praevia.
  • In the event of history of caesarean section or grand multiparity:
    - If the foetus is viable: a caesarean section is indicated, do not administer misoprostol (risk of uterine rupture);
    - If the foetus is dead or non-viable, or viable but a caesarean section cannot be performed: reduce the dose by half (risk of uterine rupture).
– For labour induction:
  • Do not administer simultaneously with oxytocin. At least 6 hours must have elapsed since the last administration of misoprostol before oxytocin can be given.
  • Regular monitoring of the intensity and frequency of contractions is mandatory.
  • If the foetus is viable, continuous foetal heart monitoring is mandatory for 30 minutes after administration of each dose of misoprostol and once contractions are experienced or detected.
– May cause: gastrointestinal disorders, headache, dizziness, fever, chills, uterine hypertonia, uterine rupture, foetal distress.
– If the woman vomits within 30 minutes of oral administration, administer the same dose vaginally.
– *Breast-feeding: no contra-indication*

Remarks
– When the cervix is favourable, induce labour through administration of oxytocin and artificial rupture of the membranes.
– When used for termination of pregnancy, check for complete uterine emptying after treatment.
– *Storage: below 30° C*

MORPHINE immediate-release (MIR) (Sevredol®…)

Prescription under medical supervision

Therapeutic action
– Centrally acting opioid analgesic

Indications
– Severe pain

Presentation
– 10 mg immediate-release tablet
Also comes in 2 mg/ml oral solution for paediatric use.

Dosage
There is no standard dose. The optimal dose is that which provides efficient pain relief to the patient. It is adjusted in relation to the regular assessment of pain intensity and the incidence of adverse effects.
– Day 1:
  • Start with a scheduled treatment (scheduled doses):
    Child over 6 months: 1 mg/kg/day in 6 divided doses at 4-hour intervals
    Adult: 60 mg/day in 6 divided doses at 4-hour intervals
  • Adjust the treatment if pain persists by administering "rescue" doses between the scheduled doses. The rescue doses administered are the same as the scheduled doses.
– Then, adjust scheduled treatment every 24 hours according to the total dose given the day before (i.e. total scheduled doses + total rescue doses).

For example, Day 1, for a dose of 60 mg/day, i.e. 10 mg every 4 hours:

Hours	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7
Scheduled doses	10 mg				10 mg				10 mg				10 mg				10 mg				10 mg			
Example simple verbal scale	severe pain		moderate pain		mild pain		moderate pain		mild pain		mild pain		mild pain		moderate pain		mild pain				mild pain			
Example rescue doses			10 mg				10 mg								10 mg									

In this example, the scheduled treatment on Day 2 is 90 mg/day, i.e. 60 mg (total scheduled doses on Day 1) + 30 mg (total rescue doses on Day 1) in 6 divided doses, i.e. 15 mg every 4 hours.
– Scheduled doses must be administered at regular time intervals and not on demand, even at night, unless the patient is abnormally drowsy (in this event, delay the administration).
– Reduce the dose by half in elderly patients and patients with renal or hepatic impairment.

Duration: once the pain is controlled, change to sustained-release morphine.

Contra-indications, adverse effects, precautions
– See sustained-release oral morphine (MSR).

Remarks
– Administer an appropriate laxative (e.g. lactulose) if analgesic treatment continues more than 48 hours.
– The morphine dose in tablets is not suitable for young children. Use oral solution instead. If this is not available, use injectable morphine by the oral route: dilute an ampoule of 10 mg/ml (1 ml) with 9 ml of water to obtain a solution containing 1 mg/ml.
– Morphine is on the list of narcotics: follow national regulations.
– *Storage: below 25°C* –

MORPHINE sustained-release (MSR) (Kapanol® …)

Prescription under medical supervision

Therapeutic action

– Centrally acting opioid analgesic

Indications

– Severe and persistent pain, especially cancer pain

Presentation

– 10 mg, 30 mg and 60 mg sustained-release capsules or tablets

Dosage

– Usually, the effective daily dose is determined during the initial treatment with immediate-release morphine (MIR). When changing from MIR to MSR, the daily dose remains the same. For example, if the effective dose of MIR is 20 mg 6 times/day (120 mg/day), the dose of MSR is 60 mg 2 times/day (120 mg/day).
– If treatment is initiated directly with MSR:
  • Child over 6 months: initially 1 mg/kg/day in 2 divided doses at 12-hour intervals
  • Adult: initially 60 mg/day in 2 divided doses at 12-hour intervals

  Adjust the dose if necessary, increasing the dose by 50% per day until pain relief is obtained.
– Patients stabilized on MSR may require rescue doses of MIR in the event of episodic (breakthrough) pain. A rescue dose corresponds to 10% of the daily MSR dose. If a patient regularly requires more than 3 rescue doses per day, increase the daily MSR dose by the sum of rescue doses.

Duration

– According to clinical response. Do not stop long-term treatment abruptly. Decrease doses progressively to avoid withdrawal symptoms.

Contra-indications, adverse effects, precautions

– Do not administer to patients with severe respiratory impairment or decompensated hepatic impairment.
– Do not initiate treatment with the sustained-release formulation in elderly patients or those with renal or hepatic impairment. Begin treatment with the immediate release formulation (MIR).
– May cause:
  • dose-related sedation and respiratory depression, nausea, vomiting, constipation, urinary retention, confusion, raised intracranial pressure, pruritus;
  • in the event of overdose: excessive sedation, respiratory depression, coma.
– Management of respiratory depression includes assisted ventilation and/or administration of naloxone. Monitor patient closely for several hours.
– Administer with caution to patients with respiratory impairment, head injury, raised intracranial pressure, uncontrolled epilepsy or urethroprostatic disorders.

– Do not combine with opioid analgesics with mixed agonist-antagonist activity such as buprenorphine, nalbuphine, pentazocine (competitive action).
– Increased risk of sedation and respiratory depression, when combined with alcohol and drugs acting on the central nervous system: benzodiazepines (diazepam, etc.), neuroleptics (chlorpromazine, haloperidol, etc.), antihistamines (chlorphenamine, promethazine), phenobarbital, etc.
– *Pregnancy and breast-feeding: no contra-indication. The child may develop withdrawal symptoms, respiratory depression and drowsiness when the mother receives morphine at the end of the 3rd trimester and during breast-feeding. In these situations, administer with caution, for a short period, at the lowest effective dose, and monitor the child.*

Remarks

– Administer an appropriate laxative (e.g. lactulose) if analgesic treatment continues more than 48 hours.
– Do not crush or chew capsules. They can be opened and emptied into food.
– Morphine is on the list of narcotics: follow national regulations.
– *Storage: below 25°C* –  – 

MULTIVITAMINS – VITAMIN B COMPLEX

Therapeutic action

– Vitamin supplementation

Indications

– Few indications: this drug has no effect in case of real vitamin deficiency. Nevertheless, vitamin supplementation helps to prevent some deficiencies in people at risk (e.g. pregnant women).

Presentation

– Tablet. Composition varies in quality and quantity, with manufacturers.
Examples of composition per tablet:

	Multivitamins	B complex	Daily needs (adult)
Vitamin A	2500 IU	/	2500 IU
Vitamin B1	1 mg	1 mg	0.9 to 1.3 mg
Vitamin B2	0.5 mg	1 mg	1.5 to 1.8 mg
Vitamin B3 (= PP)	7.5 mg	15 mg	15 to 20 mg
Vitamin C	15 mg	/	10 mg
Vitamin D3	300 IU	/	100 to 200 IU

Dosage

– Child under 5 years: 1 tab/day
– Child over 5 years: 2 tab/day
– Adult: 3 tab/day

Duration: depending on situation

Contra-indications, adverse effects, precautions

– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Specific vitamin deficiency states require appropriate doses of vitamins.
– Multivitamins are not included in the WHO list of essential medicines.
– *Storage: keep in a cool place (8°C to 15°C) –* 

NALIDIXIC ACID
(Negram®…)

Prescription under medical supervision

The WHO no longer recommends the use of nalidixic acid for the treatment of shigellosis, even in areas where it is still effective.

Therapeutic action
- Antibacterial (group of quinolones)

Indications
- Acute uncomplicated cystitis, without fever or lumbar pain

Presentation
- 500 mg tablet

Dosage and duration
- Child over 3 months: 30 to 50 mg/kg/day in 4 divided doses for 7 days
- Adult: 4 g/day in 4 divided doses for 7 days

Contra-indications, adverse effects, precautions
- Do not administer to patients with severe renal impairment, history of convulsions, G6PD deficiency.
- May cause: gastrointestinal disturbances, allergic reactions, photosensitivity, neurological disorders (headache, dizziness, visual disturbances).
- Administer with caution and reduce doses in patients with hepatic or renal impairment.
- *Pregnancy*: CONTRA-INDICATED
- *Breast-feeding*: CONTRA-INDICATED

Remarks
- Due to its efficacy, safety and ease of administration, ciprofloxacin is the first-line antibiotic for shigellosis and cystitis.
- Once resistant to nalidixic acid, bacteria become very easily resistant to other quinolones (ciprofloxacin, etc.).
- Nalidixic acid is not included in the WHO list of essential medicines.
- Storage: below 30°C
- *Storage: below 30°C*

NEVIRAPINE = NVP
(Neravir®, Nevimune®,Viramune®…)

Prescription under medical supervision

Therapeutic action
– Antiretroviral, HIV-1 non nucleoside reverse transcriptase inhibitor

Indications
– HIV-1 infection, in combination with other antiretroviral drugs

Presentation
– 200 mg tablet
– 50 mg/5 ml oral suspension

Dosage
– Child from 2 months to 8 years: 4 mg/kg once daily for 14 days, then 14 mg/kg/day in 2 divided doses from the 15th day
– Child over 8 years: 4 mg/kg once daily for 14 days, then 8 mg/kg/day in 2 divided doses from the 15th day, without exceeding 400 mg/day
– Adult: 200 mg once daily for 14 days, then 400 mg/day in 2 divided doses from the 15th day

Weight	10 mg/ml oral suspension		200 mg tablet	
	Initial	Maintenance	Initial	Maintenance
5 to 9 kg	3 ml	6 ml x 2	Use oral suspension	–
10 to 14 kg	5 ml	10 ml x 2		1/2 tab x 2
15 to 19 kg	7 ml	14 ml x 2	1/2 tab	1 tab AM and 1/2 tab PM
20 to 24 kg	10 ml	< 8 years: 16 ml x 2	1/2 tab	< 8 years: 1 tab AM and 1/2 tab PM
		> 8 years: 10 ml x 2		> 8 years: 1/2 tab x 2
25 to 29 kg	12 ml	< 8 years: 20 ml x 2	1/2 tab	< 8 years: 1 tab x 2
		> 8 years: 12 ml x 2		> 8 years: 1/2 tab x 2
30 to 39 kg	14 ml	14 ml x 2	1 tab	1 tab AM and 1/2 tab PM
40 to 49 kg	–	–	1 tab	1 tab x 2
≥ 50 kg	–	–	1 tab	1 tab x 2

Duration: the duration of treatment depends on the efficacy and tolerance of nevirapine.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe hepatic impairment, history of severe intolerance to nevirapine that led to permanent discontinuation of treatment.
– May cause:
  • cutaneous reactions sometimes severe (Lyell's and Stevens-Johnson syndromes), hepatic disorders possibly severe (fulminant hepatitis). In these cases, stop taking nevirapine immediately and permanently.
  • gastrointestinal disturbances, headache, myalgia.
– Nevirapine reduces the efficacy of oestrogen-progestogen oral contraceptives: offer an alternative or make sure that there is > 20 µg ethinylestradiol per tablet.
– Avoid combination with rifampicin (decreases the efficacy of nevirapine). If the administration of rifampicin is required, use efavirenz rather than nevirapine.
– Monitor liver enzyme level (ALAT) during the first 2 months, then every 3 to 6 months. If the enzyme level reaches 5 times the normal level, stop nevirapine immediately.
– *Pregnancy: no contra-indication*
– *Breast-feeding: not recommended*

Remarks
– For prophylactic treatment to reduce mother-to-child transmission, check national recommendations.
– To improve tolerance, respect the initial 14-day phase of treatment. In the event of restarting treatment after having stopped for more than 7 days, recommence initial 14-day phase.
– Tablets are not scored. When half a tablet is required, use a cutter to cut the tablet into two equal parts.
– Also comes in fixed-dose combination tablets incorporating nevirapine-lamivudine-stavudine (Triomune®, Triviro®…).
– *Storage: below 30°C*
Once opened, oral suspension keeps for 2 months maximum.

NICLOSAMIDE
(Tredemine®, Yomesan®…)

Therapeutic action
– Anthelminthic (taenicide)

Indications
– Taeniasis: beef tapeworm (*Taenia saginata*), pork tapeworm (*Taenia solium*), dwarf tapeworm (*Hymenolepis nana*) and fish tapeworm (*Diphyllobothrium latum*)

Presentation
– 500 mg chewable tablet

Dosage and duration
– *T. saginata*, *T. solium* and *D. latum*
  Child under 2 years: 500 mg as a single dose
  Child from 2 to 6 years: 1 g as a single dose
  Child over 6 years and adult: 2 g as a single dose
– *H. nana*
  Child under 2 years: 500 mg on the first day, then 250 mg/day for 6 days
  Child from 2 to 6 years: 1 g on the first day, then 500 mg/day for 6 days
  Child over 6 years and adult: 2 g on the first day, then 1 g/day for 6 days

Contra-indications, adverse effects, precautions
– May cause: gastrointestinal disturbances.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Chew or crush the tablets before swallowing and washing down with water.
– In the event of vomiting, the single dose may be divided in 2 doses taken with an interval of one hour.
– As niclosamide is a taenicide, do not expect the patient to expel the worm, portions are voided in a partially digested form.
– Niclosamide is not active against the larval form of *T. solium* (cysticercosis).
– *Storage: below 25°C* – 

NICOTINAMIDE = VITAMIN PP = VITAMIN B3

Therapeutic action
– Vitamin

Indications
– Treatment of pellagra

Presentation
– 50 mg tablet
Also comes in 100 mg tablet.

Dosage
– Child: 100 to 300 mg/day in 2 to 3 divided doses
– Adult: 300 to 500 mg/day in 2 to 3 divided doses

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– *Pregnancy and breast-feeding: avoid, except if clearly needed (safety is not established)*

Remarks
– Nicotinamide is also called niacinamide.
– Vitamin PP deficiency is common when diet is almost entirely based on sorghum, millet or maize.
– Vitamin PP deficiency often occurs in association with other vitamin B-complex deficiency (thiamine, pyridoxine), especially in alcoholic patients.
– Vitamin PP is usually one of the components of multivitamin preparations and B-complex (7.5 mg to 15 mg/tablet).
– Nicotinic acid has a similar action to nicotinamide, but is no longer used because of its adverse effects, especially its vasodilator action.
– *Storage:* 

NIFEDIPINE
(Adalat®, Adalat®LA…)

Prescription under medical supervision

Therapeutic action
- Uterine relaxant
- Antihypertensive drug (calcium channel blocker)

Indications
- Threatened premature labour
- Hypertension

Presentation
- 10 mg short-acting (liquid-filled) capsule
- 10 mg prolonged-release tablet
  Also comes in 20 mg, 30 mg, 60 mg and 90 mg prolonged-release tablets to be administered once daily or to be administered twice daily. Follow manufacturer's instructions.

Dosage
- *Threatened premature labour* (short-acting capsule)
  10 mg by oral route, to be repeated every 15 minutes if uterine contractions persist (maximum 4 doses or 40 mg), then 20 mg by oral route every 6 hours
- *Hypertension* (prolonged-release tablets)
  20 to 100 mg/day in 2 divided doses or 20 to 90 mg once daily depending on the preparation used

Duration
- *Threatened premature labour*: 48 hours
- *Hypertension*: lifetime treatment

Contra-indications, adverse effects, precautions
- Do not administer to patients with severe cardiac disease (recent myocardial infarction, unstable angina).
- Do not administer if systolic blood pressure is below 90 mmHg.
- May cause:
  - headache, flushing, peripheral oedema (common adverse effects at the start of treatment);
  - dizziness, hypotension, tachycardia, nausea, gingival hyperplasia, rash.
- Stop nifedipine if ischaemic chest pain occurs or existing pain increases shortly after starting treatment.
- Do not combine with magnesium sulphate, salbutamol IV, and calcium channel blockers.
- Monitor combination with cimetidine (additive hypotension), phenytoin (risk of phenytoin toxicity), rifampicin (efficacy of nifedipine diminished), itraconazole (increased risk of oedema), beta-blockers (enhanced antihypertensive effects).
- *Pregnancy: CONTRA-INDICATED during the 1st trimester. Never administer sublingually (risk of foetal death from placental hypoperfusion).*
- *Breast-feeding: avoid*

Remarks
- Methyldopa and beta-blockers are the drugs of choice for treating hypertension in pregnancy.
- Short-acting formulations of nifedipine should not be used in hypertension since their use may cause excessive fall in blood pressure and cerebral or myocardial ischaemia.
- Prolonged-release tablets must be swallowed whole.
- *Storage: below 30°C –*

NITROFURANTOIN
(Furadantin®…)

Prescription under medical supervision

Therapeutic action

– Antibacterial (group of nitrofuranes)

Indications

– Uncomplicated cystitis, without fever or lumbar pain

Presentation

– 100 mg tablet

Also comes in 50 mg tablet or capsule and 25 mg/5 ml oral solution.

Dosage and duration

– Child over 3 months: 3 to 5 mg/kg/day in 3 divided doses for 5 to 7 days
– Adult: 300 mg/day in 3 divided doses for 5 to 7 days

AGE	**0**	**3 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
50 mg tablet	**Do not administer**	1/4 tab x 3	1/4 to 1/2 tab x 3	1/2 to 1 tab x 3	2 tab x 3	
100 mg tablet		–	–	1/4 to 1/2 tab x 3	1 tab x 3	

Contra-indications, adverse effects, precautions

– Do not administer to patients with renal impairment, allergy to nitrofurantoin.
– May cause: nausea, vomiting, allergic reactions; haemolytic anaemia in patients with G6PD deficiency.
– Do not administer simultaneously with antacids, administer 2 hours apart.
– *Pregnancy: CONTRA-INDICATED during the last month of pregnancy (risk of haemolysis in newborn)*
– *Breast-feeding: avoid during the first month*

Remarks

– Take during meals.
– *Storage: below 25°C*

NYSTATIN
(Mycostatin®, Nystan®…)

Prescription under medical supervision

Therapeutic action
– Antifungal

Indications
– Oropharyngeal, oesophageal and intestinal candidiasis

Presentation
– 100 000 IU lozenge
– 100 000 IU and 500 000 IU film coated tablets
– 100 000 IU/ml oral suspension

Dosage and duration
– *Oropharyngeal candidiasis*
  Child and adult: 400 000 IU/day in 4 divided doses between meals for 7 days. The lozenge should be sucked. For children, use the oral suspension or crush lozenges and apply to the affected area.
  It may be necessary to increase the dose to 2 000 000 IU/day in immunocompromised patients.
– *Oesophageal and intestinal candidiasis*
  Child: 400 000 IU/day in 4 divided doses between meals for 20 days
  Adult: 2 000 000 IU/day in 4 divided doses between meals for 20 days

Contra-indications, adverse effects, precautions
– The drug is well tolerated.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Film coated tablets used for the treatment of oesophageal and intestinal candidiasis are meant to be swallowed. They may be sucked when used for oropharyngeal candidiasis.
– Vaginal tablets may be used for the treatment of oropharyngeal candidiasis, in spite of their disagreeable taste.
– In immunocompetent patients, oropharyngeal candidiasis may also be treated by applying gentian violet.
– In immunocompromised patients:
  • For *oropharyngeal candidiasis*: by preference use miconazole muco-adhesive tablets or clotrimazole lozenge.
  • For *oesophageal candidiasis*: use fluconazole.
– *Storage: below 25°C* –  – 
  Once the vial has been opened, oral suspension keeps 7 days.

OMEPRAZOLE
(Mopral®…)

Prescription under medical supervision

Therapeutic action
– Antiulcer drug (proton pump inhibitor)

Indications
– Gastro-oesophageal reflux
– Benign peptic ulcer
– Complicated peptic ulcer (perforation, haemorrhage), for healing and preventing recurrence, in combination with 2 antibacterial drugs to eradicate *Helicobacter pylori*

Presentation
– 10 mg and 20 mg capsules

Dosage and duration
Adult:

– *Gastro-oesophageal reflux*
  • Short-term relief of symptoms: 20 mg once daily in the morning for 3 days
  • Treatment of gastro-oesophageal reflux disease: 20 mg once daily in the morning for 4 weeks (up to 8 weeks according to severity)
– *Benign peptic ulcer*
  20 mg once daily in the morning for 7 to 10 days
– *H. pylori eradication*
  40 mg/day in 2 divided doses for 10 days (in combination with metronidazole or tinidazole + amoxicillin or clarithromycin)

Contra-indications, adverse effects, precautions
– May cause: headache, diarrhoea, skin rash, nausea, abdominal pain, dizziness.
– Avoid combination with itraconazole and ketoconazole (decreases efficacy of these drugs).
– Monitor combination with warfarin, digoxin, phenytoin.
– Do not exceed 20 mg/day in patients with severe hepatic impairment.
– *Pregnancy: avoid during the 1st trimester (safety is not established)*
– *Breast-feeding: not recommended*

Remarks
– Swallow capsules whole, do not chew.
– For mild symptoms of gastro-oesophageal reflux, use antacids as first line treatment.
– For peptic ulcer perforation: use omeprazole IV. As soon as the patient can eat, change to oral treatment (omeprazole is equally effective when given IV or orally).
– Omeprazole is recommended by the WHO for the eradication treatment of *H. pylori* but is not included in the WHO list of essential medicines.
– *Storage: below 30°C* –

ORAL REHYDRATION SALTS = ORS

Indications

– Prevention and treatment of dehydration from acute diarrhoea, cholera, etc.

Presentation

– Sachet of powder to be diluted in 1 litre of clean water.
– WHO formulation:

	grams/litre		mmol/litre
sodium chloride	2.6	sodium	75
glucose	13.5	chloride	65
potassium chloride	1.5	glucose	75
trisodium citrate	2.9	potassium	20
		citrate	10
Total weight	20.5	Total osmolarity	245

Dosage

– *Prevention of dehydration (WHO - Treatment plan A)*
Child under 24 months: 50 to 100 ml after each loose stool (approximately 500 ml/day)
Child from 2 to 10 years: 100 to 200 ml after each loose stool (approximately 1000 ml/day)
Child over 10 years and adult: 200 to 400 ml after each loose stool (approximately 2000 ml/day)

– *Treatment of moderate dehydration (WHO - Treatment plan B)*
Child and adult:
Over the first four hours:

Age	under 4 months	4 to 11 months	12 to 23 months	2 to 4 years	5 to 14 years	15 years and over
Weight	under 5 kg	5 to 7.9 kg	8 to 10.9 kg	11 to 15.9 kg	16 to 29.9 kg	30 kg and over
ORS in ml	200 to 400	400 to 600	600 to 800	800 to 1200	1200 to 2200	2200 to 4000

After four hours:
If there are no signs of dehydration: follow *Treatment plan A*.
If there are signs of moderate dehydration: repeat *Treatment plan B*.
If there are signs of severe dehydration: start IV therapy (*Treatment plan C*).

– *Treatment of severe dehydration (WHO - Treatment plan C)*
In combination with IV therapy and only to a conscious patient:
Child and adult: 5 ml/kg/hour
After 3 hours (6 hours in infants), reassess and choose the appropriate plan *A*, *B* or *C*.

Duration: as long as diarrhoea and signs of dehydration persist.

Contra-indications, adverse effects, precautions

– If the eyelids become puffy during the treatment: stop ORS, give plain water then, resume ORS according to *Treatment plan A* when the puffiness is gone.
– If case of vomiting, stop ORS for 10 min and then resume at a slower rate (very small, frequent, amounts); do not stop rehydration.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– A special ORS-formula, ReSoMal, is used under medical supervision, for severely malnourished children only. However, in malnourished children with cholera, standard ORS-formula is used instead of ReSoMal.
– *Storage:* 
Do not use the powder if it has turned into a yellow-brownish sticky substance.
Once prepared, the solution must be used within 24 hours.

PARACETAMOL = ACETAMINOPHEN
(Doliprane®, Panadol®…)

Therapeutic action
- Analgesic, antipyretic

Indications
- Mild to moderate pain
- Fever

Presentation
- 100 mg and 500 mg tablets or capsules
- 120 mg/5 ml oral solution

Dosage
- Child: 60 mg/kg/day in 3 or 4 divided doses
- Adult: 3 to 4 g/day in 3 or 4 divided doses

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
100 mg tablet	1/2 tab x 3	3/4 to 1 1/2 tab x 3	1 1/2 to 3 tab x 3	–	–	
500 mg tablet	–	–	1/4 to 1/2 tab x 3	1/2 to 1 1/2 tab x 3	2 tab x 3	

- Maximum doses: child: 80 mg/kg/day; adult: 4 g/day

Duration
- According to clinical response

Contra-indications, adverse effects, precautions
- Administer with caution to patients with hepatic impairment.
- Do not exceed indicated doses, especially in children and elderly patients. Paracetamol intoxications are severe (hepatic cytolysis).
- *Pregnancy: no contra-indication*
- *Breast-feeding: no contra-indication*

Remarks
- For the treatment of mild to moderate pain, paracetamol is used alone or in combination with an NSAID.
- For the treatment of moderate to severe pain, paracetamol is used in combination with an NSAID and a weak opioïd analgesic (codeine, tramadol) or a strong opioïd analgesic (morphine, etc.).
- Paracetamol is particularly recommended for patients allergic to acetylsalicylic acid (aspirin), patients with a history of or currently suffering from gastric problems and for pregnant women and children.
- Paracetamol has no anti-inflammatory properties.
- *Storage: below 30°C –* 

PHENOBARBITAL
(Gardenal®, Luminal®…)

Prescription under medical supervision

Therapeutic action

– Anticonvulsant, sedative and hypnotic

Indications

– Epilepsy: tonic-clonic (grand mal) and partial (focal) seizures

Presentation

– 15 mg, 30 mg, 50 mg and 100 mg tablets

Dosage

Follow national protocol.

For information:

– Child: initial dose of 3 to 4 mg/kg once daily or in 2 divided doses, increase to 8 mg/kg/day if necessary
– Adult: initial dose of 2 mg/kg once daily at bedtime (up to 100 mg maximum), then, increase gradually if necessary, to the maximum dose of 6 mg/kg/day in 2 to 3 divided doses.

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
Initial dose: 30 mg tablet			1/2 tab x 2	1 1/2 tab x 2	3 tab	
50 mg tablet				1 tab x 2	2 tab	
100 mg tablet				1 tab	1 tab	

Duration: according to clinical response

Contra-indications, adverse effects, precautions

– Do not administer in respiratory depression.
– May cause: drowsiness, depression of the central nervous system.
– Do not stop treatment abruptly.
– Risk of increased sedation when combined with alcohol and drugs acting on the central nervous system such as diazepam, chlorphenamine, chlorpromazine, etc.
– Decreases oral contraceptive efficacy.
– *Pregnancy: avoid*
– *Breast-feeding: avoid*

Remarks

– Phenobarbital is subject to international controls: follow national regulations.
– Plasma-concentrations are stable after 2 to 3 weeks. Caution: risk of accumulation.
– If necessary, phenytoin may be combined with phenobarbital.
– *Storage:* no special temperature requirements –

PHENOXYMETHYLPENICILLIN = PENICILLIN V (Oracilline®, Ospen®…)

Prescription under medical supervision

Therapeutic action

– Penicillin antibacterial

Indications

– Streptococcal tonsillitis, buccodental infections, cutaneous anthrax
– Parenteral to oral switch therapy

Presentation

– 250 mg tablet (400 000 IU)
– Powder for oral suspension, 125 mg/5 ml (200 000 IU/5 ml) and 250 mg/5 ml (400 000 IU/5 ml)

Dosage

– Child under one year: 250 mg/day in 4 divided doses
– Child from 1 to 5 years: 500 mg/day in 4 divided doses
– Child from 6 to 12 years: 1 g/day in 4 divided doses
– Adult: 2 g/day in 4 divided doses

For the treatment of tonsillitis, the daily dose may be given in 2 divided doses.

Duration

– *Streptococcal tonsillitis*: 10 days
– *Buccodental infections*: 3 to 5 days
– *Cutaneous anthrax*: 7 to 10 days

Contra-indications, adverse effects, precautions

– Do not administer to penicillin-allergic patients.
– Administer with caution to patients allergic to cephalosporins (cross-sensitivity may occur).
– May cause: gastrointestinal disturbances, allergic reactions sometimes severe. In the event of allergic reactions, stop treatment immediately.
– Do not combine with methotrexate.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– *Storage:* 
Once reconstituted, the oral suspension keeps for 15 days, below 25°C.

PHENYTOIN
(Di-hydan®, Dilantin®, Epanutin®…)

Prescription under medical supervision

Therapeutic action
– Anticonvulsant

Indications
– Epilepsy, except absence seizure (petit mal)

Presentation
– 100 mg tablet
Aslo comes in 25 mg and 50 mg tablets.

Dosage
– Child: 3 to 8 mg/kg/day in 2 to 3 divided doses
– Adult: 2 to 6 mg/kg/day in 2 to 3 divided doses; do not exceed 500 to 600 mg/day

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
100 mg tablet			1/2 tab x 2	1/2 to 1 tab x 2	1/2 to 1 tab x 3	

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Do not administer in case of hypersensitivity to phenytoin.
– May cause:
  • gastro-intestinal disturbances: gingival hypertrophy, nausea, vomiting;
  • blood disorders: monitor blood counts if possible and administer folic acid in case of prolonged use;
  • neurological disorders: dizziness, visual disturbances, mental confusion;
  • allergic reactions: cutaneous eruption, fever, adenopathy.
– Do not stop treatment abruptly, decrease daily doses gradually.
– It is not recommended to combine phenytoin with oral contraceptives, sulphonamides, or chloramphenicol. Combination with other drugs must be closely monitored (diazepam, phenobarbital, digoxin, corticosteroids, etc.).
– *Pregnancy: avoid*
– *Breast-feeding: avoid*

Remarks
– *Storage: below 30°C –*
Never use phenytoin after expiry date (risk of underdosage).

POTASSIUM CHLORIDE
(Kaleorid®LP, Slow-K®…)

Therapeutic action
– Potassium supplement

Indications
– Hypokalaemia induced by thiazide diuretics (e.g. hydrochlorothiazide) and loop diuretics (e.g. furosemide)

Presentation
– 600 mg potassium chloride controlled release tablet (8 mmol of K^+)

Warning, strengths vary with manufacturers.

Dosage
– Adult: 15 to 25 mmol/day = 2 to 3 tab/day in 2 to 3 divided doses
– Do not exceed indicated doses if potassium serum levels cannot be measured.

Duration: according to clinical response and duration of diuretic treatment

Contra-indications, adverse effects, precautions
– May cause: diarrhoea, nausea and vomiting; oeso-gastro-duodenal ulcerations.
– Tablets are to be taken at the end of meals in order to reduce the risk of gastrointestinal ulcerations.
– Do not combine with potassium-sparing diuretics (e.g. spironolactone).
– Administer with caution and reduce dosage in elderly patients and in patients with renal impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– When it is possible to monitor serum-potassium levels, higher doses may be given: if serum-potassium level is < 3.5 mmol/l, start with 52 mmol/day (4 g potassium chloride/day).
– If tablets are not available, a lack of potassium may be corrected by a diet rich in dates, bananas, mangos, oranges, tomatoes, etc.
– *Storage:* 

PRAZIQUANTEL
(Biltricide®, Cysticide®…)

Prescription under medical supervision

Therapeutic action
– Anthelminthic

Indications
– Urinary (*S. haematobium*) and intestinal (*S. mansoni, S. japonicum, S. mekongi, S. intercalatum*) schistosomiasis
– Taeniasis (*T. saginata, T. solium, H. nana*)
– Pulmonary (*P. westermani*), hepatobiliary (*O. felineus, O. viverrini, C. sinensis*) and intestinal (*F. buski, H. heterophyes, M. yokogawai*) flukes

Presentation
– 150 mg and 600 mg tablets

Dosage and duration
Child over 2 years and adult:

– *Schistosomiasis*
  • *S. haematobium, S. mansoni, S. intercalatum*: 40 mg/kg as a single dose or in 2 divided doses administered 4 hours apart
  • *S. japonicum, S. mekongi*: 40 mg/kg as a single dose or 60 mg/kg in 2 to 3 divided doses administered 4 hours apart
– *Taeniase*
  • *T. saginata, T. solium*: 5 to 10 mg/kg as a single dose
  • *H. nana:* 25 mg/kg as a single dose
– *Fluke infections*
  • lung: 75 mg/kg/day in 3 divided doses for 2 to 3 days
  • hepatobiliary: 75 mg/kg/day in 3 divided doses for 1 to 2 days
  • intestinal: 75 mg/kg in 3 divided doses, 1 day

Contra-indications, adverse effects, precautions
– Do not administer to patients with ocular cysticercosis.
– May cause:
  • drowsiness, headache, gastrointestinal disturbances, dizziness; rarely: allergic reactions.
  • neurological disorders (headache, seizures) in patients with undiagnosed neuro-cysticercosis.
– *Pregnancy: no contra-indication for the treatment of schistosomiasis and taeniasis. If immediate treatment not considered essential for fluke infections, it should be delayed until after delivery.*
– *Breast-feeding: no contra-indication*

Remarks
– Praziquantel is not active against certain liver flukes (*Fasciola hepatica* and *gigantica*). For this indication, use triclabendazole.
– *Storage:* 

PREDNISOLONE and PREDNISONE

Prescription under medical supervision

Therapeutic action

– Steroidal anti-inflammatory drug (corticosteroid)

Indications

– Symptomatic treatment of allergic and inflammatory diseases or reactions, e.g.:
  • *Pneumocystis carinii* (*jiroveci*) pneumonia with severe hypoxia
  • Certain severe forms of extra-pulmonary tuberculosis
  • Severe immune reconstitution syndrome, following initiation of antiretroviral or anti-tuberculous treatment
  • Leprous neuropathy (especially reversal reaction)
  • Severe persistent asthma, in the event of treatment failure with high doses of inhaled corticoids
– Prevention of inflammatory reaction triggered by antiparasitic treatment (e.g. trichinellosis)

Presentation

– 5 mg tablet

Dosage

The dose depends on indication, patient's response and tolerance. If treatment lasts over 10 days, a high initial dose should be reduced as quickly as possible to the lowest effective maintenance dose.

– Child:
  initial dose: 0.5 to 2 mg/kg/day maintenance dose: 0.25 to 0.5 mg/kg/day
– Adult:
  initial dose: 20 to 70 mg/day maintenance dose: 5 to 15 mg/day
– Administer preferably as a single daily dose, in the morning, with food.

Duration

– According to indication and clinical response. If the treatment lasts more than 3 weeks: do not stop abruptly, reduce the daily dose gradually.

Contra-indications, adverse effects, precautions

– Do not administer to patients with active peptic ulcer (except if ulcer under treatment); infections not controlled by a specific treatment; acute viral infection (e.g. hepatitis, herpes simplex or zoster).
– May cause (prolonged treatment with high doses): adrenal suppression, muscle atrophy, growth retardation, increased susceptibility to infections, hypokalaemia, sodium and water retention (oedema and hypertension), osteoporosis.
– In the event of acute adrenal failure, use IV hydrocortisone.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication; take tablets just after a feed and wait 4 hours before the next feed if possible.*

Remarks

– 5 mg of prednisolone has the same anti-inflammatory activity as 5 mg of prednisone, 0.75 mg of dexamethasone and 20 mg of hydrocortisone.
– *Storage: below 30°C* – 

PROGUANIL
(Paludrine®…)

Therapeutic action
– Antimalarial

Indications
– Malaria prophylaxis in non immune persons, in combination with chloroquine

Presentation
– 100 mg tablet

Dosage
– Child: 3 mg/kg/day in combination with chloroquine
– Adult: 200 mg/day in combination with chloroquine

Age	Weight	100 mg tablet
Under 8 months	5 to 8 kg	1/4 tab/day
8 months to 3 years	9 to 16 kg	1/2 tab/day
4 to 7 years	17 to 24 kg	3/4 tab/day
8 to 10 years	25 to 35 kg	1 tab/day
11 to 13 years	36 to 50 kg	1 1/2 tab/day
14 years and over	50 kg and over	2 tab/day

Duration
– Start proguanil (combined with chloroquine) 24 hours before departure, continue throughout the stay and for at least 4 weeks after return.

Contra-indications, adverse effects, precautions
– May cause: mild and transient gastrointestinal disturbances, aphthous ulceration.
– Reduce dose in patients with renal impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Take tablets with water, every day at the same time, after a meal.
– A fixed-dose combination of proguanil 200 mg + chloroquine 100 mg (Savarine®) can be used in adults (1 tab/day). Due to its strength, it cannot be used in children under 15 years.
– A fixed-dose combination tablets of proguanil-atovaquone (Malarone®) are also used in malaria prophylaxis: proguanil 100 mg + atovaquone 250 mg: 1 tab/day in children over 40 kg and adults; proguanil 25 mg + atovaquone 62.5 mg in children under 40 kg: 1 tab/day from 11 to 20 kg; 2 tab/day from 21 to 30 kg; 3 tab/day from 31 to 40 kg. For this combination, start 24 hours before departure, continue throughout the stay and for at least 7 days after return.
– *Storage: below 30°C* –  – 

PROMETHAZINE
(Phenergan®…)

Prescription under medical supervision

Therapeutic action
– Sedating antihistaminic, anti-emetic

Indications
– Allergic reactions (contact dermatitis, seasonal allergy; allergy to drugs, insect bites, food, etc.)
– Nausea and vomiting

Presentation
– 25 mg tablet

Also comes in 10 mg tablets and 1 mg/ml syrup.

Dosage
– *Allergic reactions*
  Child from 2 to 5 years: 5 to 15 mg once daily or in 2 divided doses
  Child from 5 to 10 years: 10 to 25 mg once daily or in 2 divided doses
  Child over 10 years and adult: 25 to 50 mg once daily or in 2 divided doses
– *Nausea and vomiting*
  Child from 2 to 10 years: 10 to 25 mg to be repeated every 6 hours if necessary
  Child over 10 years and adult: 25 mg to be repeated every 6 hours if necessary

Duration
– According to clinical response, single dose or for a few days if necessary

Contra-indications, adverse effects, precautions
– Do not administer to patients with urethro-prostatic disorders, glaucoma.
– Do not exceed indicated doses.
– Do not drink alcohol during treatment.
– Avoid in children under 2 years (safety is not established).
– May cause: drowsiness (administer preferably once daily at night), dryness of the mouth, constipation, urinary retention, blurred vision.
– Risk of increased sedation when combined with alcohol and drugs acting on the central nervous system: opioid analgesics, neuroleptics (chlorpromazine, haloperidol, etc.), other antihistamines (chlorphenamine), antidepressants (clomipramine, fluoxetine, etc.), phenobarbital, etc.
– *Pregnancy: avoid at the end of pregnancy; no prolonged treatment*
– *Breast-feeding: not recommended (drowsiness and risk of apnoea in the newborn infant)*

Remarks
– *Storage: below 30°C* –

PYRANTEL
(Combantrin®…)

Therapeutic action
- Anthelminthic

Indications
- Ascariasis
- Enterobiasis
- Ancylostomiasis
- Trichinellosis

Presentation
- 250 mg pyrantel embonate chewable tablet
- Oral suspension, 50 mg pyrantel embonate per ml

Dosage and duration
- *Ascariasis*
  Child and adult: 10 mg/kg as a single dose
- *Enterobiasis*
  Child and adult: 10 mg/kg as a single dose followed by a second dose after 2 to 4 weeks
- *Ancylostomiasis*
  Child and adult: 10 mg/kg as a single dose; in severe infection, 10 mg/kg once daily for 4 days
- *Trichinellosis*
  Child and adult: 10 mg/kg once daily for 5 days

Contra-indications, adverse effects, precautions
- May cause: gastrointestinal disturbances, headache, dizziness, drowsiness, skin rash.
- Reduce dosage in patients with hepatic impairment.
- *Pregnancy: avoid during the first trimester*
- *Breast-feeding: no contra-indication*

Remarks
- Preferably use albendazole or mebendazole for these indications. However, when these drugs are contra-indicated, e.g. in children under one year, pyrantel is an alternative.
- *Storage:* 

PYRAZINAMIDE
(Trebazid®, Zinamide®…)

Prescription under medical supervision

Therapeutic action
– Antituberculous antibacterial

Indications
– Tuberculosis, *in combination with other antituberculous antibacterials*

Presentation
– 400 mg tablet

Dosage
– Child and adult: 25 mg/kg once daily; maximum 2 g/day

Duration: according to protocol

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe hepatic impairment.
– Reduce the dose in patients with renal impairment.
– May cause:
  • arthralgia, nausea;
  • rarely: hepatic disorders (jaundice), urticaria, rash, acute gout, hypersensitivity reactions.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Fixed dose combinations (isoniazid+rifampicin+pyrazinamide+ethambutol or isoniazid+ rifampicin+pyrazinamide) should be preferred.
– *Storage: below 30°C* –

PYRIDOXINE = VITAMIN B6
(Benadon®, Pyroxin®…)

Therapeutic action
– Vitamin

Indications
– Prevention and treatment of isoniazid-induced peripheral neuropathy

Presentation
– 25 mg tablet

Also comes in 10 mg and 50 mg tablets.

Dosage
– *Prevention of isoniazid neuropathy*
  Child under 5 kg: 5 mg once daily
  Child over 5 kg and adult: 10 mg once daily
– *Treatment of isoniazid neuropathy*
  Child: 50 mg once daily
  Adult: 150 mg/day in 3 divided doses

Duration
– *Prevention*: as long as treatment with isoniazid continues.
– *Treatment*: according to clinical response (in general, ≤ 3 weeks) then, preventive dose, as long as treatment with isoniazid continues.

Contra-indications, adverse effects, precautions
– No contra-indication.
– May cause: peripheral neuropathy in the event of prolonged use with doses ≥ 200 mg/day.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– In children receiving isoniazid prophylaxis or treatment for tuberculosis: concomitant administration of pyridoxine at preventive dosage is recommended for children under 5 years and all children infected with HIV.
– Pyridoxine is also used for the prevention and treatment of cycloserin-induced neuropathy (150 to 200 mg/day in adults, in divided doses).
– *Storage:* 

PYRIMETHAMINE
(Daraprim®, Malocide®…)

Prescription under medical supervision

Therapeutic action
- Antiprotozoal

Indications
- Treatment and secondary prophylaxis of toxoplasmosis in immunodeficient patients, in combination with sulfadiazine or clindamycin
- Primary prophylaxis of toxoplasmosis in immunodeficient patients, in combination with dapsone (only if cotrimoxazole cannot be used)
- Second-line treatment of isosporiasis in immunodeficient patients (only if cotrimoxazole cannot be used)

Presentation
- 25 mg tablet

Dosage and duration
- *Treatment of toxoplasmosis*
  Adult: 200 mg in 2 divided doses on the first day, then 75 to 100 mg/day for at least 6 weeks
- *Secondary prophylaxis of toxoplasmosis*
  Adult: 25 to 50 mg/day, as long as necessary
- *Primary prophylaxis of toxoplasmosis*
  Adult: 50 to 75 mg/week, as long as necessary
- *Treatment of isosporiasis*
  Adult: 50 to 75 mg/day for 10 days

Contra-indications, adverse effects, precautions
- Do not administer to patients with severe renal or hepatic impairment.
- May cause: gastrointestinal disturbances, seizures, leucopenia, thrombocytopenia, megaloblastic anaemia due to folinic acid deficiency.
- Administer calcium folinate to prevent folinic acid deficiency.
- Avoid if possible combination with other folate antagonists: cotrimoxazole, methotrexate (increased risk of folinic acid deficiency).
- Monitor combination with zidovudine (increased risk of zidovudine-associated haematotoxicity).
- *Pregnancy: CONTRA-INDICATED during the first trimester*
- *Breast-feeding: no contra-indication; however avoid concomitant administration of other folate antagonists*

Remarks
- The combination of pyrimethamine + sulfadoxine (Fansidar®) is used for the treatment of uncomplicated falciparum malaria.
- *Storage: below 30°C*

QUININE

Prescription under medical supervision

Therapeutic action

– Antimalarial

Indications

– Treatment of uncomplicated falciparum malaria
– Shift from injectable to oral quinine for the treatment of severe falciparum malaria

Presentation

– 200 mg and 300 mg quinine sulfate or bisulfate tablets

Dosage and duration

Dosage is expressed in terms of salt. With the exception of quinine bisulfate, the dosage is the same for all quinine salts (sulfate, hydrochloride, dihydrochloride):

– Child and adult ≤ 50 kg: 30 mg/kg/day in 3 divided doses at 8-hour intervals for 7 days
– Adult > 50 kg: 1800 mg/day in 3 divided doses at 8-hour intervals for 7 days

Weight	200 mg tablet	300 mg tablet
3 to 6 kg	1/4 tab x 3	–
7 to 12 kg	1/2 tab x 3	–
13 to 17 kg	–	1/2 tab x 3
18 to 25 kg	1 tab x 3	–
26 to 35 kg	–	1 tab x 3
36 to 50 kg	2 tab x 3	–
> 50 kg	3 tab x 3	2 tab x 3

As bisulfate tablets contain a lower concentration of quinine, a higher dose is required: 40 mg/kg/day in children and 2.5 g/day in adults, in 3 divided doses.

Contra-indications, adverse effects, precautions

– May cause: headache, skin rash; visual, auditory and gastrointestinal disturbances.
– Do not exceed indicated doses: risk of toxicity in the event of overdose.
– If the patient vomits within one hour after administration, repeat the full dose.
– Do not combine with chloroquine, halofantrine and mefloquine.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– 10 mg of quinine sulfate or hydrochloride or dihydrochloride = 8 mg of quinine base; 14 mg of quinine bisulfate = 8 mg of quinine base.
– In certain regions of South-East Asia, quinine is combined with doxycycline or clindamycin, due to a reduction in *P. falciparum* sensitivity to quinine.
– Quinine should not be used for prophylaxis.
– *Storage: below 30°C* –

RESOMAL
Rehydration **So**lution for **Mal**nutrition

Prescription under medical supervision

Therapeutic action
– Oral rehydration salts with high potassium and low sodium contents

Indications
– Prevention and treatment of dehydration, in patients suffering from complicated acute malnutrition only

Presentation
– Sachet containing 84 g of powder, to be diluted in 2 litres of clean, boiled and cooled water
– Sachet containing 420 g of powder, to be diluted in 10 litres of clean, boiled and cooled water

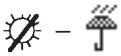
Composition for one litre

	mmol/litre		mmol/litre
Glucose	55	Citrate	7
Saccharose	73	Magnesium	3
Sodium	45	Zinc	0.3
Potassium	40	Copper	0.045
Chloride	70	Osmolarity	294 mEq/litre

Dosage and duration
– *Prevention of dehydration*
Child under 2 years: 50 to 100 ml after each loose stool as long as diarrhoea persists
Child over 2 years: 100 to 200 ml after each loose stool as long as diarrhoea persists
Adult: 200 to 400 ml after each loose stool as long as diarrhoea persists

– *Treatment of dehydration*
Child and adult: 5 ml/kg every 30 minutes over the first 2 hours, then 5 to 10 ml/kg/hour for the next 4 to 10 hours, until dehydration is corrected.

Contra-indications, adverse effects, precautions
– Do not administer to patients with cholera or uncomplicated acute malnutrition: use standard ORS instead.
– May cause: heart failure when administered too rapidly. During treatment, closely monitor the rate of administration in order to avoid overhydration. Increase in respiratory and pulse rates and appearance or increase of oedema are signs of over rapid rehydration. In this event, stop ReSoMal for one hour then reassess the patient's condition.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– *Storage: below 30°C* –  –
Do not use the powder if it has turned sticky.
Once prepared, the solution should be used within 24 hours.

RETINOL = VITAMIN A

Therapeutic action
– Vitamin

Indications
– Prevention of vitamin A deficiency
– Treatment of vitamin A deficiency (xerophthalmia)

Presentation
– 200 000 IU capsule
Also comes in 10 000 IU coated tablet, 50 000 IU capsule and 100 000 IU/ml oral solution.

Dosage and duration
– *Prevention of vitamin A deficiency*
Child under 6 months: 50 000 IU as a single dose
Child from 6 months to 1 year: 100 000 IU as a single dose every 4 to 6 months
Child over 1 year and adult: 200 000 IU as a single dose every 4 to 6 months
– *Treatment of vitamin A deficiency (xerophthalmia)*
Child under 6 months: 50 000 IU once daily at Day 1, Day 2 and Day 8 or 15
Child from 6 months to 1 year: 100 000 IU once daily at Day 1, Day 2 and Day 8 or 15
Child over 1 year and adult: 200 000 IU once daily at Day 1, Day 2 and Day 8 or 15

AGE	**0**	**6 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**6 kg**	**8 kg**	**15 kg**	**35 kg**	
Prevention						
50 000 IU capsule	1 cap	2 cap	–	–	–	
200 000 IU capsule	2 drops	4 drops	1 cap	1 cap	1 cap	
Treatment						
50 000 IU capsule	1 cap	2 cap	–	–	–	
200 000 IU capsule	2 drops	4 drops	1 cap	1 cap	1 cap	

Contra-indications, adverse effects, precautions
– Do not exceed indicated doses.
– Overdosage may cause: gastrointestinal disturbances, headache, raised intracranial pressure (bulging fontanelle in infants); foetal abnormalities.
– <u>Pregnancy</u>:
Prevention of vitamin A deficiency: do not administer during pregnancy. After delivery, administer 200 000 IU as a single dose.
Treatment of vitamin A deficiency: dosage depends on severity of eye lesions:
  • *Mild xerophthalmia (night blindness, Bitot's spots): 10 000 IU once daily or 25 000 IU once weekly for at least 4 weeks.*
  • *Severe xerophthalmia (corneal lesion): 200 000 IU once daily at Day 1, Day 2 and Day 8 or 15*
– <u>Breast-feeding</u>: *no contra-indication at recommended doses*

Remarks
– Administer preventive treatment systematically to all children suffering from malnutrition (single dose).
– Administer curative treatment (3 days) systematically to children suffering from measles to prevent the potential complications of measles.
– One 200 000 IU capsule contains about 8 drops (1 drop = 25 000 IU).
– <u>Storage</u>: *below 25°C* –

RIFAMPICIN
(Rifadin®…)

Prescription under medical supervision

Therapeutic action
– Antituberculous and antileprotic antibacterial

Indications
– Tuberculosis, *in combination with other antituberculous antibacterials*
– Paucibacillary leprosy, *in combination with dapsone*
– Multibacillary leprosy, *in combination with dapsone and clofazimine*

Presentation
– 150 mg and 300 mg tablets or capsules

Dosage
– *Tuberculosis*
  Child and adult: 10 mg/kg once daily, on an empty stomach; maximum 600 mg/day.
– *Paucibacillary and multibacillary leprosy*
  Child < 10 years: 12 to 15 mg/kg once monthly, on an empty stomach (round-up to 300 mg once monthly)
  Child from 10 to 14 years: 450 mg once monthly, on an empty stomach
  Adult: 600 mg once monthly, on an empty stomach

Duration
– *Tuberculosis*: according to protocol
– *Paucibacillary leprosy*: 6 months; *multibacillary leprosy*: 12 months

Contra-indications, adverse effects, precautions
– Do not administer to patients with jaundice or allergy to rifamycins.
– May cause:
  • orange-red discoloration of urine, tears, saliva, sputum (normal, harmless);
  • gastrointestinal disturbances, headache, drowsiness; liver disorders (jaundice);
  • influenza-like syndrome (more frequent when treatment is not taken regularly);
  • rarely: thrombocytopenia, hypersensitivity reactions.
– If jaundice develops, rifampicin should be discontinued until the symptoms resolve then re-introduced and administered at low dose (8 mg/kg/day). If purpura develops, discontinue permanently rifampicin.
– Do not combine with nevirapine, indinavir, nelfinavir, lopinavir/ritonavir.
– Rifampicin accelerates the hepatic metabolism and reduces the effect of many drugs (oral contraceptives, antidiabetics and anticoagulants; corticoids, phenytoin, azole antifungals, etc.):
  • In women, use a non-hormonal contraception or injectable medroxyprogesterone or make sure that the oral contraceptive used contains 50 µg ethinylestradiol per tablet.
  • In the event of concomitant fluconazole administration, administer each drug 12 hours apart (rifampicin in the morning, fluconazole in the evening).
  • For the other drugs, adjust dosage if necessary.
– *Pregnancy: no contra-indication. Risk of maternal and neonatal bleeding disorders when the mother receives rifampicin in late pregnancy. Administer phytomenadione (vitamin K) to reduce the risk.*
– *Breast-feeding: no contra-indication*

Remarks
– For the treatment of tuberculosis, fixed dose combinations (isoniazid+rifampicin+pyrazinamide +ethambutol or isoniazid+rifampicin+pyrazinamide or isoniazid+rifampicin) should be preferred.
– For the treatment of *single skin lesion* paucibacillary leprosy, rifampicin (600 mg) + ofloxacin (400 mg) + minocycline (100 mg) are administered as a single dose.
– Rifampicin is also used in combination with co-trimoxazole for the treatment of brucellosis in children < 8 years and pregnant/breastfeeding women.
– *Storage: below 30°C* –

RITONAVIR = RTV
(Norvir®)

Prescription under medical supervision

Therapeutic action
– Antiretroviral, HIV-1 and HIV-2 protease inhibitor

Indications
– Booster for protease inhibitors (atazanavir, darunavir, saquinavir, etc.) in HIV-1 or HIV-2 infection. Ritonavir should not be used alone.

Presentation
– 100 mg capsule
– 80 mg/ml oral solution, containing 43% alcohol (v/v)

Dosage
– Adult:
  • Capsule: 100 mg once daily or 200 mg/day in 2 divided doses, depending on the protease inhibitor co-administered
  • Oral solution: 1.25 ml once daily or 2.5 ml/day in 2 divided doses, depending on the protease inhibitor co-administered

Duration: depending on the efficacy and tolerance of ritonavir.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe hepatic impairment.
– Adverse effects associated with the use of ritonavir as a booster are dependent on the other protease inhibitor.
– Ritonavir reduces the efficacy of oral contraceptives: use a non-hormonal contraception or injectable medroxyprogesterone or make sure that the oral contraceptive used contains 50 µg ethinylestradiol per tablet.
– Administer with caution to patients with diabetes or haemophilia and, for oral solution, to patients with hepatic disease or epilepsy.
– *Pregnancy: **CONTRAINDICATED** for oral solution; no contra-indication for capsules.*

Remarks
– Take with meals.
– Also comes in fixed-dose combination tablets containing lopinavir-ritonavir (Kaletra®).
– *Storage:*
  • *Capsule: to be kept refrigerated (2°C to 8°C). The patient may keep an opened bottle of capsules for 30 days if stored below 25°C.*
  • *Oral solution: between 20°C to 25°C for 30 days maximum. Do not refrigerate.*

SALBUTAMOL = ALBUTEROL
(Ventolin®…)

Prescription under medical supervision

Therapeutic action
– Bronchodilator

Indications
– Treatment of persistent asthma not controlled by inhaled corticosteroids (beclometasone)

Presentation
– 2 mg and 4 mg tablets
– 2 mg/5 ml syrup

Dosage
– Child from 2 to 6 years: 3 to 6 mg/day in 3 divided doses
– Child from 6 to 12 years: 6 mg/day in 3 divided doses
– Child over 12 years and adult: 6 to 12 mg/day in 3 divided doses

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Administer with caution to patients with diabetes mellitus, hyperthyroidism, arrhythmia, angina, hypertension.
– May cause: tachycardia, tremor, headache, dizziness, hypokalaemia, hyperglycaemia, gastrointestinal disturbances.
– Monitor combination with: furosemide, hydrochlorothiazide, corticosteroids, theophylline (increased risk of hypokalaemia).
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Oral salbutamol in not indicated in the treatment of asthma crisis: use inhaled salbutamol.
– Oral salbutamol is not very effective in children under 2 years.
– *Storage: below 30°C* –

SALBUTAMOL aerosol = ALBUTEROL aerosol (Salbulin®, Ventolin®…)

Prescription under medical supervision

Therapeutic action
- Bronchodilator

Indications
- Asthma attack

Presentation
- Pressurized inhalation solution, 100 micrograms/inhalation

Dosage and administration technique
- Child: 100 micrograms (1 inhalation) to be repeated after a few minutes if necessary
- Adult: 100 to 200 micrograms (1 or 2 inhalations) to be repeated 1 or 2 times after a few minutes if necessary. Do not exceed 15 inhalations/day.

Shake the inhaler. Breathe out as completely as possible. Place the lips tightly around the mouthpiece. Inhale deeply while activating the inhaler. Hold breath 10 seconds before exhaling. Verify that the inhalation technique is correct.
Co-ordination between the hand and inhalation is very difficult in certain patients (children under 6 years, elderly patients, patients with severe dyspnoea, etc.). Use a spacer to facilitate administration and improve the efficacy of treatment.

Contra-indications, adverse effects, precautions
- May cause: tremor, tachycardia, headache, dizziness, especially after repeated use or abuse.
- In the event of bronchial infection, administer simultaneously with appropriate antibacterial treatment.
- If usual effective doses become insufficient, consider another route of administration (nebulisation, injection) and re-evaluate the severity of asthma.
- *Pregnancy: no contra-indication*
- *Breast-feeding: no contra-indication*

Remarks
- Clean the mouthpiece before and after each use.
- Do not pierce or incinerate used aerosol containers. Empty all residual gas, then bury.
- *Storage: below 30°C*

SAQUINAVIR = SQV
(Fortovase®, Invirase®)

Prescription under medical supervision

Therapeutic action
– Antiretroviral, HIV-1 and HIV-2 protease inhibitor

Indications
– HIV-1 or HIV-2 infection, in combination with two nucleoside reverse transcriptase inhibitors and with low-doses of ritonavir as booster

Presentation
– 200 mg capsule or soft capsule

Dosage
– Adult: 2 g/day in 2 divided doses (in combination with 200 mg of ritonavir/day in 2 divided doses)

Duration
– The duration of treatment depends on the efficacy and tolerance of saquinavir.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe hepatic impairment.
– Do not administer to patients under 16 years of age.
– May cause:
  • neurological disorders (peripheral neuropathy, paraesthesia), hepatic disorders (jaundice, raised transaminases), metabolic disorders (lipodystrophy, hyperlipidaemia, diabetes mellitus with glucose intolerance and/or insulin resistance),
  • gastrointestinal disturbances, headache, fatigue, fever, rash, pruritus; neutropenia, thrombocytopenia, raised creatinine phosphokinase.
– Do not combine with rifampicin (hepatotoxicity).
– Administer with caution to patients with haemophilia (risk of haemorrhage) or renal or hepatic impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: not recommended*

Remarks
– Take with meals or immediately after meals.
– *Storage:*
  • *Capsule: below 30°C*
  • *Soft capsule: to be kept refrigerated (2°C to 8°C). The patient may keep an opened bottle of soft capsules for 3 months if stored below 25°C.*

SPIRONOLACTONE
(Aldactone®, Spiroctan®…)

Prescription under medical supervision

Therapeutic action
– Potassium-sparing diuretic, antagonist of aldosterone

Indications
– Oedema associated with congestive heart failure, hepatic cirrhosis and nephrotic syndrome

Presentation
– 25 mg tablet

Dosage
– *Oedema in congestive heart failure*
  Adult: 100 mg/day (up to 200 mg/day in severe cases) then, when oedema is controlled, maintenance dose of 25 mg/day
– *Ascites in hepatic cirrhosis*
  Adult: 100 to 400 mg/day. When weight is stable, administer the lowest possible maintenance dose, in order to prevent adverse effects.
– *Oedema in nephrotic syndrome*
  Adult: 100 to 200 mg/day

The daily dose can be administered in 2 to 3 divided doses or once daily.

Duration: according to clinical response; avoid prolonged use.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe renal impairment, anuria, hyperkalaemia > 5 mmol/l, hyponatraemia.
– Do not combine with potassium salts, potassium-sparing diuretics; lithium (risk of lithium toxicity).
– Avoid or closely monitor combination with angiotensin-converting enzyme inhibitors (risk of severe, potentially fatal hyperkalaemia), digoxin (risk of digoxin toxicity) and reduce dosages.
– May cause:
  • hyperkalaemia (especially in elderly or diabetics patients, patients with renal impairment or patients taking NSAIDs), hyponatraemia; metabolic acidosis (in patients with decompensated cirrhosis).
  • gynecomastia, metrorrhagia, impotence, amenorrhoea, gastrointestinal disturbances, headache, skin rash, drowsiness.
– Administer with caution in patients with hepatic or renal impairment or diabetes.
– Monitor regularly plasma-potassium levels.
– *Pregnancy: avoid, use only if clearly needed (risk of feminisation of foetus); spironolactone is not indicated in the treatment of pregnancy-related oedema.*
– *Breast-feeding: no contra-indication*

Remarks
– In children with oedema, the daily dose is 1 to 3 mg/kg/day.
– Spironolactone is also used for the diagnosis and treatment of primary hyperaldosteronism.
– *Storage: below 30°C –* 

STAVUDINE = d4T
(Stavir®, Zerit®, Zeritavir®)

Prescription under medical supervision

Therapeutic action
– Antiretroviral, HIV-1 and HIV-2 nucleoside reverse transcriptase inhibitor

Indications
– HIV-1 or HIV-2 infection, in combination with other antiretroviral drugs

Presentation
– 15 mg, 20 mg and 30 mg capsules
– 1 mg/ml, powder for oral solution

Dosage
– Child over 3 months and under 25 kg: 2 mg/kg/day in 2 divided doses
– Child ≥ 25 kg and adult: 60 mg/day in 2 divided doses

Weight	1 mg/ml oral solution	Capsules		
		15 mg	20 mg	30 mg
5 to 9 kg	7.5 ml x 2	–	–	–
10 to 14 kg	12.5 ml x 2	1 caps x 2	–	–
15 to 19 kg	18 ml x 2	–	1 caps x 2	–
20 to 24 kg	–	–	1 caps x 2	–
≥ 25 kg	–	–	–	1 caps x 2

Duration: depending on the efficacy and tolerance of stavudine.

Contra-indications, adverse effects, precautions
– Do not administer to patients with history of peripheral neuropathy or pancreatitis.
– May cause:
  • peripheral neuropathy, metabolic disorders (lipodystrophy, hyperlipidaemia, etc.), gastrointestinal disturbances (diarrhoea, nausea, vomiting, etc.);
  • lactic acidosis, severe pancreatic or hepatic disorders (in these events, stop antiretroviral treatment; once the symptoms have resolved, prescribe an antiretroviral regimen without stavudine).
– Do not combine with zidovudine (antagonism); avoid combination with didanosine.
– Reduce dosage in patients with renal impairment.
– *Pregnancy: no contra-indication. Do not combine with didanosine.*

Remarks
– Also comes in fixed-dose combination tablets containing stavudine-lamivudine-nevirapine (Triomune®…) or stavudine-lamivudine (Coviro®…).
– *Storage: below 30°C*
  Once prepared, the oral solution must be kept refrigerated (2°C to 8°C) and may be used for up to 30 days.

STAVUDINE/LAMIVUDINE/NEVIRAPINE = d4T/3TC/NVP (Triomune®, Triviro®…)

Prescription under medical supervision

Therapeutic action
– Combination of 3 antiretrovirals

Indications
– HIV-1 infection

Presentation
– 6 mg d4T/30 mg 3TC/50 mg NVP dispersible tablet
– 12 mg d4T/60 mg 3TC/100 mg NVP dispersible tablet
– 30 mg d4T/150 mg 3TC/200 mg NVP tablet

Dosage
– Child less than 25 kg: see table below

Weight	6 mg d4T/30 mg 3TC/50 mg NVP tablet	12 mg d4T/60 mg 3TC/100 mg NVP tablet
3 to 5 kg	1 tab x 2	–
6 to 9 kg	1 1/2 tab x 2	–
10 to 13 kg	2 tab x 2	1 tab x 2
14 to 19 kg	2 1/2 tab x 2	–
20 to 24 kg	3 tab x 2	1 1/2 tab x 2

– Child ≥ 25 kg and adult: one 30 mg d4T/150 mg 3TC/200 mg NVP tablet twice daily

Duration: depending on the efficacy and tolerance of treatment.

Contra-indications, adverse effects, precautions
– Do not administer to patients with history of peripheral neuropathy, pancreatitis, hepatic disorders or intolerance to nevirapine that led to discontinuation of treatment.
– May cause:
  • adverse effects common to all 3 antiretrovirals: gastrointestinal disturbances;
  • adverse effects of stavudine: see stavudine;
  • adverse effects of lamivudine: see lamivudine;
  • adverse effects of nevirapine: see nevirapine.
– Monitor if possible liver enzyme level (ALAT) during the first 2 months, then every 6 months. If the enzyme level reaches 5 times the normal level, stop nevirapine immediately.
– Nevirapine reduces the efficacy of oral contraceptives: use a non-hormonal contraception or injectable medroxyprogesterone or make sure that the oral contraceptive used contains 50 µg ethinylestradiol per tablet.
– Do not combine with zidovudine or rifampicin.
– *Pregnancy: no contra-indication*

Remarks
– To improve tolerance of NVP, administer half doses for the first 14 days of treatment. Therefore, start triple therapy by using d4T/3TC co-formulations (Coviro®) and nevirapine tablets (Neravir®, Nevimune®, Viramune®). After the initial 14-day phase of treatment, use the co-formulation d4T/3TC/NVP.
– *Storage: below 25°C*

SULFADIAZINE
(Adiazine®…)

Prescription under medical supervision

Therapeutic action
– Sulfonamide antibacterial

Indications
– Treatment and secondary prophylaxis of toxoplasmosis in immunodeficient patients, in combination with pyrimethamine

Presentation
– 500 mg tablet

Dosage and duration
– *Treatment of toxoplasmosis*
Adult: 4 to 6 g/day in 2 to 3 divided doses for 6 weeks minimum
– *Secondary prophylaxis of toxoplasmosis*
Adult: 2 to 3 g/day in 2 divided doses, as long as necessary

Contra-indications, adverse effects, precautions
– Do not administer to sulfonamide-allergic patients; patients with severe renal or hepatic impairment.
– May cause:
  • gastrointestinal disturbances, renal disorders (crystalluria, etc.), photosensitivity, megaloblastic anaemia due to folinic acid deficiency; haemolytic anaemia in patients with G6PD deficiency,
  • allergic reactions (fever, rash, etc.) sometimes severe (Lyell's and Stevens-Johnson syndromes, haematological disorders, etc.). In these cases, stop treatment immediately.
– Adverse effects occur more frequently in patients with HIV infection.
– Monitor blood count if possible.
– Reduce the dose by half in patients with renal impairment.
– Do not combine with methotrexate and phenytoin.
– Administer calcium folinate systematically to prevent folinic acid deficiency.
– Drink a lot of liquid during treatment.
– *Pregnancy: no contra-indication. However, avoid using during the last month of pregnancy (risk of jaundice and haemolytic anaemia in the newborn infant).*
– *Breast-feeding: avoid if premature infant, jaundice, low-birth weight, infant under one month of age. If sulfadiazine is used, observe the infant for signs of jaundice.*

Remarks
– *Storage:* 

SULFADOXINE + PYRIMETHAMINE = SP
(Fansidar®…)

Prescription under medical supervision

Therapeutic action
– Antimalarial

Indications
– Treatment of uncomplicated falciparum malaria, in combination with artesunate

Presentation
– 500 mg sulfadoxine + 25 mg pyrimethamine tablet

Dosage and duration
– Child over 2 months and adult: 25 mg/kg sulfadoxine + 1.25 mg/kg pyrimethamine as a single dose

Weight	**5 kg**	**10 kg**	**20 kg**	**30 kg**	**≥ 45 kg**
500 mg + 25 mg tablet	1/2 tab	1 tab	11/2 tab	2 tab	3 tab

Contra-indications, adverse effects, precautions
– Do not administer to patients with allergy to sulfonamides, severe hepatic or renal impairment.
– May cause: gastrointestinal disturbances, allergic reactions sometimes severe (Lyell's and Stevens-Johnson syndromes), anaemia, leucopenia, agranulocytosis, thrombocytopenia, haemolytic anaemia in patients with G6PD deficiency.
– Do not combine with: coartemether, methotrexate, phenytoin.
– Do not give folic acid neither the same day nor within one week after SP administration.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– The combination artesunate-SP exists in co-blisters (Arsudar®, etc.). The two active ingredients are not combined in the same tablet but are presented in the same blister to facilitate compliance.
– In areas of high transmission, intermittent presumptive treatment with SP can be given to pregnant women in the 2nd and 3rd trimester to reduce the consequences of malaria (anaemia, low birth weight, etc.). Check for national recommendations.
– Sulfadoxine + pyrimethamine should not be used for prophylaxis.
– *Storage:* 

THIAMINE = VITAMIN B1
(Benerva®, Betaxin®…)

Therapeutic action

– Vitamin

Indications

– Vitamin B1 deficiencies: beriberi, alcoholic neuritis

Presentation

– 50 mg tablet

Also comes in 10 mg and 25 mg tablets.

Dosage and duration

– *Infantile beriberi*
  10 mg once daily, until complete recovery (3 to 4 weeks)
– *Acute beriberi*
  150 mg/day in 3 divided doses for a few days, until symptoms improve, then 10 mg/day until complete recovery (several weeks)
– *Mild chronic deficiency*
  10 to 25 mg once daily

Contra-indications, adverse effects, precautions

– No contra-indication, or adverse effects with oral thiamine.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– In the treatment of severe cases, the use of injectable thiamine is justified to correct the disorder as rapidly as possible, but is no longer justified when symptoms have improved.
– Vitamin B1 deficiency often occurs in association with other vitamin B-complex deficiencies, especially in alcoholic patients.
– Thiamine is also called aneurine.
– *Storage: in airtight non-metallic container* –

TINIDAZOLE
(Fasigyn®, Tindamax®, Tindol®…)

Prescription under medical supervision

Therapeutic action

– Antiprotozoal, antibacterial (group of nitroimidazoles)

Indications

– Amoebiasis, giardiasis, trichomoniasis
– Bacterial vaginitis, infections due to anaerobic bacteria (e.g. *Clostridium* sp, *Bacteroides* sp)

Presentation

– 500 mg tablet

Dosage and duration

– *Amoebiasis*
  Child: 50 mg/kg once daily, without exceeding 2 g
  Adult: 2 g once daily
  The treatment lasts 3 days in intestinal amoebiasis; 5 days in hepatic amoebiasis.
– *Giardiasis, trichomoniasis* and *bacterial vaginitis*
  Child: 50 mg/kg as a single dose, without exceeding 2 g
  Adult: 2 g as a single dose
  In the event of trichomoniasis, also treat sexual partner.
– *Infections due to anaerobic bacteria*
  Child over 12 years and adult: initially 2 g then 1 g once daily or in 2 divided doses
  According to indication, tinidazole may be used in combination with other antibacterials; treatment duration depends on indication.

Contra-indications, adverse effects, precautions

– Do not administer to patients with allergy to tinidazole or another nitroimidazole (metronidazole, secnidazole, etc.).
– May cause: gastrointestinal disturbances; rarely: allergic reactions, brownish urine, headache, dizziness. Risk of antabuse reaction when combined with alcohol.
– Administer with caution in patients taking oral anticoagulants (risk of haemorrhage), lithium, phenytoin (increased plasma concentrations of these drugs).
– *Pregnancy: no contra-indication; divide into smaller doses, avoid prolonged use.*
– *Breast-feeding: significantly excreted in milk (risk of gastrointestinal disturbances in breastfed infants); divide into smaller doses, avoid prolonged use.*

Remarks

– *Storage: below 25°C* –

TRAMADOL
(Tramal®, Zamadol®, Zydol®…)

Prescription under medical supervision

Therapeutic action
– Centrally acting analgesic (weak opioid, serotonin-norepinephrine reuptake inhibitor)

Indications
– Moderate acute pain and moderate to severe chronic pain

Presentation
– 50 mg capsule
– 100 mg/ml oral solution (1 drop = 2.5 mg)

Dosage
– Child over 6 months: 2 mg/kg every 6 hours
– Adult: 50 to 100 mg every 4 to 6 hours, without exceeding 400 mg/day

Duration
– According to clinical evolution. In the event of prolonged treatment, do not stop abruptly, reduce doses progressively.

Contra-indications, adverse effects, precautions
– Do not administer in the event of severe respiratory depression and to patients that risk seizures (e.g. epilepsy, head injury, meningitis).
– May cause:
  • dizziness, nausea, vomiting, drowsiness, dry mouth, sweating;
  • rarely: allergic reactions, seizures, confusion;
  • exceptionally: withdrawal symptoms; respiratory depression in the event of overdosage.
– Do not combine with opioid analgesics, including codeine.
– Avoid combination with carbamazepine, fluoxetine, chlorpromazine, promethazine, clomipramine, haloperidol, digoxin.
– Reduce doses (1 mg/kg) and administer every 12 hours in elderly patients and in patients with severe renal or hepatic impairment (risk of accumulation).
– *Pregnancy and breast-feeding: no contra-indication. The child may develop adverse effects (drowsiness) when the mother receives tramadol at the end of the 3rd trimester and during breast-feeding. In these events, administer with caution, for a short period, at the lowest effective dose, and monitor the child.*

Remarks
– Doses administered for the treatment of neuropathic pain are often lower than those administered for the treatment of acute pain.
– Tramadol is approximately 10 times less potent than morphine.
– In some countries, tramadol is on the list of narcotics: follow national regulations.
– *Storage:*  – 

TRICLABENDAZOLE
(Egaten®, Fasinex®)

Prescription under medical supervision

Therapeutic action
- Anthelminthic

Indications
- Fascioliasis (*Fasciola hepatica* and *Fasciola gigantica* infections)
- Paragominiasis

Presentation
- 250 mg tablet

Dosage and duration
- *Fascioliasis*
  Child and adult: 10 mg/kg as a single dose
- *Paragominiasis*
  Child and adult: 20 mg/kg in 2 divided doses

Contra-indications, adverse effects, precautions
- Do not administer to patients with hypersensitivity to triclabendazole or other benzimidazoles (albendazole, flubendazole, mebendazole, tiabendazole).
- May cause: abdominal pain, mild fever, headache, dizziness.
- *Pregnancy: no contra-indication*
- *Breast-feeding: no contra-indication*

Remarks
- Take tablets after meals.
- Due to its efficacy, good tolerance, and ease of administration, triclabendazole is the drug of choice for fascioliasis.
- Bithionol (Bitin®, Lorothidol®) may be used as an alternative to triclabendazole in the treatment of fascioliasis: 30 mg/kg/day for 5 days.
- Unlike infections with other flukes, fascioliasis does not respond to praziquantel.
- *Storage: below 30°C* –

VALPROIC ACID = SODIUM VALPROATE (Convulex®, Depakine®, Epilim®...)

Prescription under medical supervision

Therapeutic action
– Antiepileptic

Indications
– Generalised and partial epilepsy

Presentation
– 200 mg and 500 mg enteric coated tablets

Also comes in syrup and oral solution for paediatric use.

Dosage
– Child under 20 kg: 20 mg/kg/day in 2 divided doses
– Child over 20 kg: initially 400 mg (irrespective of weight) in 2 divided doses, then increase the dose gradually until the optimal dose is reached, usually 20 to 30 mg/kg/day in 2 divided doses
– Adult: initially 600 mg/day in 2 divided doses, then increase by 200 mg every 3 days until the optimal dose is reached, usually 1 to 2 g/day in 2 divided doses (20 to 30 mg/kg/day)

Duration: lifetime treatment

Contra-indications, adverse effects, precautions
– Do not administer to patients with pancreatitis, hepatic disease (or history of).
– May cause:
  • increase in the frequency of seizures at the beginning of therapy, weight gain, gastro-intestinal disturbances, hepatic dysfunction,
  • rarely: pancreatitis, extrapyramidal symptoms, cognitive disorders and behavorial disturbances, confusion, severe allergic reactions (Lyell's and Stevens-Johnson syndromes), amenorrhoea; thrombocytopenia, prolongation of bleeding time.
– Monitor, if possible, liver transaminase concentrations and prothrombine time during first 3-6 months of therapy.
– Stop treatment in the event of jaundice or gastrointestinal manifestations of hepatitis, significant lasting increase of transaminases, prolonged prothrombine time.
– Reduce dosage in patients with renal impairment.
– Do not combine with mefloquine (increased risk of seizures).
– Monitor combination with: tricyclic antidepressants, other antiepileptics.
– If other antiepileptic drugs have been prescribed, reduce the dose of these drugs and increase the dose of valproic acid gradually over 2 weeks.
– *Pregnancy: risk of neural tube defect, limb malformations and craniofacial abnormalities, if used during the first trimester. Do not start treatment during the first trimester, except if vital and there is no alternative. However, if treatment has been started before a pregnancy, do not stop treatment, administer the daily dose in smaller fractioned doses and monitor the newborn infant (risk of haemorrhagic disease, non related to vitamin K deficiency).*
  The administration of folic acid before conception and during the first trimester seems to reduce the risk of neural tube defect.
– *Breast-feeding: no contra-indication*

Remarks
– Take with meals.
– *Storage: below 30°C* – 

ZIDOVUDINE = AZT = ZDV
(Retrovir®)

Prescription under medical supervision

Therapeutic action
– Antiretroviral, HIV-1 and HIV-2 nucleoside reverse transcriptase inhibitor

Indications
– HIV-1 or HIV-2 infection, in combination with other antiretroviral drugs

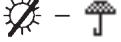
Presentation
– 100 mg and 250 mg capsules and 300 mg tablet
– 50 mg/5 ml oral solution

Dosage
– Premature infant: 3 mg/kg/day in 2 divided doses for the first 2 weeks after birth then 8 mg/kg/day in 2 divided doses
– Child under 4 weeks: 8 mg/kg/day in 2 divided doses
– Child from 4 weeks to 13 years: 360 to 480 mg/m²/day in 2 divided doses
– Adult: 600 mg/day in 2 divided doses

Weight	Oral solution 10 mg/ml	100 mg capsule	250 mg capsule	300 mg tablet
5 to 6 kg	6 ml x 2	–	–	–
7 to 9 kg	8 ml x 2	–	–	–
10 to 14 kg	12 ml x 2	1 cap x 2	–	–
15 to 19 kg	17 ml x 2	2 cap x 2	–	–
20 to 24 kg	20 ml x 2	2 cap x 2	–	–
25 to 29 kg	25 ml x 2	3 cap x 2	1 cap x 2	1 tab x 2
30 to 39 kg	28 ml x 2	3 cap x 2	1 cap x 2	1 tab x 2
≥ 40 kg	–	3 cap x 2	–	1 tab x 2

Duration
– The duration of treatment depends on the efficacy and tolerance of zidovudine.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe haematological disorders (leukopenia, anaemia), to neonates with hyperbilirubinaemia or raised transaminases.
– May cause: haematological disorders (monitor CBC), gastrointestinal disturbances (nausea, diarrhoea, etc.), headache, myopathy, hepatic disorders, lactic acidosis. Stop taking zidovudine in the event of severe haematological disorders or hepatic disorders (hepatomegaly, raised transaminases).
– Reduce dosage in patients with severe renal or hepatic impairment.
– Do not combine with stavudine.
– *Pregnancy: no contra-indication*
– *Breast-feeding: not recommended*

Remarks
– For prophylactic treatment to reduce mother-to-child transmission, check national recommendations.
– Also comes in fixed-dose combination tablets incorporating zidovudine-lamivudine (Combivir®…) and zidovudine-lamivudine-abacavir (Trizivir®…).
– *Storage: below 30°C. For capsules:*  –

ZIDOVUDINE/LAMIVUDINE = AZT/3TC (Avocomb®, Combivir®, Duovir®…)

Prescription under medical supervision

Therapeutic action
– Combination of 2 antiretrovirals, HIV-1 and HIV-2 nucleoside reverse transcriptase inhibitors

Indications
– HIV-1 or HIV-2 infection, in combination with another antiretroviral drug

Presentation
– 60 mg AZT/30 mg 3TC tablet
– 300 mg AZT/150 mg tablet

Dosage
– Child less than 25 kg: see table below

Weight	60 mg AZT/30 mg 3TC tablet
3 to 5 kg	1 tab x 2
6 to 9 kg	1 1/2 tab x 2
10 to 13 kg	2 tab x 2
14 to 19 kg	2 1/2 tab x 2
20 to 24 kg	3 tab x 2

– Child ≥ 25 kg and adult: one 300 mg AZT/150 mg 3TC tablet twice daily

Duration: depending on the efficacy and tolerance of treatment.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe haematological disorders (neutropenia, anaemia).
– May cause:
  • adverse effects common to all 2 antiretrovirals: gastrointestinal disturbances;
  • adverse effects of zidovudine: see zidovudine;
  • adverse effects of lamivudine: see lamivudine.
– Do not combine with stavudine.
– *Pregnancy: no contra-indication*

Remarks
– *Storage: below 30°C*

ZIDOVUDINE/LAMIVUDINE/NEVIRAPINE = AZT/3TC/NVP (Avocomb N®, Duovir N®…)

Prescription under medical supervision

Therapeutic action
– Combination of 3 antiretrovirals

Indications
– HIV-1 infection

Presentation
– 60 mg AZT/30 mg 3TC/50 mg NVP dispersible tablet
– 300 mg AZT/150 mg 3TC/200 mg NVP tablet

Dosage
– Child less than 25 kg: see table below

Weight	60 mg AZT/30 mg 3TC/50 mg NVP tablet
3 to 5 kg	1 tab x 2
6 to 9 kg	1 1/2 tab x 2
10 to 13 kg	2 tab x 2
14 to 19 kg	2 1/2 tab x 2
20 to 24 kg	3 tab x 2

– Child ≥ 25 kg and adult: one 300 mg AZT/150 mg 3TC/200 mg NVP tablet twice daily

Duration: depending on the efficacy and tolerance of treatment.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe haematological disorders (neutropenia, anaemia), hepatic disorders or intolerance to nevirapine that led to discontinuation of treatment.
– May cause:
  • adverse effects common to all 3 antiretrovirals: gastrointestinal disturbances;
  • adverse effects of zidovudine: see zidovudine;
  • adverse effects of lamivudine: see lamivudine;
  • adverse effects of nevirapine: see nevirapine.
– Monitor if possible liver enzyme level (ALAT) during the first 2 months, then every 6 months. If the enzyme level reaches 5 times the normal level, stop nevirapine immediately.
– Nevirapine reduces the efficacy of oral contraceptives: use a non-hormonal contraception or injectable medroxyprogesterone or make sure that the oral contraceptive used contains 50 µg ethinylestradiol per tablet.
– Do not combine with stavudine or rifampicin.
– *Pregnancy: no contra-indication*

Remarks
– To improve tolerance of NVP, administer half doses for the first 14 days of treatment. Therefore, start triple therapy by using AZT/3TC co-formulations (Avocomb®, Combivir®, Duovir®) and nevirapine tablets (Neravir®, Nevimune®, Viramune®). After the initial 14-day phase of treatment, use the co-formulation AZT/3TC/NVP.
– *Storage: below 30°C*

ZINC SULFATE

Therapeutic action

– Micronutrient

Indications

– Zinc supplementation in combination with oral rehydration therapy in the event of acute and/or persistent diarrhoea in children under 5 years

Presentation

– 20 mg scored and dispersible tablet, packed in a blister
– 20 mg/5 ml syrup

Dosage and duration

– Child under 6 months: 10 mg once daily (1/2 tablet or 1/2 teaspoon once daily) for 10 days
– Child from 6 months to 5 years: 20 mg once daily (1 tablet or 1 teaspoon once daily) for 10 days

Place the half-tablet or full tablet in a teaspoon, add a bit of water to dissolve it, and give the entire spoonful to the child.

Contra-indications, adverse effects, precautions

– No contra-indication.
– If the child vomits within 30 minutes after swallowing the tablet, re-administer the dose.
– Do not give simultaneously with ferrous salts, administer at least 2 hours apart.

Remarks

– Zinc sulfate is given in combination with oral rehydration solution in order to reduce the duration and severity of diarrhoea, as well as to prevent further occurrences in the 2 to 3 months after treatment. Zinc sulfate must never replace oral rehydration therapy which is essential (nor can it replace antibiotic therapy that may, in specific cases, be necessary).
– Zinc supplementation is not recommended in the event of diarrhoea in malnourished children taking therapeutic food (BP100®, Plumpy' nut®, milk F75® or F100®, etc.) as these foods already contain the required amount of zinc.
– *Storage: below 30°C* –  –
Tablets are packed in a blister. Leave tablets in blister until use. Once a tablet is removed from the blister, it must be dissolved and administered immediately.

Injectable drugs

Acetaminophen 195
Adrenaline 168
Albuterol 202
Amoxicillin 147
Amphotericin B 146
Ampicillin 147
Aneurine 206
Artemether 148
Atropine 149
Benzathine benzylpenicillin 150
Benzylpenicillin 151
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AMPHOTERICIN B conventional (Fungizone®…)

Prescription under medical supervision

Therapeutic action
– Antifungal

Indications
– Severe systemic fungal infections: cryptococcosis, histoplasmosis, penicilliosis, etc.

Presentation and route of administration
– Powder for injection, 50 mg vial, to be dissolved in 10 ml of water for injection, to obtain a concentrated solution containing 5 mg/ml. The concentrated solution must be diluted in 490 ml of 5% glucose to obtain 500 ml of 0.1 mg/ml solution, for IV infusion.

Dosage
– Child and adult: initially 0.25 mg/kg over 2 to 6 hours, then increase gradually until reaching the dose of 1 mg/kg/day (up to 1.5 mg/kg daily maximum in very severe infections).
Prior to starting treatment, it is recommended to administer a test-dose (1 mg diluted in 5% glucose and infused over 30 minutes) in order to assess the patient for immediate allergic reaction. The patient's vital signs (temperature, respiratory and pulse rates, blood pressure) are monitored. If no serious adverse reactions occur, the initial dose is administered.

Duration
– 6 to 12 weeks or more. If the treatment is interrupted for longer than 7 days, recommence at initial therapeutic dose and increase gradually.

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe renal impairment or hypersensitivity to amphotericin.
– May cause:
  • fever, chills, headache, allergic reactions (discontinue if a reaction is observed after test-dose),
  • nephrotoxicity,
  • gastrointestinal disturbances, anorexia, muscle or joint pain, blood and cardiovascular disorders, seizures, blurred/double vision,
  • pain and thrombophlebitis at injection site,
  • in the event of rapid intravenous infusion: hypotension, arrhythmia, hypokalaemia, shock.
– Use paracetamol, an antihistamine or hydrocortisone to prevent or treat fever.
– The administration of sodium chloride appears to limit, even prevent, amphotericin nephrotoxicity (administer 1 litre of 0.9% NaCl before the administration of amphotericin).
– Monitor renal function, blood counts and kalaemia throughout treatment.
– Do not combine with drugs inducing *torsades de pointe* (quinidine, erythromycin IV, halofantrine, pentamidine, sotalol, amiodarone, etc.).
– Monitor combination with cardiac glycosides (enhanced digitalis toxicity) and drugs inducing hypokalaemia such as diuretics or corticosteroids.
– *Pregnancy: no contra-indication. When administered during the last month of pregnancy, check for renal dysfunction in the newborn.*
– *Breast-feeding: avoid, except if vital*

Remarks
– Liposomal amphotericin B (AmBisome®), amphotericin B lipid complex (Abelcet®), and amphotericin B colloidal (Amphotec®, Amphocil®) are lipid-based formulations which carry a reduced risk of nephrotoxicity compared to conventional amphotericin B.
– Only use 5% glucose for IV administration (incompatible with other infusion fluids).
– Do not mix with other drugs in the same infusion bottle.
– *Storage:*
  • *Before reconstitution: keep refrigerated (between 2°C and 8°C). In the absence of a refrigerator, the vials of powder may be kept for 7 days maximum, below 25°C.*
  • *After reconstitution: concentrated solution may be kept refrigerated for 24 hours (between 2°C and 8°C); the solution for injection must be used immediately.*

AMPICILLIN (Pentrexyl®…) and AMOXICILLIN (Clamoxyl®…)

Prescription under medical supervision

Therapeutic action
– Penicillin antibacterial

Indications
– Severe infections: pneumonia, meningitis, septicaemia, endocarditis, puerperal fever, pyelonephritis, etc., alone or in combination with other antibacterials, depending on indication, only when oral administration is not possible

Presentation and route of administration
– Powder for injection in 500 mg and 1 g vials, to be dissolved in water for injection, for IM or slow IV injection (over 3 to 5 minutes) or infusion (over 20 to 30 minutes) in 0.9% sodium chloride

Dosage
– The daily dose must be administered in at least 3 injections or infusions, at 8-hour intervals. Injectable ampicillin and injectable amoxicillin are used at the same doses for the same indications:
Child: 100 mg/kg/day in 3 injections or infusions
Adult: 3 to 4 g/day in 3 to 4 injections or infusions

Age	**Weight**	**500 mg vial** (to be dissolved in 5 ml)	**1 g vial** (to be dissolved in 5 ml)
< 1 year	< 8 kg	2 ml x 3	–
1 to 5 years	8 to 15 kg	4 ml x 3	2 ml x 3
5 to 10 years	15 to 25 kg	–	3 ml x 3
			1 g vial
10 to 15 years	25 to 35 kg	–	3/4 to 1 vial x 3
Adults	> 35 kg	–	1 vial x 3

– In the event of *pyelonephritis* or *puerperal fever*, increase dosage:
Child: 200 mg/kg/day in 3 injections or infusions
Adult: 8 g/day in 3 to 4 injections or infusions
– In the event of *meningitis, septicaemia* and *endocarditis*:
Child: 200 mg/kg/day in 3 to 4 injections or infusions or as a continuous infusion
Adult: 12 g/day in 3 to 4 injections or infusions or as a continuous infusion

Duration: according to indication; change to oral treatment as soon as possible

Contra-indications, adverse effects, precautions
– Do not administer to penicillin-allergic patients, patients with infectious mononucleosis.
– Administer with caution to patients allergic to cephalosporins (cross-sensitivity may occur).
– May cause: gastrointestinal disturbances, allergic reactions, sometimes severe. In the event of allergic reaction, stop treatment immediately.
– Reduce dosage in patients with severe renal impairment.
– Do not combine with methotrexate.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Do not mix with another drug in the same in the same syringe or infusion.
– *Storage: below 30°C* –
  • *Ampicillin is stable for 12 hours in 0.9% sodium chloride and for 4 hours in 5% glucose.*
  • *Amoxicillin is stable for 6 hours in 0.9% sodium chloride and for 1 hour in 5% glucose.*

ARTEMETHER
(Paluther®…)

Prescription under medical supervision

Therapeutic action

– Antimalarial

Indications

– Treatment of severe falciparum malaria
– Initial treatment of uncomplicated falciparum malaria, when persistent vomiting precludes oral therapy

Presentation and route of administration

– 80 mg in 1 ml ampoule (80 mg/ml), oily solution for IM injection
– 20 mg in 1 ml ampoule (20 mg/ml), oily solution for IM injection, to be administered with 1 ml syringe graduated in 0.01 ml when the dose required is less than 1 ml.

Dosage and duration

– Child and adult:
3.2 mg/kg by IM injection on the first day followed by 1.6 mg/kg once daily

Weight	20 mg ampoule		80 mg ampoule	
	Loading dose	Maintenance dose	Loading dose	Maintenance dose
< 3 kg	0.5 ml	0.3 ml	–	–
3-4 kg	0.8 ml	0.4 ml	–	–
5-6 kg	1.2 ml	0.6 ml	–	–
7-9 kg	1.6 ml	0.8 ml	–	–
10-14 kg	2.4 ml	1.2 ml	–	–
15-19 kg	3.2 ml	1.6 ml	–	–
20-29 kg	–	–	1.2 ml	0.6 ml
30-39 kg	–	–	1.6 ml	0.8 ml
40-49 kg	–	–	2 ml	1 ml
50-59 kg	–	–	2.4 ml	1.2 ml

As soon as the patient can swallow, change to oral route with an artemisinin-based combination therapy (do not use the combination artesunate-mefloquine if the patient developed neurological signs during the acute phase).

Contra-indications, adverse effects, precautions

– May cause: headache, gastrointestinal disturbances, dizziness, neutropenia and transient increase in liver transaminases.
– Do not administer by IV route.
– *Pregnancy: no contra-indication during the 2nd and 3rd trimester. The safety of artemether in the first trimester has not yet been definitely established. However, given the risks associated with malaria, artemether may be used during the first trimester when the correct administration of quinine cannot be assured.*
– *Breast-feeding: no contra-indication*

Remarks

– *Storage: below 30°C* – 

ATROPINE

Prescription under medical supervision

Therapeutic action

– Parasympatholytic, antispasmodic

Indications

– Premedication in anaesthesia
– Spasms of the gastrointestinal tract
– Organophosphorus pesticide poisoning

Presentation and route of administration

– 1 mg atropine sulfate in 1 ml ampoule (1 mg/ml) for SC, IM, IV injection
Also comes in 0.25 mg/ml and 0.5 mg/ml ampoules.

Dosage

– *Premedication in anaesthesia*
Child: 0.01 to 0.02 mg/kg by SC or IV injection
Adult: 1 mg by SC or IV injection
– *Spasms of the gastrointestinal tract*
Child from 2 to 6 years: 0.25 mg by SC injection as a single dose
Child over 6 years: 0.5 mg by SC injection as a single dose
Adult: 0.25 to 1 mg by SC injection, to be repeated every 6 hours if necessary, without exceeding 2 mg/day.
– *Organophosphorus pesticide poisoning*
Child: 0.02 to 0.05 mg/kg by IM or slow IV injection
Adult: 2 mg by IM or slow IV injection
Repeat every 5 to 10 minutes until signs of atropinisation appear (reduced secretions, tachycardia, dilatation of the pupils).

Contra-indications, adverse effects, precautions

– Do not administer to patients with urethro-prostatic disorders, cardiac disorders, glaucoma.
– Do not administer to children with high fever.
– May cause: urinary retention, dryness of the mouth, constipation, dizziness, headache, dilatation of the pupils, tachycardia.
– Administer with caution and under close supervision to patients taking other anti-cholinergic drugs (antidepressants, neuroleptics, H-1 antihistamines, antiparkinsonians, etc.).
– *Pregnancy: no contra-indication;* NO PROLONGED TREATMENT
– *Breast-feeding: avoid;* NO PROLONGED TREATMENT

Remarks

– Atropine IV is also used to prevent bradycardic effects of neostigmine when used to reverse the effects of competitive muscle relaxants: 0.02 mg/kg in children; 1 mg in adults.
– Do not mix with other drugs in the same syringe.
– *Storage: below 30°C –*

BENZATHINE BENZYLPENICILLIN
(Extencilline®, Penadur®, Penidural®, Penilevel Retard®…)

Prescription under medical supervision

Therapeutic action
– Penicillin antibacterial with prolonged action (15 to 20 days)

Indications
– Treatment of syphilis (except neurosyphilis)
– Treatment of non-venereal treponematoses: bejel, yaws, pinta
– Treatment of streptococcal tonsillitis
– Prophylaxis of rheumatic fever
– Treatment of diphtheria, prophylaxis of diphtheria in the event of direct contact

Presentation and route of administration
– Powder for injection, 2.4 M IU (= 1.44 g) vial, to be dissolved in 8 ml water for injection, for IM injection. NEVER FOR IV INJECTION NOR INFUSION. Shake suspension before administration.

Also comes in 1.2 M IU (= 0.72 g) vial to be dissolved in 4 ml and 0.6 M IU (= 0.36 g) vial to be dissolved in 2 ml.

Dosage and duration
– *Treatment of syphilis*
  Adult: 2.4 MIU. For early syphilis: administer a single dose; for late syphilis: one injection per week for 3 weeks. Divide the dose into 2 injections (half-dose in each buttock).
– *Bejel, yaws, pinta, streptococcal tonsillitis, prophylaxis and treatment of diphtheria*
  Child under 30 kg: 600 000 IU as a single dose
  Child over 30 kg and adult: 1.2 MIU as a single dose
– *Prophylaxis of rheumatic fever*
  Child under 30 kg: 600 000 IU
  Child over 30 kg and adult: 1.2 MIU
  For primary prophylaxis: administer a single dose; for secondary prophylaxis: one injection every 3 to 4 weeks.

Contra-indications, adverse effects, precautions
– Do not administer to penicillin-allergic patients.
– Administer with caution to patients allergic to cephalosporins (cross-sensitivity may occur).
– May cause:
  • gastrointestinal disturbances; allergic reactions, sometimes severe. In the event of allergic reactions, stop treatment immediately,
  • Jarisch-Herxheimer reaction in patients with syphilis (to be prevented with oral prednisolone: 3 doses of 20 mg administered at 12 hour-intervals).
– Ensure that the IM injection does not enter a blood vessel: IV administration may result in cardiorespiratory arrest.
– Do not combine with methotrexate.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Benzathine benzylpenicillin (or penicillin G benzathine) is a penicillin with a long duration of action (15 to 20 days), this must not be confused with benzylpenicillin (or penicillin G) that has a short duration of action (6 hours).
– Benzathine benzylpenicillin should not be used for prevention, except in case of rheumatic fever or diphtheria.
– Do not mix with other drugs in the same syringe.
– *Storage: below 30°C –* 
  Once reconstituted, suspension must be kept refrigerated (2°C to 8°C) and may be used for up to 24 hours.

BENZYLPENICILLIN = PENICILLIN G
(Crystapen®, Penilevel®…)

Prescription under medical supervision

This presentation is rarely used as it requires injections every 4 to 6 hours, which can only be done in a hospital setting.

Therapeutic action

– Penicillin antibacterial with rapid action and elimination (6 hours)

Indications

– Severe infections: pneumonia, neurosyphilis, meningitis, necrotising fasciitis, gas gangrene, septicaemia, endocarditis, etc., alone or in combination with other antibacterials, depending on indication

Presentation and route of administration

– Powder for injection in 1 MIU (600 mg) and 5 MIU (3 g) vials, for IM or IV injection (via the infusion tube) or infusion

Dosage

– *Severe pneumonia*
  Child over 2 months: 200 000 to 400 000 IU (120 to 240 mg)/kg/day in 4 injections
  Adult: 8 to 12 MIU (4.8 to 7.2 g)/day in 4 injections
– *Neurosyphilis*
  Adult: 12 to 24 MIU (7.2 to 14.4 g)/day in 6 injections
– *Meningitis, streptococcal necrotising fasciitis, gas gangrene, anthrax*
  Child: 600 000 IU (360 mg)/kg/day in 6 injections
  Adult: 24 MIU (14.4 g)/day in 6 injections

Duration

– *Pneumonia*: 5 days minimum; *neurosyphilis and meningococcal or pneumococcal meningitis*: 14 days; *fasciitis and gas gangrene*: 7 days minimum; *anthrax*: 7 to 10 days

Contra-indications, adverse effects, precautions

– Do not administer to penicillin-allergic patients.
– Administer with caution to patients allergic to cephalosporins (cross-sensitivity may occur).
– May cause:
  • gastrointestinal disturbances, allergic reactions sometimes severe. In the event of allergic reactions, stop treatment immediately,
  • Jarisch-Herxheimer reaction in patients with syphilis (to be prevented with oral prednisolone: 3 doses of 20 mg administered at 12 hour-intervals),
  • neurotoxicity in patients with renal impairment or when large doses are injected too rapidly by IV route.
– Reduce dosage in patients with severe renal impairment: maximum 10 MIU/day (6 g/day) in adults.
– Do not combine with methotrexate.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Do not confuse rapidly acting benzylpenicillin, which can be used by IV route, with long-acting penicillins (procaine benzylpenicillin and benzathine benzylpenicillin), which must never be used for IV injection or infusion.
– Do not mix with other drugs in the same syringe or infusion.
– *Storage: below 30°C –* 
  Once reconstituted, suspension must be used immediately.

BENZYLPENICILLIN PROCAINE = PENICILLIN G PROCAINE (Depocillin®, Duracillin®…)

Prescription under medical supervision

Therapeutic action
– Penicillin antibacterial with prolonged effect (12 to 24 hours)

Indications
– Diphtheria, pneumonia, erysipelas and cellulitis, cutaneous anthrax
– Neurosyphilis, in combination with probenecid

Presentation and route of administration
– Powder for injection in 1 MIU (1 g) and 3 MIU (3 g) vials, to be dissolved in water for injection, for IM injection. NEVER FOR IV INJECTION OR INFUSION.

Dosage
– Child: 50 000 IU/kg (50 mg/kg) once daily, without exceeding 1.5 MIU
– Adult: 1 to 1.5 MIU once daily

Age	Weight	1 MUI vial	3 MUI vial
< 1 year	< 8 kg	1/4 to 1/2 vial	–
1 to 5 years	8 to 15 kg	2/3 vial	–
5 to 10 years	15 to 25 kg	1 vial	1/3 vial
10 to 15 years	25 to 35 kg	1 vial	1/2 vial
Adult	> 35 kg	1 vial	1/2 vial

Duration
– *Diphtheria*: 7 days; *pneumonia*: 5 days minimum; *anthrax, erysipelas, cellulitis*: 7 to 10 days; *neurosyphilis*: 10 to 14 days

Contra-indications, adverse effects, precautions
– Do not administer to patients allergic to penicillin and/or procaine.
– Administer with caution to patients allergic to cephalosporins (cross-sensitivity may occur).
– Administer with caution to children under one year: risk of seizures and allergy due to procaine.
– May cause:
  • pain at the injection site, gastrointestinal disturbances, allergic reactions sometimes severe. In the event of allergic reactions, stop treatment immediately.
  • Jarisch-Herxheimer reaction in patients with syphilis (to be prevented with oral prednisolone: 3 doses of 20 mg administered at 12 hour-intervals).
– Reduce dosage in patients with severe renal impairment.
– Do not combine with methotrexate.
– Ensure that the IM injection does not enter a blood vessel: IV administration may result in ischemia at the injection site, psychiatric and neurological disorders (agitation, hallucinations, seizures).
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– For the treatment of neurosyphilis, benzylpenicillin procaine is combined with oral probenecid (2 g/day in 4 divided doses at 6-hour intervals) for the entire length of treatment.
– Benzylpenicillin procaine is replaced in some countries by a combination of benzylpenicillin procaine (3 MIU) + benzylpenicillin (1 MIU), often called fortified penicillin procaine (PPF) which has the advantage of the immediate action of benzylpenicillin, followed by the delayed action of benzylpenicillin procaine.
– Do not mix with other drugs in the same syringe.
– *Storage:* 
Once reconstituted, suspension must be used immediately.

BENZYLPENICILLIN PROCAINE + BENZYLPENICILLIN = FORTIFIED PENICILLIN PROCAINE (Bicillin®…)

Prescription under medical supervision

Therapeutic action

– Penicillin antibacterial with both prolonged effect due to procaine benzylpenicillin (12 to 24 hours) and immediate effect due to benzylpenicillin

Indications

– Diphtheria, pneumonia, erysipelas and cellulitis, cutaneous anthrax

Presentation and route of administration

– Powder for injection in 3 MIU benzylpenicillin procaine + 1 MIU benzylpenicillin vial, to be dissolved in 8 ml water for injection, for IM injection. NEVER FOR IV INJECTION OR INFUSION.

Dosage

– Child: 50 000 IU/kg (50 mg/kg) once daily, without exceeding 1.5 MIU
– Adult: 1 to 1.5 MIU once daily

Age	Weight	3 MUI + 1 MUI vial (to be dissolved in 8 ml)
< 1 year	< 8 kg	0.75 ml
1 to 5 years	8 to 15 kg	1.5 ml
5 to 10 years	15 to 25 kg	2.5 ml
10 to 15 years	25 to 35 kg	3 ml
Adult	> 35 kg	3 ml

Duration

– *Diphtheria*: 7 days; *pneumonia*: 5 days minimum; *anthrax, erysipelas, cellulitis*: 7 to 10 days

Contra-indications, adverse effects, precautions

– Do not administer to patients allergic to penicillin and/or procaine.
– Administer with caution to patients allergic to cephalosporins (cross-sensitivity may occur).
– Administer with caution to children under one year: risk of seizures and allergy due to procaine.
– May cause: pain at the injection site, gastrointestinal disturbances, allergic reactions sometimes severe. In the event of allergic reactions, stop treatment immediately.
– Reduce dosage in patients with severe renal impairment.
– Do not combine with methotrexate.
– Ensure that the IM injection does not enter a blood vessel: IV administration may result in ischemia at the injection site, psychiatric and neurological disorders (agitation, hallucinations, seizures).
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Do not mix with other drugs in the same syringe.
– *Storage:*
Once reconstituted, suspension must be used immediately.

BUPIVACAINE
(Carbostesin®, Marcaine®…)

Prescription under medical supervision

Therapeutic action

– Long-acting local anaesthetic
– Anaesthesia is produced within 10 to 30 minutes and lasts for 2 to 4 hours.

Indications

– Local anaesthesia by subcutaneous infiltration
– Regional anaesthesia: peripheral nerve or plexus block, caudal block, epidural block
– Dental anaesthesia
– Epidural anaesthesia in obstetrics

Presentation and route of administration

– 0.25% solution (2.5 mg/ml) and 0.50% solution (5 mg/ml) in 10 ml and 20 ml ampoules

NEVER ADMINISTER BY IV ROUTE.

Dosage

– Child over 12 years and adult: 1.5 mg/kg (0.25% solution: 0.6 ml/kg; 0.50% solution: 0.3 ml/kg)
– Maximum dose in adults: 2 mg/kg for a period of 4 hours

Indication	Concentration	Usual dose for adult
Local anaesthesia	0.25 %	5 to 20 ml depending on surface
Plexus block	0.50 %	20 to 30 ml
Nerve block	0.50 %	up to 20 ml depending on nerve
Epidural block in surgery	0.50 %	12 to 24 ml
Caudal block	0.50 %	15 to 30 ml
Epidural block in obstetrics	0.25 %	18 to 20 ml
Dental anaesthesia	0.50 %	1.8 to 3.6 ml

Caudal and epidural anaesthesia must only be performed by an experienced anesthetist.

Contra-indications, adverse effects, precautions

– Do not administer to patients with known allergy to bupivacaine, impaired atrio-ventricular conduction, uncontrolled epilepsy, porphyria or to patients receiving anticoagulants.
– Do not use in the presence of local infection.
– May cause, especially in case of overdosage: neurological disorders (agitation, dizziness, etc.), cardiovascular disorders and respiratory failure, that must be closely monitored to avoid serious complications (convulsions, apnoea, collapse, etc.). Overdosage may result from an accidental intravascular injection. To avoid accidental injection into the bloodstream, aspirate and, if no blood enters the syringe, inject progressively. Repeat aspirations regularly.
– Administer with caution and reduce doses in epileptics, elderly patients, and those suffering from acute or hepatic diseases.
– Use only if technical equipment for intubation and assisted ventilation is available.
– Correct hypovolaemia before administration of bupivacaine if necessary.
– *Pregnancy: avoid high doses during the third trimester*
– *Breast-feeding: no contra-indication*

Remarks

– Also comes in solution with epinephrine (adrenaline) to be used when a longer duration is required as in peripheral nerve or plexus block. This solution should not be used for epidural and caudal anaesthesia.
– 0.5% bupivacaine in glucose hyperbaric solution also exists. It is used exclusively for spinal anaesthesia.
– *Storage: below 30°C – Do not freeze –*
Do not reuse an open vial.

CALCIUM GLUCONATE

Prescription under medical supervision

Therapeutic action
- Calcium therapy
- Antidote to magnesium sulfate

Indications
- Severe hypocalcaemia (hypocalcaemic tetany, neonatal hypocalcaemia, etc.)
- Symptomatic hypermagnesaemia due to excessive doses of magnesium sulfate

Presentation and route of administration
- 1 g ampoule (100 mg/ml, 10 ml; 10% solution) for slow IV injection or infusion in 5% glucose or 0.9% sodium chloride or Ringer lactate

Also comes in 5 g ampoule (100 mg/ml, 50 ml), 10 g vial (100 mg/ml, 100 ml), 20 g vial (100 mg/ml, 200 ml).

Dosage
- *Severe hypocalcaemia*
  Neonate: 2 ml/kg of a 10% solution by IV infusion over 30 minutes followed by 4 ml/kg of a 10% solution administered by continuous infusion over 24 hours
  Adult: 10 ml by slow IV injection (over at least 5 minutes), either repeated as required, or followed by continuous infusion of 40 ml of a 10% solution over 24 hours
  Change to oral route as soon as possible.
- *Magnesium sulfate intoxication*
  Adult: 10 ml of a 10% solution by slow IV injection (over at least 5 minutes), to be repeated once if necessary

Duration: according to clinical response and plasma-calcium levels

Contra-indications, adverse effects, precautions
- Do not administer to patients with severe renal disease or patients receiving cardiac glycosides.
- Do not administer by IM or SC route (pain and risk of tissue necrosis or abscess formation at injection site, especially in infants and children).
- May cause:
  - tingling sensations, warm flushes, dizziness,
  - tissue necrosis in the event of extravasation,
  - hypercalcaemia in the event of too rapid IV injection or overtreatment. First signs of hypercalcaemia include nausea, vomiting, thirst and polyuria. In severe cases, hypotension, bradycardia, arrhythmia, syncope and cardiac arrest may develop.
- Hypercalcaemia can be confirmed by monitoring of serum-calcium levels and ECG changes. Do not use in prolonged treatment if plasma-calcium levels cannot be monitored.
- The patient should be placed in the horizontal position prior to injection and should remain lying down for 30 to 60 minutes.
- *Pregnancy: no contra-indication*
- *Breast-feeding: no contra-indication*

Remarks
- Calcium gluconate is also administered as adjunctive therapy in insect bites or stings (black widow spider, scorpions) for the management of muscle pain and spasms. Several doses at 4-h intervals may be necessary.
- 1 g of calcium gluconate (2.2 mmol or 4.5 mEq) is equivalent to 89 mg of calcium.
- Calcium gluconate is incompatible with many drugs: do not mix with other drugs in the same syringe or infusion fluid.
- Do not use if a precipitate is present.
- *Storage: below 30°C* – 

CEFTRIAXONE
(Rocephin®…)

Prescription under medical supervision

Therapeutic action

– Third-generation cephalosporin antibacterial

Indications

– Severe infections: septicaemia, pneumonia, meningitis (except *Listeria*), pyelonephritis; acute otitis media (if treatment with amoxicillin fails), etc.
– Gonococcal infections (gonorrhoea, gonococcal conjunctivitis)

Presentation and route of administration

– Powder for injection, 250 mg and 1 g vials, supplied with a specific solvent containing lidocaine, for IM injection
– Powder for injection, 250 mg and 1 g vials, supplied with an ampoule of water for injection, for IV injection and infusion in 5% glucose or 0.9% sodium chloride

Also comes in 500 mg and 2 g vials.

Warning: once reconstituted with the solvent containing lidocaine, the solution can only be used by IM injection. NEVER BY IV INJECTION OR INFUSION.

Dosage and duration

– *Severe infections*
  Neonate: 50 mg/kg once daily by infusion over 60 minutes
  Child: 50 to 80 mg/kg once daily by IM, or slow IV injection over 3 minutes, or by infusion over 30 minutes; for meningitis: 100 mg/kg once daily by IM injection
  Adult: 1 to 2 g once daily by IM (1 g in each buttock if the dose is 2 g), or slow IV injection over 3 minutes, or infusion over 30 minutes
  Duration varies according to indication and clinical response. For meningitis in a non-epidemic context: 5 to 7 days.
– *Meningococcal meningitis in an epidemic context*
  Child and adult: 100 mg/kg IM as a single dose, maximum 4 g. If there is no clinical improvement after 24-48 hours, administer a second dose.
– *Gonorrhoea, gonococcal conjunctivitis*
  Neonate: 50 mg/kg IM as a single dose, maximum 125 mg
  Child and adult: 125 mg IM as a single dose

Contra-indications, adverse effects, precautions

– Do not administer to patients with allergy to cephalosporins; to neonates with jaundice (risk of bilirubin encephalopathy).
– Administer with caution to penicillin-allergic patients (cross-sensitivity may occur).
– May cause: gastrointestinal disturbances, allergic reactions sometimes severe (Stevens-Johnson syndrome), hepatic dysfunction; rarely: pancreatitis, blood disorders (anaemia, leucopenia, thrombocytopenia), renal dysfunction.
– In the event of allergic reactions, stop treatment immediately.
– Reduce dosage in patients with hepatic or renal impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– For the treatment of gonorrhoea, preferably use cefixime (400 mg as a single dose).
– Do not mix with other drugs in the same syringe; do not add to solutions containing calcium (Ringer or Hartmann).
– *Storage: below 30°C –* 
  Once reconstituted, solution keeps 6 hours, at a temperature below 25°C.

CHLORAMPHENICOL
(Chloromycetin®, Kemicetine®…)

Prescription under medical supervision

Therapeutic action
– Antibacterial

Indications
– Severe infections: meningitis, septicaemia, typhoid fever, pneumonia, plague, etc., only when oral administration is not possible

Presentation and route of administration
– Powder for injection in 1 g vial, to be dissolved in water for injection, for IM or IV injection (over 1 to 2 minutes)

Dosage
– Child from 2 weeks to 1 year: 50 mg/kg/day in 3 to 4 injections
– Child over 1 year: 50 to 100 mg/kg/day in 3 to 4 injections
– Adult: 3 to 4 g/day in 3 to 4 injections

Age	**Weight**	**1 g vial** (to be dissolved in 10 ml)
< 2 weeks		Avoid
< 1 year	< 8 kg	1 to 2 ml x 3
1 to 5 years	8 to 15 kg	2 to 4 ml x 3
5 to 10 years	15 to 25 kg	4 to 5 ml x 3
		1 g vial
10 to 15 years	25 to 35 kg	1/2 to 1 vial x 3
Adults	> 35 kg	1 vial x 3

Duration : according to indication; change to oral treatment as soon as possible

Contra-indications, adverse effects, precautions
– Do not administer to premature infants; avoid in newborns and children under 2 months (if there is no alternative, dosage is 25 mg/kg/day in 3 injections).
– Do not administer to patients with a history of previous allergic reaction and/or toxic reaction to chloramphenicol, G6PD deficiency.
– Reduce dosage in patients with hepatic or renal impairment.
– May cause:
  • gastrointestinal disorders,
  • allergic reactions, dose related and reversible marrow depression (anaemia, leucopenia, thrombocytopenia): if so, stop treatment,
  • grey syndrome in premature infants and neonates (vomiting, hypothermia, blue-grey skin colour and cardiovascular depression), irreversible aplastic anaemia.
– *Pregnancy*: **CONTRA-INDICATED**, *except if vital, if there is no therapeutic alternative. If used during the 3rd trimester, risk of grey syndrome in the newborn infant.*
– *Breast-feeding*: **CONTRA-INDICATED**

Remarks
– Due to its potential haematotoxicity, the use of chloramphenicol should be restricted to severe infections when other less toxic antibiotics are not effective or are contra-indicated.
– Oral treatment is more effective than parenteral treatment: blood and tissue concentrations are higher when chloramphenicol is given orally.
– *Storage: below 30°C* –

Long-acting oily CHLORAMPHENICOL

Prescription under medical supervision

Therapeutic action

– Antibacterial with prolonged effect

Indications

– Treatment of meningococcal meningitis during epidemics

Presentation and route of administration

– 500 mg ampoule (250 mg/ml, 2 ml), oily suspension for IM injection only, NEVER FOR IV INJECTION.

Dosage

– Child over 1 year and adult: 100 mg/kg/injection, without exceeding 3 g/injection

Age	**1 year**	**2 years**	**6 years**	**10 years**	**15 years and adults**
Dose	do not administer	1 g	1.5 g	2 g	2.5 g	3 g

– If necessary, administer half the dose into each buttock.

Duration

– Single dose. If there is no improvement after 24 hours, a second dose may be administered.

Contra-indications, adverse effects, precautions

– Do not combine with other antibacterials.
– May cause: gastrointestinal disturbances, allergic reactions, anaemia, leucopenia, thrombocytopenia.
– Shake suspension before use.
– *Pregnancy*: ***CONTRA-INDICATED***
– *Breast-feeding*: ***CONTRA-INDICATED***

Remarks

– Oily chloramphenicol is not recommended as chemoprophylaxis for meningitis contacts during epidemics. All suspected cases must be examined at the first signs of the disease.
– *Storage: below 30°C* –

CHLOROQUINE
(Nivaquine®…)

Prescription under medical supervision

The use of injectable chloroquine is not recommended:
- **in the event of severe malaria, use injectable quinine, artemether or artesunate,**
- **in the event of uncomplicated malaria *sensitive to chloroquine*, use chloroquine by oral route.**

Therapeutic action
- Antimalarial

Indications
- Treatment of malaria sensitive to chloroquine, only when oral administration is not possible (vomiting)

Presentation and route of administration
- 200 mg base ampoule (40 mg base/ml, 5 ml) for IM injection (in the tight), SC injection or slow infusion. NEVER FOR IV INJECTION.

Dosage and duration
- Child and adult:
  - slow infusion at constant rate: 10 mg base/kg over 8 hours, then 5 mg base/kg over 8 hours, every 8 hours
  - IM or SC: 3.5 mg base/kg every 6 hours

Do not administer the entire treatment parenterally. As soon as the patient can swallow, change to oral route. The total dose administered over the entire course of treatment must not exceed 25 mg base/kg.

Contra-indications, adverse effects, precautions
- Do not administer to patients with retinopathy.
- Avoid IM route in children under 5 years.
- There is a narrow margin between the therapeutic and toxic dose. Check that the patient has not taken chloroquine in the preceding days.
- May cause: gastrointestinal disturbances, headache, allergic reactions (urticaria, angioedema), visual disturbances; cardiorespiratory arrest if injected rapidly by IV route or in the event of overdose.
- Do not combine with: coartemether, quinine, mefloquine, halofantrine.
- *Pregnancy: no contra-indication*
- *Breast-feeding: no contra-indication*

Remarks
- Caution: the therapeutic oral dose of chloroquine is equivalent to a toxic dose when given parenterally.
- *P. falciparum* is sensitive to chloroquine in Central America, Haiti and Dominican Republic only.
- Resistance of *P. vivax* to chloroquine exists in Papua New Guinea, Indonesia and Myanmar.
- *Storage:* 

CHLORPROMAZINE
(Largactil®…)

Prescription under medical supervision

Therapeutic action

– Sedative and anti-emetic neuroleptic

Indications

– Acute psychosis, agitation, agressiveness, severe anxiety not controlled by other anxiolytics
– Very severe vomiting, intractable hiccup

Presentation and route of administration

– 50 mg in 2 ml ampoule (25 mg/ml) for deep IM injection or infusion

Also comes in 5 ml ampoule containing 25 mg (5 mg/ml).

Dosage

Varies from one person to another:

– Child: 0.5 mg/kg/injection, do not exceed 75 mg/day
– Adult: 25 to 50 mg/injection, do not exceed 150 mg/day

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
25 mg/ml ampoule			0.2 ml	0.5 ml	1 to 2 ml	
	Repeat 4 hours after the first injection, then every 8 hours if necessary					

– Do not exceed indicated dose.

Duration

– According to indication and clinical response; several days of treatment are sometimes needed for severly agitated patients.

Contra-indications, adverse effects, precautions

– Stop treatment if patient becomes febrile (possible neuroleptic malignant syndrome).
– May cause: extrapyramidal disorders in case of prolonged treatment; hypotension orthostatic.
– Risk of increased sedation when combined with alcohol and drugs acting on the central nervous system such as diazepam, phenobarbital, chlorphenamine.
– *Pregnancy: avoid prolonged use*
– *Breast-feeding: avoid*

Remarks

– *Storage: below 30°C –*

CLINDAMYCIN
(Dalacin®…)

Prescription under medical supervision

Therapeutic action
– Lincosamide antibacterial

Indications
– Second-line treatment of pneumocystosis, *in combination with primaquine*
– Second-line treatment of cerebral toxoplasmosis, *in combination with pyrimethamine*

Presentation and route of administration
– 300 mg ampoule (150 mg/ml, 2 ml), to be diluted in 5% glucose or 0.9% sodium chloride or Ringer Lactate, for infusion only. NEVER FOR IV INJECTION.

Dosage
– Adult: 2400 mg/day in 4 divided doses administered at 6-hour intervals

Duration
– Change to oral route as soon as possible. The total duration of treatment is 21 days for pneumocystosis and 6 weeks for toxoplasmosis.

Contra-indications, adverse effects, precautions
– Do not administer to patients with allergy to lincosamides or history of pseudo-membranous colitis.
– May cause: diarrhoea (including severe: pseudomembranous colitis), nausea, rash, jaundice; allergic reactions sometimes severe.
– In the event of allergic reactions, stop treatment immediately. If pseudomembranous colitis develops (mucus and false membranes), stop clindamycin and treat for *C. difficile* disease (oral metronidazole).
– Do not combine with: erythromycin and neuromuscular blocking drugs.
– Reduce dosage in patients with hepatic impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: administer only if there is no therapeutic alternative. Check infant's stools (risk of colitis).*

Remarks
– Do not mix with other drugs in the same infusion bottle.
– *Storage: below 30°C –*

CLOXACILLIN
(Cloxapen®, Orbenin®…)

Prescription under medical supervision

Therapeutic action

– Penicillin antibacterial active against penicillinase-producing staphylococci

Indications

– Severe infections due to staphylococci resistant to penicillin: staphylococcal pneumonia, pyomyositis, septicaemia, endocarditis, etc.

Presentation and route of administration

– Powder for injection, 500 mg vial, for IM or slow IV injection or infusion (over 60 minutes) in 5% glucose or 0.9% sodium chloride

Also comes in 1 g vial.

Dosage

– Child under 2 years: 1 to 2 g/day in 4 divided doses at 6-hour intervals
– Child from 2 to 10 years: 2 to 4 g/day in 4 divided doses at 6-hour intervals
– Adult: 4 to 8 g/day in 4 divided doses at 6-hour intervals

Age	Child < 2 years	Child from 2 to 10 years	Child > 10 years and adult
500 mg vial	1/2 to 1 vial x 4	1 to 2 vials x 4	2 to 4 vials x 4
1 g vial	1/4 to 1/2 vial x 4	1/2 to 1 vial x 4	1 to 2 vials x 4

Duration

– Depending on indication. Change to oral treatment as soon as possible.

Contra-indications, adverse effects, precautions

– Do not administer to penicillin-allergic patients.
– Administer with caution to patients allergic to cephalosporins (cross-sensitivity may occur).
– May cause: gastrointestinal disturbances, allergic reactions sometimes severe. In the event of allergic reactions, stop treatment immediately.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Dicloxacillin (Diclocil®, etc.), flucloxacillin (Floxapen®, etc.) and oxacillin (Bristopen®, etc.) are used for the same indications and at the same dosage.
– Do not mix with other drugs in the same syringe or infusion.
– *Storage:* 
Reconstituted solution must be used immediately.

DEXAMETHASONE

Prescription under medical supervision

Therapeutic action

– Corticosteroid

Indications

– Inflammatory syndrome in severe infections: severe typhoid fever, acute subglottic laryngitis, etc.
– Foetal lung maturation, in the event of threatened premature delivery before 34 weeks of gestation

Presentation and route of administration

– 4 mg dexamethasone phosphate in 1 ml ampoule (4 mg/ml) for IM or IV injection or infusion

Dosage and duration

– *Inflammatory syndrome in severe infections*
  Dosage and duration vary according to severity and clinical response:
  Child: 0.2 to 0.4 mg/kg/day
  Adult: initial dose of 0.5 to 24 mg/day
– *Foetal lung maturation*
  Administer to the mother: 6 mg by IM injection every 12 hours for 2 days (total dose: 24 mg)

Contra-indications, adverse effects, precautions

– For systemic infections, only administer if patient is under antibiotic treatment.
– In the event of treatment longer than 10 days, decrease doses gradually to avoid adrenal gland failure.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Foetal lung maturation:
  • after 34 weeks of gestation, corticosteroid treatment is not indicated;
  • dexamethasone may be replaced by betamethasone (Betnesol®): 2 doses of 12 mg by IM injection at 24-hour interval (total dose: 24 mg).
– For allergic reactions (Quinke's oedema, anaphylactic shock) and status asthmaticus, use hydrocortisone.
– Dexamethasone acetate (Dectancyl®), insoluble in water, is a suspension used only for local treatment: intra-articular or peri-articular injection, epidural injection (sciatica).
– *Storage: below 25°C –*
  The solution precipitates at 0°C, it must not be exposed to cold temperatures.

DIAZEPAM
(Valium®…)

Prescription under medical supervision

Use IV route only if technical equipment for ventilation is available at hand.

Therapeutic action

– Anxiolytic, sedative, anticonvulsant, muscle relaxant

Indications

– Seizures
– Tetanus
– Agitation associated with anxiety or confusion (delirium tremens), when oral administration is not possible

Presentation and route of administration

– 10 mg ampoule (5 mg/ml, 2 ml) for IM or very slow IV injection or infusion
– Injectable solution may be used by oral and rectal route.
– For rectal or IV administration, dilute 2 ml (10 mg) of diazepam in 8 ml of 5% glucose or 0.9% sodium chloride.
– For rectal administration, use a syringe without a needle, or better, cut a nasogastric tube, CH8, to a length of 2-3 cm and attach it to the tip of the syringe.

Dosage and duration

– *Seizures*
  Child: 0.5 mg/kg rectally or 0.3 mg/kg by slow IV injection, without exceeding 10 mg
  Adult: 10 mg rectally or by slow IV injection
  If seizures do not stop within 5 minutes after the first dose, repeat once.
– *Tetanus*
  The dosage range is variable, depending on severity. For information:
  Child and adult: 0.1 to 0.3 mg/kg by slow IV injection, to be repeated every 1 to 4 hours, under close medical supervision
– *Agitation, delirium tremens*
  Adult: 5 to 10 mg by IM injection, to be repeated after one hour if necessary

Contra-indications, adverse effects, precautions

– Do not administer to patients with severe respiratory insufficiency or severe hepatic impairment.
– May cause:
  • pain at the IV or IM injection site,
  • hypotension, respiratory depression, particularly if administered IV, if injected too rapidly by IV route and if large doses are administered (tetanus),
  • in the event overdose: hypotonia, lethargy, respiratory distress, coma.
– Reduce the dose by one half in elderly patients and patients with renal or hepatic impairment.
– Risk of increased sedation when combined with alcohol and drugs acting on the central nervous system: opioid analgesics, neuroleptics (chlorpromazine, haloperidol, etc.), antihistamines (chlorphenamine, promethazine), antidepressants (clomipramine, fluoxetine, etc.), phenobarbital, etc.
– *Pregnancy: avoid if possible, except if vital*
– *Breast-feeding: avoid*

Remarks

– Diazepam is subject to international controls: follow national regulations.
– Diluted solution is normally cloudy.
– Do not mix with other drugs in the same syringe or infusion.
– *Storage: below 30°C* – 

DICLOFENAC
(Cataflam®, Voltaren®, Voltarol®…)

Prescription under medical supervision

Therapeutic action
– Non-steroidal anti-inflammatory drug, analgesic, antipyretic

Indications
– Moderate pain, particularly due to inflammation (acute sciatic neuralgia, renal colic, post-operative pain etc.)

Presentation and route of administration
– 75 mg in 3 ml ampoule (25 mg/ml) for deep IM injection or infusion

Dosage
– Adult : 75 mg by deep IM injection; combine with 50 mg by oral route if necessary
– For postoperative pain, may be administered by infusion: 75 mg over 30 to 120 minutes; to be repeated after 4 to 6 hours if necessary.
  Maximum dose: 150 mg/day

Duration: maximum 2 to 3 days; change to oral treatment as soon as possible.

Contra-indications, adverse effects, precautions
– Do not administer in case of:
  • renal impairment, uncorrected dehydration or hypovolaemia, severe malnutrition,
  • peptic ulcer,
  • hypersensitivity to other NSAID (aspirin, ibuprofen, indometacin etc.), hepatic impairment, severe infection,
  • coagulation defects, surgery with risk of major blood loss.
– May cause: renal impairment, gastrointestinal disturbances, allergic reactions (rash, eczema, bronchospasm).
– Administer with caution to elderly or asthmatic patients.
– Do not combine with other NSAID (aspirin, ibuprofen, indometacin etc.), diuretics, anti-coagulants.
– *Pregnancy*: **CONTRA-INDICATED**
– *Breast-feeding*: **CONTRA-INDICATED**

Remarks
– For infusion, use a solution of 5% glucose or 0.9% sodium chloride and add 0.5 ml of 8.4% sodium bicarbonate per 500 ml.
– Diclofenac is not included in the WHO list of essential drugs.
– *Storage: below 30°C* –

DIGOXIN
(Coragoxine®, Lanoxin®…)

Prescription under medical supervision

Therapeutic action
– Cardiotonic

Indications
– Supraventricular arrhythmias (fibrillation, flutter, paroxysmal tachycardia)
– Heart failure

Presentation and route of administration
– 500 µg ampoule (250 µg/ml, 2 ml) for slow IV injection or infusion in 5% glucose or 0.9% sodium chloride

Dosage
– Adult:
  • loading dose: 500 to 1000 µg
    The loading dose can be administered either by intravenous infusion as a single dose given over 2 hours minimum or in divided doses, by slow IV injections over 5 minutes minimum.
  • maintenance dose: change to oral treatment
– Reduce the dose by one half in elderly patients and in patients with renal impairment.

Contra-indications, adverse effects, precautions
– Do not administer to patients with bradycardia, ill defined arrhythmia, coronary artery disease.
– It is essential to monitor pulse in the initial stage of treatment.
– Narrow margin between therapeutic and toxic dose.
– May cause in the event of overdose: gastrointestinal disturbances (nausea, vomiting, diarrhoea), blurred vision, headache, confusion, conduction and rhythm disorders. If so, reduce dose or stop treatment.
– Do not combine with calcium, particularly by IV route (serious arrhythmias).
– Monitor combination with:
  • amiodarone, macrolides, itraconazole, quinine, chloroquine (increased digoxin concentration),
  • potassium-depleting drugs: diuretics, corticoids, amphotericin B (increased risk of digoxin toxicity).
– Monitor if possible serum potassium level in patients taking potassium-depleting drugs and serum creatinine level in patients with renal impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– A loading dose may be administered in arrhythmias if a rapid digitalisation is required. It is usually not required for heart failure.
– *Storage: below 30°C* –

EFLORNITHINE
(Ornidyl®…)

Prescription under medical supervision

Therapeutic action
– Trypanocide

Indications
– Meningoencephalitic stage of African trypanosomiasis due to *T. b. gambiense*

Presentation and route of administration
– 20 g in 100 ml ampoule (200 mg/ml) to be diluted in 250 ml of 0.9% sodium chloride, for IV infusion administered over 2 hours

Dosage and duration
– Child under 12 years: 600 mg/kg/day in 4 divided infusions administered at 6-hour intervals for 14 days
– Adult: 400 mg/kg/day in 4 divided infusions administered at 6-hour intervals for 14 days

Contra-indications, adverse effects, precautions
– May cause: haematological disorders (anaemia, leucopenia, thrombocytopenia), gastro-intestinal disturbances (diarrhoea, abdominal pain, vomiting), seizures, tremor, fever, deep tissue infection, gastrointestinal bleeding, chest pain, headache, alopecia, mouth ulcers, dizziness, insomnia, psychosis, hallucinations, hearing impairment.
– The catheter must be handled with great attention to avoid local or general bacterial super-infections: thoroughly disinfect the insertion site, protect the site with a sterile dressing, ensure secure catheter fixation, change the catheter every 48 hours or earlier in the event of phlebitis.
– It is recommended to monitor blood counts, including platelet counts, before treatment, twice weekly during therapy and once weekly after therapy, until the patient's haematologic status returns to normal.
– *Pregnancy*: **CONTRA-INDICATED**

Remarks
– Eflornithine is also called difluoromethylornithine or DFMO.
– *Storage: below 30°C –*
Diluted solution must be kept refrigerated (2°C to 8°C) and used within 24 hours.

EPHEDRINE

Prescription under medical supervision

Therapeutic action

– Sympathomimetic

Indications

– Hypotension induced by regional anaesthesia (spinal and epidural anaesthesia)
– First choice treatment of anaphylactic shock in pregnant women

Presentation and route of administration

– 30 mg in 1 ml ampoule (30 mg/ml) for IV injection
Also comes in 1 ml ampoule containing 50 mg (50 mg/ml).

Dosage

– Dilute 1 ampoule of 30 mg in 9 ml of water for injection to obtain a solution containing 3 mg ephedrine per ml.
– Adult: 3 to 6 mg by slow IV injection (1 to 2 ml of the diluted solution), to be repeated every minutes until blood pressure stabilizes

Duration: according to clinical response

Contra-indications, adverse effects, precautions

– Administer with caution to patients with coronary insufficiency, hyperthyroidism, closed-angle glaucoma.
– May cause: arrhythmia, hypertension.
– *Pregnancy: no contra-indication*
– *Breast-feeding: avoid (excreted in milk)*

Remarks

– For the treatment of anaphylactic shock in pregnant women, ephedrine is preferred over epinephrine to avoid placental vasoconstriction. However, if ephedrine is not immediately effective, use epinephrine (adrenaline).
– Ephedrine has a less potent but more prolonged action than epinephrine (adrenaline).
– Ephedrine has been used in the treatment of asthma but more selective sympathomimetics such as salbutamol are preferred.
– In some countries, ephedrine is a controlled substance: follow national regulations.
– *Storage: below 30°C* –

EPINEPHRINE = EPN = ADRENALINE

Prescription under medical supervision

Therapeutic action

– Sympathomimetic

Indications

– Anaphylactic shock
– Cardiopulmonary arrest

Presentation and route of administration

– 1 mg in 1 ml ampoule (1 mg/ml = 1:1000) for IM or IV injection

Also comes in 1 ml ampoule containing 0.25 mg.

Dosage

– *Anaphylactic shock*

IM epinephrine is the first line treatment (anterolateral part of the thigh), *however* use IV epinephrine in patients with circulatory collapse or those who deteriorate despite receiving IM epinephrine.

- IM treatment

  Use *undiluted* solution (1:1000 = 1 mg/ml) and a 1 ml syringe graduated in 0.01 ml:
  Child from 6 months to 6 years: 0.12 ml
  Child from 6 to 12 years: 0.25 ml
  Child over 12 years and adult: 0.5 ml

  In children, if 1 ml syringe is not available, use a *diluted* solution, i.e. add 1 mg EPN to 9 ml of 0.9% sodium chloride to obtain a 0.1 mg/ml solution (1:10 000):
  Child from 6 months to 6 years: 1.2 ml
  Child from 6 to 12 years: 2.5 ml

  Repeat after 5 minutes if no clinical improvement.

- IV treatment

  Use a *diluted* solution, i.e. add 1 mg EPN to 9 ml of 0.9% sodium chloride to obtain a 0.1 mg/ml solution (1:10 000):
  Child: 0.1 ml/kg (0.01 mg/kg) administered over several minutes
  Adult: 1 to 2 ml (0.1 to 0.2 mg), to be repeated every 1 to 2 minutes, until improvement occurs

– *Cardiopulmonary arrest*

Use a *diluted* solution, i.e. add 1 mg EPN to 9 ml of 0.9% sodium chloride to obtain a 0.1 mg/ml solution (1:10 000):
Child: 0.1 ml/kg (0.01 mg/kg), to be repeated every 3 to 5 minutes, until improvement occurs
Adult: 10 ml (1 mg), to be repeated every 3 to 5 minutes, until improvement occurs

Contra-indications, adverse effects, precautions

– Administer with caution to patients with hypertension, angina, ischaemic heart disease, hyperthyroidism and to elderly patients.
– Do not exceed indicated dose: risk of arrhythmia.
– *Pregnancy: for the treatment of anaphylactic shock in pregnant women, ephedrine is preferred over epinephrine, however, if ephedrine is not immediately effective, use epinephrine.*
– *Breast-feeding: no contra-indication*

Remarks

– For hypotension induced by spinal anaesthesia (unresponsive to ephedrine), administer 0.1 to 0.2 mg of epinephrine IV, every minute, until blood pressure stabilizes.
– Epinephrine is colourless; discard any ampoules with a pink or brownish colour.
– *Storage:* 

ERGOMETRINE (Ergotrate®…) and METHYLERGOMETRINE (Methergin®…)

Prescription under medical supervision

Therapeutic action

– Uterine stimulant

Indications

– Postpartum or postabortal haemorrhage caused by uterine atony (preferably use oxytocin for this indication)

Presentation and route of administration

– Ergometrine maleate: 500 µg in 1 ml ampoule (500 µg/ml), for IM injection
– Methylergometrine maleate: 200 µg in 1 ml ampoule (200 µg/ml), for IM injection

Dosage

– Ergometrine maleate: 250 µg to 500 µg/injection
– Methylergometrine maleate: 200 µg/injection

To be repeated every 2 to 4 hours if necessary, without exceeding a total of 5 injections.

Contra-indications, adverse effects, precautions

– Do not administer during delivery; do not use to induce or facilitate labour.
– Do not administer to patients with hypersensitivity to ergot derivatives (cabergoline, bromocriptine, ergotamine, etc.), severe hypertension, pre-eclampsia, eclampsia, septicaemia.
– Before administration always check:
  • that expulsion of the placenta is complete,
  • that there is no multiple pregnancy. Do not use before the birth of the last child.
– May cause: gastrointestinal disturbances, headache, paraesthesia, confusion, dizziness, tinnitus, hypertension, peripheral vasoconstriction, chest pain.
– Do not combine with another ergot derivative.
– Monitor combination with: metronidazole, azole antifungals, macrolides, protease inhibitors, efavirenz, fluoxetine (risk of ergotism).
– Exceptionally, for extensive uterine bleeding and if oxytocin is not available, ergometrine and methylergometrine may be used by IV route, slowly over a period of no less than one minute, with careful monitoring of blood pressure (risk of sudden hypertensive accidents).
– *Pregnancy*: ***CONTRA-INDICATED***
– *Breast-feeding*: *avoid, except if clearly needed*

Remarks

– Do not confuse with dihydroergotamine, a related drug used for totally different indications.
– Ergometrine is also called ergonovine or ergobasine.
– *Storage: to be kept refrigerated (2°C to 8°C). Do not freeze –*
  • *Expiry date indicated on the label is only valid if stored under refrigeration and protected from light.*
  • *If refrigeration is not available, vials can be kept for one month on condition that they are protected from light and the temperature remains under 30°C.*
  • *Exposure to heat and especially light causes the deterioration of the active ingredients and thus loss of efficacy. Methylergometrine is as sensitive as ergometrine.*
  • *The solution must be colourless. Discolouration indicated a deterioration of the active ingredients. Never use a coloured solution.*

ETONOGESTREL subdermal implant (Implanon®…)

Prescription under medical supervision

Therapeutic action

– Hormonal contraceptive, progestogen

Presentation and route of administration

– Flexible rod containing 68 mg of etonogestrel, in a sterile disposable applicator, to be inserted subdermally into the inner side of the non-dominant arm, 6 to 8 cm above the elbow crease, under local anaesthesia and aseptic conditions.

Indications

Long-term contraception:

– *If no current contraception, the implant is inserted:*
during the first 5 days of menstruation
or immediately after abortion
or after childbirth:
  • if the woman breastfeeds: as of the sixth week postpartum
  • if the woman does not breastfeed: as of the 21st day postpartum

However, if there is a risk that the woman may be lost to follow-up, the implant may be inserted whenever, even after childbirth, whether she breastfeeds or not.

– *When switching from another contraceptive method, the implant is inserted:*
for an oral estroprogestogen: the day after taking the last active tablet in the pack
for an oral progestogen: at any stage of the cycle
for an injectable progestogen: the day the next injection is due
for an intrauterine device: the day of its removal

Duration

– The implant slowly releases a low dose of etonogestrel. It is left inserted, as long as contraception is desired and it is well tolerated, for a maximum of 3 years (2 years in obese women) after which it no longer provides contraception and must be changed.

Contra-indications, adverse effects, precautions

– Do not use in patients with breast cancer, severe or recent liver disease, unexplained vaginal bleeding or current thromboembolic disorders.
– May cause: headache, acne, menstrual irregularities, amenorrhoea, menometrorrhagia, breast tenderness, weight gain, mood changes, abdominal pain, gastrointestinal disturbances, itching, allergic reaction.
– Hepatic enzyme inducers (rifampicin, rifabutin, nevirapine, nelfinavir, ritonavir, phenobarbital, phenytoin, carbamazepine, griseofulvin, etc.) may reduce the contraceptive efficacy. Use a non-hormonal contraceptive method (copper intrauterine device, condoms) or an oral contraceptive containing 50 µg ethinylestradiol (however there is still a risk of contraceptive failure and the risk of adverse effects is increased) or injectable medroxyprogesterone.
– Do not insert the implant deeply as the removal can be difficult later on. It should be palpable under the skin. Read carefully manufacturer's instructions.
– Remove the implant under local anaesthesia and aseptic conditions, using a forceps, after incision with scalpel.
– *Pregnancy*: ***CONTRA-INDICATED***

Remarks

– Implants provide long term contraception, their efficacy is not conditioned by observance. Fertility returns rapidly after removal of the implant.
– *Storage: below 30°C* –

FUROSEMIDE = FRUSEMIDE
(Lasilix®, Lasix®, Seguril®…)

Prescription under medical supervision

Therapeutic action
– Diuretic

Indications
– Emergency treatment of:
  • Oedema caused by renal, hepatic or congestive heart failure
  • Hypertensive crisis (except that of pregnancy)
  • Pulmonary oedema

Presentation and route of administration
– 20 mg in 2 ml ampoule (10 mg/ml) for IM or slow IV injection

Dosage
– Child: 0.5 to 1 mg/kg/injection
– Adult: 20 to 40 mg/injection

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
10 mg/ml ampoule	0.2 ml	0.3 ml	0.75 ml	1.5 ml	2 to 4 ml	
	Repeat after 2 hours if necessary					

– *For pulmonary oedema:* if an initial IV injection of 40 mg does not produce a satisfactory response within one hour, the dose may be increased to 80 mg by slow IV injection.

Duration
– According to clinical response;
– If prolonged use is required, change to oral treatment 3 hours after the last injection.

Contra-indications, adverse effects, precautions
– Do not administer in other types of oedema, especially those due to kwashiorkor.
– Do not administer in case of hepatic encephalopathy.
– May cause: hypokalaemia, especially in cases of cirrhosis, denutrition, congestive heart failure.
– Closely monitor combination with digoxin (furosemide enhances toxicity of digoxin).
– *Pregnancy: CONTRA-INDICATED to treat hypertension in pregnancy*
– *Breast-feeding: avoid (excreted in milk and may reduce milk production)*

Remarks
– If doses greater than 50 mg are required, it is recommended that they be given by IV infusion.
– *Storage: below 30°C –* 

GENTAMICIN
(Genticin®…)

Prescription under medical supervision

Therapeutic action
– Aminoglycoside antibacterial

Indications
– Severe infections (endocarditis, septicaemia, peritonitis, pyelonephritis, etc.), in combination with another antibacterial

Presentation and route of administration
– 20 mg ampoule (10 mg/ml, 2 ml) and 80 mg ampoule (40 mg/ml, 2 ml) for IM or slow IV injection or infusion

Also comes in 10 mg ampoule (10 mg/ml, 1 ml), 40 mg ampoule (40 mg/ml, 1 ml), 40 mg ampoule (20 mg/ml, 2 ml) and 160 mg ampoule (80 mg/ml, 2 ml).

Dosage
– Child and adult: 3 to 6 mg/kg/day
The daily dose in usually administered in 2 injections. For treatments shorter than 7 days, the daily dose may be given in a single injection.

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
20 mg ampoule (10 mg/ml, 2 ml)	1 ml x 2	1.5 ml x 2	3 ml x 2	–	–	
40 mg ampoule (20 mg/ml, 2 ml)	0.5 ml x 2	0.75 ml x 2	1.5 ml x 2	3 ml x 2	–	
80 mg ampoule (40 mg/ml, 2 ml)	0.2 ml x 2	0.4 ml x 2	0.75 ml x 2	1.5 ml x 2	3 ml x 2	
160 mg ampoule (80 mg/ml, 2 ml)	–	–	0.4 ml x 2	0.75 ml x 2	1.5 ml x 2	

Duration
– According to indication and clinical response. Given the risk of renal and auditory toxicity, do not prolong treatment unnecessarily.

Contra-indications, adverse effects, precautions
– Do not administer to patients with allergy to gentamicin or another aminoglycoside.
– Administer with caution to patients with renal impairment, auditory and vestibular damage; reduce dosage in patients with renal impairment (1 mg/kg/day).
– May cause: renal impairment, auditory and vestibular damage, allergic reactions.
– Do not combine with another aminoglycoside.
– Monitor combination with: neuromuscular blockers, general anaesthetics (potentialization of their effects); amphotericin B, vancomycin, capreomycin, furosemide (enhanced renal and/or auditory toxicity).
– *Pregnancy: avoid*
– *Breast-feeding: no contra-indication*

Remarks
– Do not mix with other drugs in the same syringe or infusion.
– *Storage: below 30°C* –

GLUCOSE 50% = DEXTROSE 50%

Prescription under medical supervision

Indications

– Emergency treatment of severe hypoglycaemia

Presentation and route of administration

– Vial containing 50% hypertonic glucose solution (500 mg/ml, 50 ml), for very slow IV injection. NEVER BY IM OR SC INJECTION.

Dosage

– Child and adult: 1 ml/kg by very slow IV injection (over 5 minutes)

Contra-indications, adverse effects, precautions

– May cause:
  • vein irritation,
  • tissue necrosis in the event of extravasation.
– Check blood glucose level (reagent strip test) after 30 minutes. If blood glucose level is < 3 mmol/l or < 54 mg/dl, administer another dose or give glucose by oral route, according to the patient clinical condition. Determine and treat the underlying cause and monitor the patient as long as required.
– The solution is viscous: use a large vein and a large calibre needle.

Remarks

– 10% glucose solution (100 mg of glucose/ml) may be used to treat severe hypoglycaemia: 5 ml/kg by slow IV injection. 10% glucose solution is preferred in children as it is less viscous and irritant than 50% solution.
– In neonatal hypoglycaemia, use 10% glucose only, at a rate of 5 ml/kg/hour. Administer a loading of 2.5 ml/kg over 5 minutes in severe neonatal hypoglycaemia with loss of consciousness or seizures.
– *Storage: below 30°C*

HEPARIN

Prescription under medical supervision

Therapeutic action

– Anticoagulant

By IV injection: acts immediately for about 2 to 4 hours

By SC injection: acts within 1 hour for about 8 to 12 hours

Indications

– Venous and arterial thrombosis: pulmonary embolism, myocardial infarction, thrombophlebitis
– Prevention of venous and arterial thrombosis, especially in pre-operative and postoperative period and in patients on bedrest

Prescription of heparin requires systematic monitoring of coagulation parameters.

Presentation and route of administration

– 1000 IU in 1 ml ampoule (1000 IU/ml) and 5000 IU in 1 ml ampoule (5000 IU/ml) for IV injection or infusion, diluted in an isotonic solution of glucose or sodium chloride
– 25 000 IU in 1 ml ampoule (25 000 IU/ml) for SC injection

Also comes in various concentrations (500 IU, 12 500 IU, 20 000 IU/ml) and volumes (0.5 ml, 2 ml, 5 ml). Check label before use.

Dosage

– *Curative treatment*
  • By IV route
    Child and adult: initial dose of 50 to 100 IU/kg followed by 400 to 600 IU/kg/day, by continuous infusion over 24 hours or by IV injection every 2 to 4 hours. Adjust dosage according to coagulation tests.
  • By SC route
    Child and adult: 1 SC injection every 12 hours. Start with an initial dose of 250 IU/kg and adjust dosage according to coagulation tests.
– *Preventive treatment*
  Usually: 5000 IU by SC injection 2 hours before surgery, repeated every 8 to 12 hours.
  Dosage depends on patient's weight and risk of thrombo-embolic complications: 150 IU/kg/day in 2 to 3 divided doses.

Duration

– About 7 to 10 days or more according to clinical response.
– In postoperative period, administer until fully ambulatory.
– For long-term therapy, administer heparin simultaneously with oral anticoagulants for 2 to 3 days before stopping heparin.

Contra-indications, adverse effects, precautions

- Do not administer if:
  - haemorrhage or risk of haemorrhage: haemophilia, active peptic ulcer, acute bacterial endocarditis, severe hypertension; in postoperative period after neurosurgery or ophtalmic surgery;
  - thrombocytopenia or history of heparin-induced thrombocytopenia.
- Do not administer by IM route. SC injections must be made deep into abdominal fat, between umbilicus and iliac crest.
- Intramuscular or intra-arterial injections and infiltrations are contra-indicated during heparin therapy.
- May cause:
  - severe thrombocytopenia, usually after 5 days of heparin, with thrombo-embolic complications requiring discontinuation of treatment;
  - localised reactions at the injection site, rarely, necrosis;
  - allergic reactions, osteoporosis after prolonged use, alopecia;
  - haemorrhage in case of overdosage, pre-existing lesions, trauma.
- Use with caution and reduce dosage in elderly patients and in hepatic or renal failure.
- Overdosage: neutralise heparin by slow IV injection of protamine. 1 mg protamine neutralises 100 IU of heparin.
  Reduce doses of protamine if more than 15 minutes has elapsed since heparin administration.
- Laboratory tests: monitor coagulation parameters in order to adjust dose. Partial thromboplastin time should be maintained at 1.5 to 2 times the control value (Howell's test at 2 to 3 times the control value).
- Monitor platelet count prior to initiation of treatment and then 2 times per week.
- Avoid combination with aspirin, non-steroidal anti-inflammatory drugs: increased risk of haemorrhage.
- Closely monitor clinical and biological parameters in case of combination with corticosteroids, dextran, and transition to an oral anticoagulant.
- *Pregnancy: CONTRA-INDICATED at the end of pregnancy (risk of haemorrhage during delivery)*
- *Breast-feeding: no contra-indication*

Remarks

- Preparations containing calcium salt of heparin are available. Heparin sodium is usually used by IV route. Both sodium and calcium heparin are used by SC route. There is a little difference in the action of these 2 medications.
- Do not mix with other drugs in the same syringe.
- *Storage: keep in a cool place (8°C to 15°C)* – 

HALOPERIDOL
(Haldol®, Serenace®…)

Prescription under medical supervision

Therapeutic action
– Neuroleptic

Indications
– Acute psychoses: psychomotor agitation, acute mania, delirium tremens
– Severe vomiting induced by antineoplastic drugs

Presentation and route of administration
– 5 mg in 1 ml ampoule (5 mg/ml) for IM injection or IV infusion

Dosage
– Adult: 2 to 10 mg/day by IM injection, repeated at intervals of 4 to 8 hours if necessary
– In patients receiving chemotherapy: 5 mg by IV infusion or 1 to 5 mg by IM injection, repeated after 12 hours if necessary.

Duration: according to clinical response

Contra-indications, adverse effects, precautions
– Do not administer to children and to patients suffering from Parkinson's disease.
– In case of hyperthermia following an injection, stop treatment: possible neuroleptic malignant syndrome.
– May cause: extrapyramidal syndrome, dyskinesia, orthostatic hypotension.
– Do not combine with levodopa.
– Do not drink alcohol during treatment.
– Risk of increased sedation when combined with depressants of the central nervous system (morphine and derivatives, anxiolytics, antihistamines…).
– *Pregnancy: avoid*
– *Breast-feeding: avoid*

Remarks
– Haloperidol decanoate is a long-acting form acting as a pro-drug, releasing slowly haloperidol, used in the long-term treatment of psychotic disorders in patients stabilised on oral treatment (one IM injection every 3 to 4 weeks).
– Haloperidol may induce more extrapyramidal reactions than chlorpromazine, but less often provoke sedation and orthostatic hypotension.
– If administered by infusion, protect the bottle from light.
– *Storage: below 30°C* – 

HYDRALAZINE
(Apresoline®…)

Prescription under medical supervision

Therapeutic action
– Antihypertensive vasodilatator

Indications
– Severe hypertension in pregnancy, when oral treatment is not possible

Presentation and route of administration
– Powder for injection, 20 mg vial, to be dissolved in 2 ml of water for injection, for slow IV injection or IV infusion

Dosage
Dosage must be adapted according to BP: treatment is administered if the diastolic BP is ≥ 110 mmHg. Hypertension is controlled when diastolic BP remains between 90 and 100 mmHg. During administration diastolic BP must never fall below 90 mmHg. Monitor maternal BP and pulse, as well as fœtal heart rate.

– *By IV infusion*
  - Dilute 100 mg (5 ampoules) in 500 ml of sodium chloride 0.9% or Ringer lactate to obtain a solution containing 200 micrograms/ml.
  - Initial dose: 200 to 300 micrograms/minute; maintenance dose: 50 to 150 micrograms/minute.
  - Administer by increasing the rate up to 20 drops/minute (maximum 30 drops/minute), check BP every 5 minutes.
  - As soon as hypertension is controlled, decrease progressively the rate (15 drops/minute, then 10, then 5) until stopping infusion. An abrupt discontinuation may provoke a hypertensive crisis.

– *By slow IV injection*
  Administer 5 mg by slow IV injection (over 2 minutes) and check BP for 20 minutes. If diastolic BP remains ≥ 110 mmHg, repeat injection. Continue repeating if necessary, waiting 20 minutes between each injection, without exceeding a total dose of 20 mg.

Duration
– Change over to an oral antihypertensive as soon possible.

Contra-indications, adverse effects, precautions
– Administer with caution to patients with heart failure, coronary insufficiency, recent myocardial infarction, severe tachycardia, history of stroke.
– Reduce doses in patients with renal or hepatic impairment.
– May cause: tachycardia, headache, nausea, hypotension.
– Respect dosage and administration rate. An overdose or too rapid administration may provoke an abrupt and excessive fall in maternal blood pressure with placental hypoperfusion and fœtal death.
– In the event of hypotension, administer Ringer lactate to maintain diastolic BP ≥ 90 mmHg.
– *Pregnancy: avoid during the 1st trimester*
– *Breast-feeding: no contra-indication*

Remarks
– For administration, only use sodium chloride 0.9 % or Ringer lactate (incompatibility with glucose and other solutions).
– Do not mix with other drugs in the same syringe or infusion bottle.
– *Storage: below 30°C* –

HYDROCORTISONE
(Efcortesol®, Solu-cortef®…)

Prescription under medical supervision

Therapeutic action

– Steroidal anti-inflammatory drug (corticosteroid)

Indications

– Symptomatic treatment of severe allergic and inflammatory reactions, e.g.: severe acute asthma (in addition to inhaled salbutamol), allergic angioedema, anaphylactic shock (as an adjunct to epinephrine)

Presentation and route of administration

– Powder for injection, 100 mg hydrocortisone (hemisuccinate, succinate or phosphate) in vial, to be dissolved in 2 ml water for injection, for IM or slow IV injection or infusion

Dosage and duration

– Child under 1 year: 25 mg/injection
– Child from 1 to 5 years: 50 mg/injection
– Child from 6 to 12 years: 100 mg/injection
– Adult: 100 to 500 mg/injection

Doses may be repeated 3 or 4 times daily according to the severity of the symptoms and the patient's response.

Contra-indications, adverse effects, precautions

– Avoid prolonged administration in patients with peptic ulcer, diabetes mellitus or cirrhosis.
– Administer with caution to patients receiving digitalis glycosides: increases digitalis toxicity associated with hypokalaemia.
– *Pregnancy: use only if clearly needed, for a short period*
– *Breast-feeding: no contra-indication*

Remarks

– Hydrocortisone acetate is a suspension insoluble in water, used as a local treatment only: intra- or peri-articular injection, epidural (sciatic neuralgia).
– *Storage: below 30°C* – 

HYOSCINE BUTYLBROMIDE = BUTYLSCOPOLAMINE (Buscopan®…)

Prescription under medical supervision

Therapeutic action
– Antispasmodic

Indications
– Spasms of the gastrointestinal tract and genitourinary tract

Presentation and route of administration
– 20 mg in 1 ml ampoule (20 mg/ml) for IM, SC or slow IV injection

Dosage
– Child under 6 years: 5 mg/injection, to be repeated up to 3 times per day if necessary
– Child from 6 years to 12 years: 0.5 mg/kg/injection to be repeated up to 3 to 4 times per day if necessary
– Adult: 20 to 40 mg/injection, to be repeated if necessary; do not exceed 100 mg/day

Duration: according to clinical response; no prolonged treatment.

Contra-indications, adverse effects, precautions
– Do not administer to patients with urethro-prostatic disorders, cardiac disorders, glaucoma.
– Do not administer to children with high fever.
– May cause: urinary retention, dryness of the mouth, constipation, blurred vision, tachycardia.
– Administer with caution to children under 6 years.
– Administer with caution and under close supervision to patients taking other anti-cholinergic drugs (antidepressants, neuroleptics, H-1 antihistamines, antiparkinsonians, etc.).
– *Pregnancy: no contra-indication;* NO PROLONGED TREATMENT
– *Breast-feeding: no contra-indication;* NO PROLONGED TREATMENT

Remarks
– Antispasmodic drugs are not included in the WHO list of essential medicines.
– *Storage: below 30°C* –

INSULIN

Prescription under medical supervision

General information

Therapeutic action

– Pancreatic hormone, antidiabetic

Classification

– There are 3 main types of insulin preparations, differing in onset and duration of action:

Administration by SC route	Short-acting insulin	Intermediate-acting insulin	Long-acting insulin
Onset	30 minutes to 1 hour	1 to 2 hours	2 to 4 hours
Time to peak	2 to 5 hours	4 to 12 hours	8 to 20 hours
Duration	6 to 8 hours	10 to 24 hours	24 to 36 hours
Description	solution	suspension	suspension
Appearance	clear	opalescent	opalescent

– Duration of action is indicated for each preparation by the manufacturer. For each preparation, onset and duration vary greatly according to the patient and route of administration.
– The type of insulin used depends on the type of diabetes, patient's age and blood glucose levels.

Indications

– Insulin-dependent diabetes
– Diabetes during pregnancy
– Degenerative complications of diabetes : retinopathy, neuropathy...
– Non-insulin-dependent diabetics during periods of severe infection, trauma, surgery.

Dosage

– Dosage must be individualised. Frequency of administration depends on the type of insulin and the patient's response. There is no standardized protocol.
Never exceed 200 IU/day, whatever the type of insulin.

Duration

– *Insulin-dependent diabetics:* life-time treatment
– *Other cases:* according to clinical response and laboratory tests

Contra-indications, adverse effects, precautions

- Do not administer in patients with allergy to insulin (rare).
- May cause :
  - hypoglycaemia due to overdosage or inadequate diet. Treat mild hypoglycaemia with intake of oral sugar and IV injection of hypertonic glucose solution if severe;
  - local reactions: pain, erythema at the injection site, lipodystrophy. Rotate injection sites systematically and use all available sites (upper arm, thighs, abdomen, upper back).
- Patient monitoring: blood and urine glucose concentrations, urine ketone tests.
  Blood glucose concentrations should be maintained within the range of 4.4 to 8 mmol/litre under fasting (8 mmol = 1.4 g).
  Diabetes is controlled when:
  - there are no glucose and ketones in urine;
  - before-meal blood glucose levels are < 1.2 g/litre (< 6.67 mmol/litre);
  - postprandial blood glucose levels are ≤ 1.4 g/litre (< 7.78 mmol/litre).
- Treatment of diabetes must be initiated in hospital under close supervision.
  Treatment includes: insulin administration, specific diet, education and counselling under medical supervision (self-monitoring of blood glucose, self-administration of insulin, knowledge about signs of hypoglycaemia and hyperglycaemia).
- Closely monitor combination with:
  - drugs enhancing hypoglycaemic effect: acetylsalicylic acid, angiotensin-converting enzyme inhibitors, beta-blockers (which in addition, may mask symptoms of hypoglycaemia);
  - drugs increasing blood glucose levels: glucocorticoids, salbutamol, chlorpromazine, oral contraceptives.
- Avoid alcohol: enhances and prolongs hypoglycaemic effect of insulin.
- Use sterile technique.
- *Pregnancy: no contra-indication*
- *Breast-feeding: no contra-indication*

Remarks

- Insulin is obtained by extraction from bovine or porcine pancreases. The term mono-component insulin is used for highly purified insulin.
- Insulin of human sequence is prepared either semisynthetically by modification of porcine material or biosynthetically.
- Preparations of human or animal origin have the same hypoglycemic effect. There is generally no significant difference.
- Insulin cannot be administered by mouth since it is inactivated in the gastro-intestinal tract.

INTERMEDIATE-ACTING INSULIN (Insulatard®, Semitard®…)

LONG-ACTING INSULIN (Ultralente®, Ultratard®…)

Prescription under medical supervision

Therapeutic action

– Insulin suspension modified by addition of protamine and/or zinc, in order to prolong the duration of action

Indications

– As for insulin in general, except in the emergency treatment of diabetic ketoacidosis and coma

Presentation and route of administration

– 400 IU of insulin suspension in 10 ml vial (40 IU/ml) for deep SC injection, administered with a calibrated syringe for IU-40 insulin.
Also comes in solution containing 100 IU/ml, administered only with calibrated syringe for IU-100 insulin.
IM route may be used but SC route is less painfull and drug action is longer and more regular.

Dosage

– 20 to 40 IU/day divided in 2 injections for intermediate-acting insulin, in 1 or 2 injections for long-acting insulin.
Administer 15 to 30 minutes before meals. Increase by 2 IU/day until reaching the blood glucose level required. Adjust dosage and frequency of injections according to patient's needs.
Short-acting insulin is often administered in combination with an intermediate-acting or long-acting insulin.
Examples of regimens:

Insulin	Administration
– Short-acting insulin – Intermediate-acting insulin	– 2 times/day before breakfast and lunch – at bedtime
– Short-acting insulin – Long-acting insulin	– 3 times/day before breakfast, lunch and dinner – at bedtime or before breakfast
– Intermediate-acting with or without short-acting insulin	– 2 times/day before breakfast and dinner

Contra-indications, adverse effects, precautions

– See "insulin: general information".
– **Never administer by IV injection.**
– Do not administer if known allergy to protamine.
– Shake suspension gently before use. Remove from the refrigerator 1 hour before administration or roll the vial between hands.

Remarks

– *Storage: to be kept refrigerated (2°C to 8°C) –*
  • *Do not freeze; discard if freezing occurs.*
  • *Most manufacturers consider that a solution stored by the patient at a temperature up to 25°C and protected from light is stable for 1 month.*

SHORT-ACTING INSULIN (Actrapid®, Velosulin®…)

Prescription under medical supervision

Therapeutic action

– Soluble insulin, sometimes called neutral insulin, regular insulin or unmodified insulin.

Indications

– As for insulin in general, particularly in cases of diabetic ketoacidosis and diabetic coma.

Presentation and route of administration

– 400 IU of insulin in 10 ml vial (40 IU/ml) for deep SC injection, IM or IV injection, administered with a calibrated syringe for IU-40 insulin.
Also comes in solution containing 100 IU/ml, administered only with calibrated syringe for IU-100 insulin.

Dosage

– *Emergency treatment of ketoacidosis and diabetic coma*
  • Child: initial dose 0.1 IU/kg by direct IV injection followed by 0.3 IU/kg every 4 hours.
  • Adult: initial dose of 5 to 20 IU by direct IV injection followed by 10 to 20 IU every hour *via* the drip tubing. When ketone bodies are cleared and blood glucose level has fallen to less than 20 mmol/litre, give 20 IU by SC injection every 4 to 6 hours according to blood glucose level.

  Treat dehydration with a sodium chloride solution, then glucose-saline solution.
  Correct cautiously acidosis with isotonic solution of bicarbonate and, if necessary, post-insulinic hypokalaemia.

– *Treatment of diabetes mellitus*
  Start with 5 IU, 15 minutes before meals, 3 to 4 times/day by SC injection. Adjust dosage according to blood glucose levels before and after meal. Adjustments should not exceed 10 IU/day.
  When hyperglycemia is controlled, an intermediate-acting insulin may be substituted in order to limit injections.
  Short-acting insulin may be mixed with intermediate-acting insulin in the proportion of 10 to 50%.

Contra-indications, adverse effects, precautions

– See "Insulin: general information".

Remarks

– The terms "cristalline insulin" and "neutral insulin" are used either for soluble insulin or intermediate and long-acting insulin.
– *Storage: to be kept refrigerated (2°C to 8°C) –*
  • *Do not freeze.*
  • *Most manufacturers consider that a solution stored by the patient at a temperature up to 25°C and protected from light, is stable for 1 month.*

KETAMINE
(Calypsol®, Ketalar®, Ketanest®…)

Prescription under medical supervision

Therapeutic action
– General anaesthetic

Indications
– Induction and maintenance of general anaesthesia

Presentation and route of administration
– 500 mg in 10 ml vial (50 mg/ml) for IM, IV injection or infusion

Also comes in 5 ml and 20 ml ampoules containing 10 mg/ml and 5 ml ampoule containing 100 mg/ml for IM, IV injection or infusion.

Dosage
Child and adult:
– *Induction*
  • IV: 2 mg/kg to be injected slowly. Anaesthesia is produced within one minute and lasts for 10 to 15 minutes.
  • IM: 10 mg/kg. Anaesthesia is produced within 5 minutes and lasts for 15 to 30 minutes.
– *Maintenance*
  • IV: 0.5 to 1 mg/kg depending on recovery signs (approximately every 15 minutes)
  • IM: 5 mg/kg approximately every 20 to 30 minutes

Duration: depending on duration of the operation

Contra-indications, adverse effects, precautions
– Do not administer to patients with intraocular hypertension, pre-eclampsia.
– Administer with caution to patients with arterial or intracranial hypertension, coronary insufficiency, psychiatric disorders.
– May cause: hypertension, hypersalivation, hallucinations during recovery (less frequent in children or when injected IM), apnoea following rapid IV injection.
– Premedication to prevent hypersalivation and hallucinations:
  • atropine IV: 0.01 to 0.015 mg/kg + diazepam slow IV: 0.1 mg/kg, during induction
  or
  • atropine IM : 0.01 to 0.015 mg/kg + diazepam IM : 0.1 mg/kg, 30 minutes before induction
– Technical equipment for intubation and ventilation must be available and ready for use.
– *Pregnancy: no contra-indication, except in pre-eclampsia. For ceaserean sections, do not exceed 1 mg/kg by IV injection (risk of neonatal respiratory depression at higher doses).*
– *Breast-feeding: no contra-indication*

Remarks
– Ketamine has no muscle relaxant properties.
– In some countries, ketamine is on the list of narcotics: follow national regulations.
– *Storage:*

LEVONORGESTREL subdermal implant (Jadelle®…)

Prescription under medical supervision

Therapeutic action

– Hormonal contraceptive, progestogen

Presentation and route of administration

– Set of two flexible rods containing 75 mg of levonorgestrel, with a sterile applicator (reusable after sterilisation or for single use only, depending on the presentation), to be inserted subdermally into the inner side of the non-dominant arm, 6 to 8 cm above the elbow crease, under local anaesthesia and aseptic conditions

Indications

Long-term contraception:

– *If no current contraception, the implant is inserted:*
during the first 7 days of menstruation
or immediately after abortion
or after childbirth:
  • if the woman breastfeeds: as of the sixth week postpartum
  • if the woman does not breastfeed: as of the 21st day postpartum

However, if there is a risk that the woman may be lost to follow-up, the implant may be inserted whenever, even after childbirth, whether she breastfeeds or not.

– *When switching from another contraceptive method, the implant is inserted:*
for an oral estroprogestogen: the day after taking the last active tablet in the pack
for an oral progestogen: at any stage of the cycle
for an injectable progestogen: the day the next injection is due
for an intrauterine device: the day of its removal

Duration

– The implant slowly releases a low dose of levonorgestrel. It is left inserted, as long as contraception is desired and it is well tolerated, for a maximum of 5 years (4 years in women over 60 kg) after which it no longer provides contraception and must be changed.

Contra-indications, adverse effects, precautions

– Do not use in patients with breast cancer, severe or recent liver disease, unexplained vaginal bleeding or current thromboembolic disorders.
– May cause: headache, acne, menstrual irregularities, amenorrhoea, menometrorrhagia, breast tenderness, weight gain, mood changes, abdominal pain, gastrointestinal disturbances, itching, allergic reaction.
– Hepatic enzyme inducers (rifampicin, rifabutin, nevirapine, nelfinavir, ritonavir, phenobarbital, phenytoin, carbamazepine, griseofulvin, etc.) may reduce the contraceptive efficacy. Use a non-hormonal contraceptive method (copper intrauterine device, condoms) or an oral contraceptive containing 50 µg ethinylestradiol (however there is still a risk of contraceptive failure and the risk of adverse effects is increased) or injectable medroxyprogesterone.
– Do not insert the rods deeply as the removal can be difficult later on. They should be palpable under the skin. Read carefully manufacturer's instructions.
– Remove them under local anaesthesia and aseptic conditions, using a forceps, after incision with scalpel.
– *Pregnancy*: **CONTRA-INDICATED**

Remarks

– Implants provide long term contraception, their efficacy is not conditioned by observance. Fertility returns rapidly after removal of the implant.
– The duration of action of the levonorgestrel implant (5 years) is longer than that of the etonogestrel implant (3 years). However, the etonogestrel implant (one rod) is easier to insert/remove than the levonorgestrel implant (2 rods).
– *Storage: below 30°C* –

LIDOCAINE = LIGNOCAINE
(Xylocaine®…)

Prescription under medical supervision

Therapeutic action
– Local anaesthetic

Indications
– Local anaesthesia: • minor operations : 1% lidocaine plain
• dental surgery : 2% lidocaine (plain or with epinephrine)

Presentation and route of administration
– 1% solution in 20 and 50 ml vials (10 mg/ml), for SC infiltration
– 2% solution in 20 and 50 ml vials (20 mg/ml), for SC infiltration

Dosage
– The volume to be injected depends on the surface area to be anesthetised.
– Do not exceed: Child: 5 mg/kg/injection
Adult: 200 mg = 20 ml of lidocaine 1% or 10 ml of lidocaine 2%

AGE	**0**	**2 months**	**1 year**	**5 years**	**15 years**	**ADULT**
WEIGHT		**4 kg**	**8 kg**	**15 kg**	**35 kg**	
1 % solution, 10 mg/ml		2 to 3 ml	4 to 8 ml	9 to 15 ml	15 to 20 ml	
2 % solution, 20 mg/ml		1 to 1 1/2 ml	2 to 4 ml	4 to 7 ml	7 to 10 ml	

Duration: one injection, repeated if necessary

Contra-indications, adverse effects, precautions
– Do not administer if known allergy to lidocaine, impaired cardiac conduction.
– When anaesthetising the extremities, inject distally (at the base), in circle, without tourniquet and without epinephrine (adrenaline).
– Do not use lidocaine for the incision of abscesses: risk of spreading the infection.
– **Lidocaine with epinephrine (adrenaline):**
• in dental surgery, epinephrine added to lidocaine prolongs anaesthesia;
• never use solutions with epinephrine for the anaesthesia of extremities (fingers, penile nerve block): risk of ischemia and necrosis.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Anaesthesia is produced within 2 to 5 minutes and lasts 1 to 1.5 hours.
– Do not confuse with lidocaine 5% hyperbaric which is reserved for spinal anaesthesia.
– The more concentrated the lidocaine, the more localised the anaesthetic effect.
– To simplify protocols, use lidocaine 2% with epinephrine for dental anaesthesia and lidocaine 1% without epinephrine for cutaneous anaesthesia.
– *Storage: below 30°C –*

MAGNESIUM SULFATE

Prescription under medical supervision

Therapeutic action

– Anticonvulsant

Indications

– Eclampsia: treatment of eclamptic seizures and prevention of recurrence
– Severe pre-eclampsia: prevention of eclamptic seizures

Presentation and route of administration

– 1 g ampoule (500 mg/ml, 2 ml) and 5 g ampoule (500 mg/ml, 10 ml) for IM injection or IV infusion

Warning, also comes in different concentrations: ampoule containing 1.5 g (150 mg/ml, 10 ml), 2 g (100 mg/ml, 20 ml), 3 g (150 mg/ml, 20 ml) and 4 g (200 mg/ml, 20 ml). Check concentration before use, there is a risk of potentially fatal overdosage.

Dosage and duration

– *IV protocol:*
  Start with a loading dose of 4 g, to be administered by IV infusion in 0.9% sodium chloride over 15 to 20 minutes.
  Then administer a maintenance dose of 1 g per hour by continuous IV infusion. Continue this treatment for 24 hours after the delivery or the last seizure.
– *IV/IM protocol:*
  Start with a loading dose of 4 g, to be administered by IV infusion in 0.9% sodium chloride over 15 to 20 minutes.
  Then administer by IM route: 10 g (5 g in each buttock) followed by 5 g every 4 hours (changing buttock for each injection). Continue this treatment for 24 hours after the delivery or the last seizure.

Regardless of the protocol chosen, in the event that seizures persist or recur: administer a further 2 g (patients < 70 kg) to 4 g by IV infusion, without exceeding 8 g total dose during the first hour.

Contra-indications, adverse effects, precautions

– Do not administer to patients with severe renal failure.
– Check:
  • urine output every hour,
  • patellar reflex, blood pressure, pulse and respiratory rate every 15 minutes during the first hour of treatment. If no signs of overdosage are observed, continue this surveillance every hour.
– May cause:
  • pain at the injection site, warm flushes,
  • in the event of overdosage: diminished then absent patellar reflex (early sign of hypermagnesaemia), hypotension, drowsiness, difficulty in speaking, confusion, arrhythmias, respiratory depression (respiratory rate < 12/minute).

– In the event of decreased urine output (< 30 ml/hour or 100 ml/4 hour):
  • pre-eclampsia: stop magnesium sulfate and perform delivery as soon as possible,
  • eclampsia: stop magnesium sulfate and perform delivery immediately. If delivery cannot be performed *immediately*, stop magnesium sulfate for one hour then resume magnesium sulfate perfusion until delivery.
– In the event of overdosage: stop magnesium sulfate and give 1 g calcium gluconate by IV route as an antidote (in this event, the anticonvulsant effect is reversed and seizures may recur).
– Reduce dose in patients with renal impairment.
– Do not combine with nifedipine and quinidine.
– *Pregnancy: no contra-indication*

Remarks

– Regardless of the protocol chosen, delivery must be performed:
  • within 12 hours after the first seizure in the event of eclampsia,
  • within 24 hours after the appearance of symptoms in the event of severe pre-eclampsia.
– 1 g magnesium sulfate contains approximately 4 mmol (or 8 mEq) of magnesium.
– Do not mix with other drugs in the same syringe or infusion fluid.
– *Storage: below 30°C* –

MEDROXYPROGESTERONE
(Depo-Provera®…)

Prescription under medical supervision

Therapeutic action
– Hormonal contraceptive, long-acting progestogen (3 months)

Indications
– Contraception

Presentation and route of administration
– 150 mg in 1 ml vial (150 mg/ml) for IM injection

Dosage
– 150 mg per injection, one injection every 12 weeks
– The first injection is given:
  during the first 5 days of menstruation
  or immediately after abortion
  or after childbirth:
  - if the woman breastfeeds: as of the sixth week. However, if there is a risk that the woman may be lost to follow-up or if this is the only available or acceptable contraceptive, the injection may be given before 6 weeks, even after childbirth.
  - if the woman does not breastfeed: between the 1st and the 21st day postpartum

Duration: if there are no adverse effects, as long as contraception is desired.

Contra-indications, adverse effects, precautions
– Do not administer to patients with breast cancer, uncontrolled hypertension, history of thromboembolic disorders, coronary insufficiency, stroke, non equilibrated or complicated diabetes, severe or recent liver disease, unexplained vaginal bleeding.
– May cause: menstrual irregularities, amenorrhoea, menometrorrhagia, nausea, vomiting, allergic reactions, weight gain.
– In post-partum period, it is better to wait until the fifth day if possible, as the risk of bleeding is increased if the injection is administered between D0 and D4.
– Clinical examinations must be carried out before (blood pressure, breasts) and, if needed, during treatment.
– Medroxyprogesterone acetate is a suspension: shake vial before use.
– *Pregnancy*: **CONTRA-INDICATED**

Remarks
– The contraceptive efficacy of medroxyprogesterone does not seem to be reduced in women taking hepatic enzyme inducers. For these women, medroxyprogesterone is therefore an alternative to subdermal implants and oral contraceptives.
– The following injections may be administered within the 2 weeks before the scheduled date and up to 2 weeks after, without the need for additional contraception.
– Return of fertility may be delayed long after the discontinuation of treatment (3 to 12 months).
– There is a combined contraceptive injection containing medroxyprogesterone acetate 25 mg + estradiol cipionate 5 mg (Cyclofem®, Lunelle®) administered once monthly.
– *Storage: below 30°C*

MEDROXYPROGESTERONE + ESTRADIOL (Cyclofem®, Lunelle®…)

Prescription under medical supervision

Therapeutic action

– Combined hormonal contraceptive, long-acting estrogen-progestogen (1 month)

Indications

– Contraception

Presentation

– 25 mg medroxyprogesterone acetate + 5 mg estradiol cipionate in 0.25 ml vial, for IM injection

Dosage

– 25 mg + 5 mg per injection, one injection every 4 weeks
– The first injection is given:
during the first 5 days of menstruation
or immediately after abortion
or as of the 21st day after childbirth, if the woman does not breastfeed

Duration: if there are no adverse effects, as long as contraception is desired.

Contra-indications, adverse effects, precautions

– Do not administer to women with breast cancer, uncontrolled hypertension, non equilibrated or complicated diabetes, history of thromboembolic disorders, coronary insufficiency, valvular disease, stroke, severe or recent liver disease, unexplained vaginal bleeding, migraine with neurological signs, renal impairment, hyperlipidaemia; to women smokers over age 35.
– May cause: oligo-amenorrhoea, vaginal candidiasis, nausea, weight gain, breast tenderness, mood changes, acne and headache. Other rare and severe adverse effects require discontinuation of treatment: hypertension, cardiovascular and thromboembolic disorders, jaundice, hepatic adenoma, migraine, visual disturbances.
– Hepatic enzyme inducers (rifampicin, rifabutin, nevirapine, nelfinavir, ritonavir, phenobarbital, phenytoin, carbamazepine, griseofulvin, etc.) reduce the contraceptive efficacy. Use a non-hormonal contraceptive method (copper intrauterine device, condoms) or an oral contraceptive containing 50 µg ethinylestradiol (however there is still a risk of contraceptive failure and the risk of adverse effects is increased) or injectable medroxyprogesterone (150 mg vial).
– Clinical examinations must be carried out before (blood pressure, breasts) and during treatment (blood pressure).
– *Pregnancy*: **CONTRA-INDICATED**
– *Breast-feeding*: **CONTRA-INDICATED** *before 6 weeks; not recommended between 6 weeks and 6 months (except if it is the only available or acceptable contraceptive method); no contra-indication after 6 months.*

Remarks

– The following injections may be administered within 7 days before the scheduled date or up to 7 days after, without the need for additional contraception.
– The combination medroxyprogesterone + estradiol is better tolerated than injectable progestogens alone (medroxyprogesterone or norethisterone). However, this combination cannot be used in women for whom estrogens are contra-indicated and the interval between each injection in only one month.
– *Storage: below 30°C*

MELARSOPROL
(Arsobal®…)

Prescription under medical supervision

Therapeutic action

– Trypanocide (arsenical derivative)

Indications

– Meningoencephalitic stage of African trypanosomiasis due to *T. b. gambiense* and *T. b. rhodesiense*

Presentation and route of administration

– 180 mg in 5 ml ampoule (36 mg/ml), 3.6 % solution in propylene glycol, for slow IV injection.
NEVER BY IM OR SC INJECTION.

Dosage and duration

Patients must be treated in hospital under close medical supervision.

– *Gambiense trypanosomiasis*
Child and adult: 2.2 mg/kg (max. 5 ml) once daily for 10 consecutive days

– *Rhodesiense trypanosomiasis*
Child and adult: 3.6 mg/kg/injection (i.e. 1 ml/10 kg, without exceeding 5 ml/injection). The treatment consists of 9 to 12 injections in total, administered as 3 to 4 courses of 3 to 4 injections (one per day), with an interval of 7 to 10 days between each course.
It is recommended to start with an initial low dose (1.2 to 1.8 mg/kg) then, to increase gradually to the maximum dose of 3.6 mg/kg.

Contra-indications, adverse effects, precautions

– May cause:
  • reactive encephalopathy (5-10 % of cases): repeated or prolonged seizures, coma, psychical disorders, usually between the 5th and the 8th day of the ten-day treatment (but sometimes later, even after the patient has been discharged) or just before/during the 2nd course of the intermittent treatment;
  • arsenical reactions: headache, fever, tachycardia, hypertension, jaw pain, neurological disorders (hyperreflexia);
  • gastrointestinal disturbances, skin reactions (exfoliative dermatitis, urticaria), peripheral neuropathy, haematological disorders (haemolytic anaemia in patients with G6PD deficiency, agranulocytosis), hepatic or renal impairment, myocardial damage;
  • swelling, pain, phlebitis, venous sclerosis, necrosis at injection site in the event of extravasation during IV administration.
– Use a completely dry syringe: the solution precipitates in presence of water. As propylene glycol can dissolve plastic, the drug should preferably be administered using a glass syringe (only if sterilisation is reliable), otherwise inject immediately (but slowly) using a plastic syringe.
– *Pregnancy*: **CONTRA-INDICATED**

Remarks

– Oral prednisolone is frequently associated during the course of treatment.
– For the treatment of meningoencephalitic stage of gambiense trypanosomiasis, the drug of choice is eflornithine.
– *Storage: below 25°C* –

METAMIZOLE = DIPYRONE = NORAMIDOPYRINE (Nolotil®, Novalgin®…)

Prescription under medical supervision

USE THIS DRUG ONLY IN SERIOUS SITUATIONS WHERE NO ALTERNATIVE IS AVAILABLE.
- **it is potentially harmful;**
- **it is forbidden to market this drug in many countries;**
- **it must never be prescribed as a first choice treatment.**

Therapeutic action
- Analgesic
- Antipyretic

Indications
- Severe pain
- High fever

Presentation and route of administration
- 1 g in 2 ml ampoule (500 mg/ml) for IM, SC or slow IV injection or infusion

Dosage
- Child: 10 mg/kg/injection
- Adult: 500 mg/injection

AGE	0	2 months	1 year	5 years	15 years	ADULT
WEIGHT		4 kg	8 kg	15 kg	35 kg	
500 mg/ml ampoule			0.2 ml	0.5 ml	1 to 2 ml	
	Repeat every 8 hours if necessary					

Duration: according to clinical response

Contra-indications, adverse effects, precautions
- Do not administer in gastric ulcer.
- May cause: severe and fatal cases of agranulocytosis. The risk is unpredictable and independent of the administered dose.
- *Pregnancy: avoid*
- *Breast-feeding: avoid*

Remarks
- Metamizole is not included in the WHO list of essential drugs.
- *Storage:* no special temperature requirements

METOCLOPRAMIDE
(Primperan®…)

Prescription under medical supervision

Therapeutic action
– Anti-emetic

Indications
– Postoperative nausea and vomiting

Presentation and route administration
– 10 mg in 2 ml ampoule (5 mg/ml) for IM or slow IV injection
Also comes in 100 mg in 5 ml ampoule (20 mg/ml).

Dosage
– Child:

Age	Weight	Daily dose	10 mg ampoule
Under 1 year	Under 10 kg	1 mg x 2	0.2 ml x 2
1 to 3 years	10 to 14 kg	1 mg x 2 to 3	0.2 ml x 2 to 3
3 to 5 years	15 to 19 kg	2 mg x 2 to 3	0.4 ml x 2 to 3
5 to 9 years	20 to 29 kg	2.5 mg x 3	0.5 ml x 3
9 to 14 years	30 kg and over	5 mg x 3	1 ml x 3

– Adult: 10 mg every 6 to 8 hours as needed

Duration: according to clinical response, as short as possible

Contra-indications, adverse effects, precautions
– Do not administer to patients with gastrointestinal haemorrhage, obstruction or perforation, seizures.
– May cause:
  • drowsiness, headache,
  • rarely, extrapyramidal disorders (dyskinesia, tremor) especially in children and young patients,
  • increased frequency of seizures in epileptics,
  • worsening of Parkinson disease,
  • hyperprolactinemia in the event of prolonged treatment.
– Do not combine with levodopa.
– Avoid combination with antispasmodics (hyoscine butylbromide, atropine propantheline) and neuroleptics.
– Avoid alcohol during treatment.
– Reduce doses if renal or hepatic impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: avoid. If clearly needed, do not exceed a treatment period of 7 days.*

Remarks
– Higher doses are used for prevention and treatment of chemotherapy-induced nausea and vomiting in adults: 2 to 10 mg/kg/day by IV injection.
– *Storage: below 30°C –* 

METRONIDAZOLE
(Flagyl®…)

Prescription under medical supervision

Therapeutic action
- Antiprotozoal, antibacterial

Indications
- Severe infections due to anaerobic bacteria (*Bacteroides* sp, *Clostridium* sp, etc.), usually in combination with other antibacterials, only when oral administration is not possible

Presentation and route of administration
- 500 mg in 100 ml vial or bag (5 mg/ml), for infusion

Dosage
- Child: 20 to 30 mg/kg/day in 2 to 3 divided doses administered over 20 to 30 minutes
- Adult: 1 to 1.5 g/day in 2 to 3 divided doses administered over 20 to 30 minutes (one 500 mg-vial 2 to 3 times per day)

Duration
- According to indication. Change to oral treatment as soon as possible.

Contra-indications, adverse effects, precautions
- Do not administer to patients with allergy to metronidazole or another nitroimidazole (tinidazole, secnidazole, etc.).
- Do not drink alcohol during treatment.
- May cause: gastrointestinal disturbances, brownish urine, allergic reactions, headache, dizziness.
- Monitor combination with anticoagulants (increased risk of haemorrhage), lithium, phenytoin and ergometrine (increased plasma concentrations of these drugs).
- Administer with caution, reduce total daily dose to 1/3 and give once daily to patients with severe hepatic impairment.
- *Pregnancy: no contra-indication, avoid prolonged use*
- *Breast-feeding: avoid (significantly excreted in milk)*

Remarks
- Metronidazole is as effective by oral route than by parenteral route.
- Do not add any drugs in the infusion vial.
- *Storage: below 30°C* – 

MORPHINE

Prescription under medical supervision

Therapeutic action

– Centrally acting opioid analgesic

Indications

– Severe pain, especially in surgery, trauma and neoplastic disease

Presentation and route of administration

– 10 mg ampoule (10 mg/ml, 1 ml) for SC, IM or IV injection

Dosage

– *SC* and *IM route*
  Child over 6 months and adult: 0.1 to 0.2 mg/kg/injection, to be repeated every 4 hours if necessary
– *IV route*
  Child over 6 months and adult: 0.1 mg/kg/injection, administered in fractionated doses (0.05 mg/kg every 10 minutes), to be repeated every 4 hours if necessary

Duration: change to oral treatment as soon as possible.

Contra-indications, adverse effects, precautions

– Do not administer to patients with severe respiratory impairment or decompensated hepatic impairment.
– May cause:
  • dose-related sedation and respiratory depression, nausea, vomiting, constipation, urinary retention, confusion, raised intracranial pressure, pruritus;
  • in the event of overdose: excessive sedation, respiratory depression, coma.
– Management of respiratory depression includes assisted ventilation and/or administration of naloxone. Monitor patient closely for several hours.
– Administer with caution to patients with respiratory impairment, head injury, raised intracranial pressure, uncontrolled epilepsy or urethroprostatic disorders.
– In elderly patients and in patients with severe renal or hepatic impairment: reduce doses by half and administer less frequently, according to clinical response (risk of accumulation)
– Do not combine with opioid analgesics with mixed agonist-antagonist activity such as buprenorphine, nalbuphine, pentazocine (competitive action).
– Increased risk of sedation and respiratory depression, when combined with alcohol and drugs acting on the central nervous system: benzodiazepines (diazepam, etc.), neuroleptics (chlorpromazine, haloperidol, etc.), antihistamines (chlorphenamine, promethazine), phenobarbital, etc.
– *Pregnancy and breast-feeding: no contra-indication. The child may develop withdrawal symptoms, respiratory depression and drowsiness when the mother receives morphine at the end of the 3rd trimester and during breast-feeding. In these situations, administer with caution, for a short period, at the lowest effective dose, and monitor the child.*

Remarks

– Administer an appropriate laxative (e.g. lactulose) if analgesic treatment continues more than 48 hours.
– Morphine is on the list of narcotics: follow national regulations.
– *Storage:*

NALOXONE
(Nalone®, Narcan®, Zynox®…)

Prescription under medical supervision

Therapeutic action
– Specific opioid antagonist

Indications
– Respiratory depression induced by opioids (analgesia, anaesthesia, intoxication)
– Respiratory depression in newborns resulting from the administration of opioids to the mother

Presentation and route of administration
– 0.4 mg in 1 ml ampoule (0.4 mg/ml) for IV, IM injection or infusion in sodium chloride 0.9% or glucose 5%

Also comes in 10 ml ampoule containing 4 mg (0.4 mg/ml) and 2 ml ampoule containing 40 µg (20 µg/ml) for paediatric use.

Dosage
– Newborn: initial dose of 10 µg/kg by IV injection, followed by 10 µg/kg by IM injection every 90 minutes
– Child: 5 to 10 µg/kg by IV injection, repeated if necessary after 2 to 3 minutes, until adequate spontaneous ventilation is restored, followed by a continuous infusion of 1 to 5 µg/kg/hour, or by 5 to 10 µg/kg by IM injection every 90 minutes
– Adult: 1 to 3 µg/kg by IV injection, repeated if necessary after 2 to 3 minutes, until adequate spontaneous ventilation is restored, followed by a continuous infusion of 1 to 5 µg/kg/hour, or by 5 to 10 µg/kg by IM injection every 90 minutes.

Duration
– The duration of action of naloxone (20 to 30 minutes by IV route) is shorter than that of opioids: administration must be maintained several hours even if breathing improves.

Contra-indications, adverse effects, precautions
– May cause:
  • tachycardia, fibrillation, hypertension, pulmonary oedema when given postoperatively, due to a sudden reversal of analgesia;
  • nausea, vomiting;
  • acute withdrawal syndrome in opioid-dependent patients.
– Administer with caution and reduce dosage in case of heart failure or coronary artery disease.
– Naloxone is used in addition to assisted ventilation and must be administered under close medical supervision.
– *Pregnancy: risks linked to respiratory depression appear greater than risks linked to naloxone*
– *Breast-feeding: no contra-indication*

Remarks
– Naloxone is a specific opioid antidote. It cannot be used to antagonise the effects of other drugs producing CNS or respiratory depression.
– Efficacy in antagonising opioid effects depends not only on the dose of naloxone but also on the dose and potency of the specific opioid involved.
– IV route is preferred, use IM route if IV route is not feasible.
– *Storage:*

NORETHISTERONE
(Noristerat®…)

Prescription under medical supervision

Therapeutic action
– Hormonal contraceptive, long-acting progestogen (2 months)

Indications
– Contraception

Presentation and route of administration
– 200 mg in 1 ml ampoule (200 mg/ml), oily solution for IM injection

Dosage
– 200 mg per injection, one injection every 8 weeks
– The first injection is given:
  during the first 5 days of menstruation
  or immediately after abortion
  or after childbirth:
  • if the woman breastfeeds: as of the sixth week. However, if there is a risk that the woman may be lost to follow-up or if this is the only available or acceptable contraceptive, the injection may be given before 6 weeks, even after childbirth.
  • if the woman does not breastfeed: between the 1st and the 21st day postpartum

Duration: if there are no adverse effects, as long as contraception is desired.

Contra-indications, adverse effects, precautions
– Do not administer to patients with breast cancer, uncontrolled hypertension, history of thromboembolic disorders, coronary insufficiency, stroke, non equilibrated or complicated diabetes, severe or recent liver disease, unexplained vaginal bleeding, hyperlipidaemia.
– May cause: menstrual irregularities, amenorrhoea, menometrorrhagia, nausea, vomiting, breast tenderness, weight gain.
– Clinical examinations must be carried out before (blood pressure, breasts) and if needed, during treatment.
– *Pregnancy: CONTRA-INDICATED*

Remarks
– The following injections may be administered within the 2 weeks before the scheduled date and up to 2 weeks after, without the need for additional contraception.
– Return of fertility may be delayed long after the discontinuation of treatment.
– There is also a combined contraceptive injection containing norethisterone enantate 50 mg + estradiol valerate 5 mg (Mesigyna®) administered once monthly.
– *Storage: below 30°C*

NORETHISTERONE + ESTRADIOL
(Mesygina®…)

Prescription under medical supervision

Therapeutic action
– Combined hormonal contraceptive, long-acting estrogen-progestogen (1 month)

Indications
– Contraception

Presentation
– 50 mg norethisterone enantate + 5 mg estradiol valerate in 1 ml ampoule, for IM injection

Dosage
– 50 mg + 5 mg per injection, one injection every 4 weeks
– The first injection is given:
during the first 5 days of menstruation
or immediately after abortion
or as of the 21st day after childbirth, if the woman does not breastfeed

Duration: if there are no adverse effects, as long as contraception is desired.

Contra-indications, adverse effects, precautions
– Do not administer to women with breast cancer, uncontrolled hypertension, non equilibrated or complicated diabetes, history of thromboembolic disorders, coronary insufficiency, valvular disease, stroke, severe or recent liver disease, unexplained vaginal bleeding, migraine with neurological signs, renal impairment, hyperlipidaemia; to women smokers over age 35.
– May cause: oligo-amenorrhoea, vaginal candidiasis, nausea, weight gain, breast tenderness, mood changes, acne and headache. Other rare and severe adverse effects require discontinuation of treatment: hypertension, cardiovascular and thromboembolic disorders, jaundice, hepatic adenoma, migraine, visual disturbances.
– Hepatic enzyme inducers (rifampicin, rifabutin, nevirapine, nelfinavir, ritonavir, phenobarbital, phenytoin, carbamazepine, griseofulvin, etc.) reduce the contraceptive efficacy. Use a non-hormonal contraceptive method (copper intrauterine device, condoms) or an oral contraceptive containing 50 µg ethinylestradiol (however there is still a risk of contraceptive failure and the risk of adverse effects is increased) or injectable medroxyprogesterone (150 mg vial).
– Clinical examinations must be carried out before (blood pressure, breasts) and during treatment (blood pressure).
– *Pregnancy*: **CONTRA-INDICATED**
– *Breast-feeding*: **CONTRA-INDICATED** *before 6 weeks; not recommended between 6 weeks and 6 months (except if it is the only available or acceptable contraceptive method); no contra-indication after 6 months.*

Remarks
– The following injections may be administered within 7 days before the scheduled date or up to 7 days after, without the need for additional contraception.
– The combination norethisterone + estradiol is better tolerated than injectable progestogens alone (medroxyprogesterone or norethisterone). However, this combination cannot be used in women for whom estrogens are contra-indicated and the interval between each injection in only one month.
– *Storage: below 30°C*

OMEPRAZOLE
(Mopral®…)

Prescription under medical supervision

Therapeutic action
– Antiulcer drug (proton pump inhibitor)

Indications
– Peptic ulcer perforation

Presentation and route of administration
– Powder for injectable solution, 40 mg vial, to be dissolved in 100 ml of 0.9% sodium chloride or 5% glucose, for IV infusion

Dosage
– Adult: 40 mg once daily to be administered over 20 to 30 minutes

Duration: change to oral treatment as soon as the patient can eat.

Contra-indications, adverse effects, precautions
– May cause: headache, diarrhoea, skin rash, nausea, abdominal pain, dizziness.
– Avoid combination with itraconazole and ketoconazole (decreases efficacy of these drugs).
– Monitor combination with warfarin, digoxin, phenytoin.
– Do not exceed 20 mg/day in patients with severe hepatic impairment.
– *Pregnancy: no contra-indication*
– *Breast-feeding: avoid, administer only if clearly need*

Remarks
– Only use 0.9% sodium chloride or 5% glucose for dilution.
– Omeprazole is not included in the WHO list of essential medicines.
– *Storage: below 30°C* – 

OXYTOCIN
(Syntocinon®…)

Prescription under medical supervision

Therapeutic action
– Synthetic oxytocic

Indications
– Induction and augmentation of labour in the event of dynamic dystocia
– Treatment of postpartum haemorrhage due to uterine atony
– Prevention of postpartum haemorrhage, after vaginal delivery or caesarean section

Presentation and route of administration
– 10 IU/ampoule (10 IU/ml, 1 ml) for IM or slow IV injection or infusion in Ringer lactate or 0.9% sodium chloride or 5% glucose

Also comes in 5 IU/ampoule (5 IU/ml, 1 ml).

Dosage
– *Induction and augmentation of labour*
  • Dilute 5 IU in 500 ml of solution for infusion.
  • Initially 5 drops/minute, then increase by 5 drops/minute every 30 minutes until efficient contractions are obtained (i.e. over 10 minutes, 3 contractions lasting 40 seconds). Do not exceed 60 drops/minute.
– *Treatment of postpartum haemorrhage due to uterine atony*
  Immediately start an infusion of 20 IU in 1000 ml of Ringer lactate or 0.9% sodium chloride, at the rate of 80 drops/minute. Simultaneously, administer 5 to 10 IU by slow IV injection, to be repeated if necessary until retraction of the uterus. Do not exceed a total dose of 60 IU.
– *Prevention of postpartum haemorrhage (vaginal delivery)*
  5 to 10 IU by IM or IV injection *after* delivery of the placenta
  Only competent medical staff with experience in obstetrics can administer oxytocin *before* delivery of the placenta (risk of placental retention).
– *Prevention of postpartum haemorrhage (caesarean section)*
  5 to 10 IU by slow IV injection, systematically and immediately after the child is delivered and/or 20 UI in 1000 ml of Ringer lactate or 0.9% sodium chloride, administered over 2 hours

Duration: according to clinical response

Contra-indications, adverse effects, precautions (during labour)
– Before administering oxytocin, ensure that delivery can be accomplished by vaginal route. Do not administer oxytocin in the event of malpresentation, true cephalopelvic disproportion, complete placenta praevia, history of two caesarean sections or more.
– Administer with caution and do not exceed 30 drops/minute in the event of history of single caesarean section and grand multiparity (risk of uterine rupture).
– May cause, especially when administered too rapidly by IV route or when excessive doses are used: uterine hypertonia and/or uterine rupture, foetal distress.
– Respect the dosage and rate of administration, monitor uterine contractility and foetal heart rate.
– Do not administer simultaneously with prostaglandins. Only administer oxytocin 6 hours after the last administration of prostaglandins.

Remarks
– *Storage: to be kept refrigerated (2°C to 8°C). Do not freeze.*
  • *Expiry date indicated on the label is only valid if stored under refrigeration and protected from light. Exposure to light and heat causes the deterioration of the active ingredients and thus loss of efficacy.*
  • *If refrigeration is not available, vials kept below 30°C and protected from light may be stored for a maximum of one month.*

PARACETAMOL = ACETAMINOPHEN (Perfalgan®, Perfusalgan®…)

Prescription under medical supervision

Therapeutic action

– Analgesic, antipyretic

Indications

– Very high fever, when oral administration is not possible
– Mild to moderate pain, when oral administration is not possible

Presentation and route of administration

– 500 mg vial (10 mg/ml, 50 ml), for infusion

Also comes in 1 g vial (10 mg/ml, 100 ml), for infusion

Dosage

– Neonate (child < 10 days): 7.5 mg/kg/infusion (0.75 ml/kg/infusion), to be administered over 15 minutes. Repeat 2 to 3 times/24 hours if necessary. Wait at least 4 hours between each infusion. Do not exceed 30 mg/kg/day.
– Infant and child: 15 mg/kg/infusion (1.5 ml/kg/infusion), to be administered over 15 minutes. Repeat 2 to 3 times/24 hours if necessary. Wait at least 4 hours between each infusion. Do not exceed 60 mg/kg/day.
– Adolescent and adult over 50 kg : 1 g/infusion (100 ml/infusion), to be administered over 15 minutes. Repeat 2 to 3 times/24 hours if necessary. Wait at least 4 hours between each infusion. Do not exceed 4 g/day.

Duration

– According to clinical response. Change to oral route as soon as possible.

Contra-indications, adverse effects, precautions

– Do not administer to patients with severe hepatic impairment.
– Administer with caution to patients with hepatic impairment, severe renal impairment (wait 6 hours between each infusion), chronic alcoholism, malnutrition, dehydration.
– May cause (rarely): malaise, hypotension, rash.
– Do not exceed indicated doses, especially in children and elderly patients. Paracetamol intoxications are severe (hepatic cytolysis).
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– For the treatment of mild to moderate pain, paracetamol is used alone or in combination with an NSAID.
– For the treatment of moderate to severe pain, paracetamol is used in combination with an NSAID and a weak opioid analgesic (codeine, tramadol) or a strong opioid analgesic (morphine, etc.).
– As the efficacy of IV paracetamol is not superior to the efficacy of oral paracetamol, the IV route is restricted to situations where oral administration is possible.
– Paracetamol has no anti-inflammatory properties.
– Do not mix with other drugs in the same infusion bottle.
– *Storage: below 30°C* – 

PENTAMIDINE
(Pentacarinat®, Pentam®…)

Prescription under medical supervision

Therapeutic action
– Antiprotozoal active against *Pneumocystis jiroveci* (*carinii*)

Indications
– Second-line treatment of pneumocystosis, in the event of contra-indication, intolerance or unresponsiveness to cotrimoxazole

Presentation and route of administration
– Powder for injection, 200 mg and 300 mg vials, to be dissolved in 10 ml water for injection, for IM injection or infusion in 250 ml of 5% glucose

Dosage and duration
– Child and adult: 4 mg/kg once daily by IM injection or slow infusion (over 60 minutes minimum) for 14 to 21 days

Contra-indications, adverse effects, precautions
– Do not administer to patients with severe renal impairment.
– Reduce dosage in patients with renal impairment.
– May cause:
  • aseptic abscess by IM route; venous thrombosis by IV route,
  • malaise, hypotension, particularly if administered too rapidly by IV route,
  • gastrointestinal disturbances; renal, hepatic and haematologic disorders; pancreatitis, arrhythmia, *torsades de pointes*, hypoglycaemia followed by hyperglycaemia.
– Do not combine with drugs inducing *torsades de pointes*: anti-arrhythmics, neuroleptics, tricyclic antidepressants, IV erythromycin, halofantrine, etc.
– Avoid combination with: mefloquine, cardiac glycosides, azole antifungals, drugs inducing hypokalaemia (diuretics, glucocorticoids, injectable amphotericin B, etc.).
– Administer on a empty stomach, keep the patient supine during injection and 30 min after.
– Monitor blood pressure, blood glucose level, serum creatinine level, blood counts.
– *Pregnancy and breast-feeding*: **CONTRA-INDICATED**, *except if vital and there is no therapeutic alternative*

Remarks
– For the prophylaxis of pneumocystosis, pentamidine may be used by inhalation of nebulised solution using suitable equipment.
– Pentamidine is also used in the treatment of African trypanosomiasis and leishmaniasis.
– *Storage: below 30°C –*
Once reconstituted, solution keeps for 24 hours maximum, between 2°C to 8°C.

PHENOBARBITAL
(Gardenal®, Luminal®…)

Prescription under medical supervision

Therapeutic action

– Anticonvulsant, sedative

Indications

– Status epilepticus: prolonged seizures or repeated seizures at short intervals without consciousness recovery

Presentation and route of administration

– 200 mg in 1 ml ampoule (200 mg/ml) for deep IM or slow and diluted IV injection

Also comes in 40 mg and 200 mg vial containing phenobarbital in powder to be dissolved in 2 ml water for injection.

Dosage

– Child: 15 to 20 mg/kg by slow IV injection
– Adult: 10 to 15 mg/kg by slow IV injection (at a rate of 100 mg/minute maximum)

Phenobarbital solution must be diluted: 1 ml in 10 ml water for injection.

Duration: according to clinical response

Contra-indications, adverse effects, precautions

– Do not administer in severe respiratory depression.
– Assisted ventilation is essential in case of respiratory distress.
– May cause: drowsiness, respiratory depression.
– Risk of increased sedation when combined with alcohol and drugs acting on the central nervous system such as diazepam, chlorphenamine, chlorpromazine.
– *Pregnancy and breast-feeding: risks linked to status epilepticus appear greater than risks linked to phenobarbital*

Remarks

– For febrile convulsions in children, use diazepam by parenteral or rectal route.
– In the treatment of status epilepticus, administer first diazepam (rapid effect) rectally or by slow IV route, then phenobarbital (prolonged effect) by slow IV route.
– Phenobarbital IM has been used for prophylaxis of convulsions in patients suffering from cerebral malaria, as a single dose of 5 to 7 mg. This use is being discussed; in addition, the optimal dose is not yet agreed upon.
– SC route may cause necrosis.
– Do not mix with other drugs in the same syringe.
– Warning: also comes in 200 mg in 2 ml ampoule (100 mg/ml). Before any injection, check concentration.
– Phenobarbital is subject to international controls: follow national regulations.
– *Storage:* no special temperature requirements –

PHYTOMENADIONE = VITAMIN K1

Prescription under medical supervision

Therapeutic action

– Vitamin, anti-haemorrhagic

Indications

– Prophylaxis and treatment of haemorrhagic disease of the newborn

Presentation and route of administration

– 1 mg ampoule (1 mg/ml, 1 ml), only for IM or slow IV injection
– 2 mg ampoule (10 mg/ml, 0.2 ml), for oral administration, IM or slow IV injection
– 10 mg ampoule (10 mg/ml, 1 ml), for oral administration, IM or slow IV injection

Dosage

– *Systematic prophylaxis of haemorrhagic disease of the newborn*

	IM route	Oral route
Breastfed infants	*Single dose:* 1 mg the day of birth	*3 doses:* 2 mg the day of birth 2 mg 4 to 7 days after birth 2 mg 4 weeks after birth
Formula fed infants	*Single dose:* 1 mg the day of birth	*2 doses:* 2 mg the day of birth 2 mg 4 to 7 days after birth

Prophylaxis by oral route is effective only if all the doses are administered. Therefore, use IM route systematically in all newborn infants if treatment compliance cannot be guaranteed.
In *newborns at high risk* (preterm neonates, jaundice, neonatal diseases; newborns whose mother is treated with enzyme-inducing drugs), always use IM route.

– *Treatment of haemorrhagic disease of the newborn*
1 mg by IM injection, to be repeated every 8 hours if necessary

Duration: according to clinical response and results of coagulation tests

Contra-indications, adverse effects, precautions

– May cause: allergic reactions, especially by IV route, haematoma at IM injection site.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– To pregnant women taking enzyme-inducing drugs (rifampicin, phenobarbital, phenitoin, carbamazepine), administer 10 mg/day orally for the 15 days prior to the expected date of delivery. This maternal prevention does not change the need for IM prophylactic treatment in newborns at high risk.
– Phytomenadione is also used for the treatment of haemorrhage due to antivitamin K agents: 5 mg by slow IV route in the event of severe haemorrhage; 0.5 mg by slow IV route or 5 mg orally in the event of minor haemorrhage or risk of haemorrhage.
– Vitamin K has no direct or immediate haemostatic action, it is not indicated for traumatic haemorrhage.
– Do not mix with other drugs in the same syringe.
– *Storage: below 25°C* – 

PROMETHAZINE
(Phenergan®…)

Prescription under medical supervision

Therapeutic action
– Sedating antihistaminic, anti-emetic

Indications
– Allergic reactions (contact dermatitis, seasonal allergy; allergy to drugs, insect bites, food, etc.), when oral administration is not possible
– Nausea and vomiting

Presentation and route of administration
– 50 mg in 2 ml ampoule (25 mg/ml) for IM injection

Dosage
– *Allergic reactions*
  Child from 5 to 10 years: 12.5 mg/injection
  Child over 10 years and adult: 25 to 50 mg/injection
  To be repeated if necessary without exceeding 3 injections/day.
– *Nausea and vomiting*
  Child from 5 to 10 years: 12.5 mg/injection
  Child over 10 years and adult: 25 mg/injection
  To be repeated if necessary every 4 to 6 hours.
– Never exceed 100 mg daily.

Duration
– According to clinical response, single dose or for a few days if necessary. Change to oral treatment as soon as possible.

Contra-indications, adverse effects, precautions
– Do not administer to patients with urethro-prostatic disorders, glaucoma.
– Avoid in children under 5 years.
– May cause: drowsiness, dryness of the mouth, constipation, urinary retention, blurred vision.
– Risk of increased sedation when combined with alcohol and drugs acting on the central nervous system: opioid analgesics, neuroleptics (chlorpromazine, haloperidol, etc.), other antihistamines (chlorphenamine), antidepressants (clomipramine, fluoxetine, etc.), phenobarbital, etc.
– *Pregnancy: avoid at the end of pregnancy; no prolonged treatment*
– *Breast-feeding: not recommended (drowsiness and risk of apnoea in the newborn infant)*

Remarks
– *Storage: below 25°C –*

PROTAMINE
(Prosulf®…)

Prescription under medical supervision

Therapeutic action

– Neutralisation of the anticoagulant action of heparin

Indications

– Haemorrhage resulting from heparin overdosage

Presentation and route of administration

– 50 mg protamine sulfate in 5 ml ampoule (10 mg/ml) for slow IV injection

Dosage may be expressed in antiheparin units: 1000 antiheparin units/ml = 10 mg/ml

Dosage

Depends on the amount of heparin to be neutralised.

– Adult: 1 mg protamine sulfate by slow IV injection neutralises 100 IU of heparin when administered less than 15 minutes after heparin. If protamine sulfate is given 30 minutes after heparin, reduce the dose by one-half because heparin is rapidly excreted.
  Do not inject more than 50 mg for any one dose.

Duration: according to clinical response. Closely monitor coagulation parameters.

Contra-indications, adverse effects, precautions

– May cause: hypotension, bradycardia, dyspnoea.
– Risk of allergic reactions in diabetics treated by protamine-insulin.
– Overdosage may cause a rebond bleeding effect (protamine sulfate has an anticoagulant effect when used in excess).
– Administer very slowly by IV injection (over 10 minutes) in order to avoid risk of hypotension and bradycardia.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Anticoagulant effect of protamine may depend on origin of heparin: follow manufacturer's recommendations.
– Protamine sulfate may be used to neutralize the effect of heparin before surgery and during extracorporeal circulation (dialysis, cardiac surgery).
– *Storage: to be kept refrigerated (2°C to 8°C)* –

QUININE

Prescription under medical supervision

Therapeutic action

– Antimalarial

Indications

– Treatment of severe falciparum malaria

Presentation and route of administration

– 600 mg of quinine dihydrochloride in 2 ml ampoule (300 mg/ml), to be diluted in 5% glucose, for slow infusion. NEVER FOR IV INJECTION.

Dosage

The dosage is expressed in terms of salt; it is the same for quinine dihydrochloride or for quinine formate:

– Child and adult:
  • loading dose: 20 mg/kg administered over 4 hours, then keep the vein open with an infusion of 5% glucose over 4 hours
  • maintenance dose: 8 hours after the start of the loading dose, 10 mg/kg every 8 hours (alternate quinine over 4 hours and 5% glucose over 4 hours)

For adults, administer each dose of quinine in 250 ml. For children under 20 kg, administer each dose of quinine in a volume of 10 ml/kg.

Do not administer a loading dose to patients who have received oral quinine, mefloquine or halofantrine within the previous 24 hours: start with maintenance dose.

Duration

– As soon as the patient is able to take oral treatment, administer either oral quinine to complete 7 days of treatment or an artemisinin-based combination (if patient developed neurological signs during the acute phase, do not use the combination artesunate-mefloquine).

Contra-indications, adverse effects, precautions

– May cause: hypoglycaemia; auditory and visual disturbances, cardiac disorders (especially in the event of overdose), hypersensitivity reactions, cardiac depression if injected undiluted by direct IV route.
– In patients with acute renal failure, reduce the dose by one-third if the parenteral treatment lasts more than 48 hours.
– Monitor blood glucose (reagent strip test).
– Do not combine with chloroquine or halofantrine.
– Do not administer simultaneously with mefloquine (risk of seizures, cardiac toxicity). Administer mefloquine 12 hours after the last dose of quinine.
– *Pregnancy: no contra-indication. The risk of quinine-related hypoglycaemia is very high in pregnant women.*
– *Breast-feeding: no contra-indication*

Remarks

– 10 mg quinine dihydrochloride = 8 mg quinine base.
– Administration by IM deep injection (into the anterior thigh only) is possible when infusion cannot be performed (e.g. before transferring a patient). However this may cause numerous complications. Doses are the same as for the IV route. Quinine should be diluted (1/2 or 1/5). For the loading dose, administer half the dose into each thigh.
– In certain regions of South-East Asia, quinine is combined with doxycycline or clindamycin, due to a reduction in *P. falciparum* sensitivity to quinine.
– *Storage: below 30°C –*

SALBUTAMOL = ALBUTEROL
(Salbumol®…)

Prescription under medical supervision

Therapeutic action
– Uterine relaxant

Indications
– Threatened premature labour

Presentation and route of administration
– 0.25 mg in 5 ml ampoule (0.05 mg/ml) for SC, IM, slow IV injection or infusion

Also comes in 1 ml ampoule containing 0.5 mg (0.5 mg/ml) and 5 ml ampoule containing 5 mg (1 mg/ml).

Dosage
– Dilute 5 mg (10 ampoules of 0.5 mg) in 500 ml of 5% glucose or 0.9% sodium chloride to obtain a solution of 10 micrograms/ml.
Start infusion at the rate of 15 to 20 micrograms/minute (30 to 40 drops/minute).
If contractions persist, increase the rate by 10 to 20 drops/minute every 30 minutes until uterine contractions cease. Do not exceed 45 micrograms/minute (90 drops/minute).
Continue for one hour after contractions have ceased, then reduce the rate by half every 6 hours.
Monitor maternal pulse regularly, decrease the infusion rate in the event of maternal tachycardia > 120/minute.

Duration
– 48 hours maximum

Contra-indications, adverse effects, precautions
– Do not administer to patients with pre-eclampsia, eclampsia, uterine haemorrhage, intra-uterine infection, intra-uterine foetal death, placenta praevia, placental abruption, rupture of membranes, multiple pregnancy; severe cardiopathy, uncontrolled hypertension.
– Do not combine with nifedipine.
– May cause: foetal and maternal tachycardia, tremor, headache, dizziness, hypokalaemia, hyperglycaemia, gastrointestinal disturbances.
– Administer with caution to patients with diabetes, hyperthyroidism.
– *Pregnancy: no contra-indication*
– *Breast-feeding: avoid*

Remarks
– Do not mix with other drugs in the same syringe or the same infusion fluid.
– *Storage: below 25°C* –

SPECTINOMYCIN
(Kempi®, Stanilo®, Trobicin®…)

Prescription under medical supervision

Cephalosporins are the first choice treatment of gonococcal infections. Spectinomycin may be used as an alternative, when cephalosporins are not available or are contraindicated.

Therapeutic action

– Antibacterial (group of aminoglycosides)

Indications

– Second choice treatment of gonococcal infections

Presentation and route of administration

– Powder for injection in 2 g vial, to be dissolved with the diluent supplied by the manufacturer (3.2 ml ampoule of water for injection with benzyl alcohol), for IM injection

Dosage and duration

– *Anogenital gonococcal infection* and *gonococcal conjunctivitis*
Adult: 2 g as a single dose (a dose of 4 g may be required, divided between two sites)

– *Disseminated gonococcal infection*
Adult: 4 g/day in 2 divided doses for 7 days

Contra-indications, adverse effects, precautions

– May cause: nausea, dizziness, fever and chills, urticaria; pain at injection site.
– *Pregnancy: CONTRA-INDICATED (safety is not established)*
– *Breast-feeding: no contra-indication for a single dose treatment*

Remarks

– Administer a concurrent anti-chlamydia treatment to patients with gonococcal infections (co-infections are frequent).
– Spectinomycin is poorly effective against pharyngeal gonococcal infections.
– For the treatment of neonatal gonococcal conjunctivitis, use cephalosporins.
– Shake well prior to withdrawal medication and use a 19-gauge needle.
– Do not mix with other drugs in the same syringe.
– *Storage: below 30°C*

STREPTOMYCIN

Prescription under medical supervision

Therapeutic action

– Antibacterial (group of aminoglycosides)

Indications

– Tuberculosis, *in combination with other antituberculous antibacterials*

Presentation and route of administration

– Powder for injection, vial containing 1 g of streptomycin base, to be dissolved in 5 or 10 ml of water for injection, for IM injection. NEVER FOR IV INJECTION.

Dosage

– Child and adult: 15 mg/kg once daily; maximum 1 g/day

Weight	1 g vial dissolved in 10 ml		1 g vial dissolved in 5 ml	
	Dose in g	Dose in ml	Dose in g	Dose in ml
≤ 9 kg	0.2	2 ml	–	–
10 to 14 kg	0.25	2.5 ml	–	–
15 to 19 kg	–	–	0.3 g	1.5 ml
20 to 34 kg	–	–	0.5 g	2.5 ml
35 to 39 kg	–	–	0.6 g	3 ml
40 to 49 kg	–	–	0.8 g	4 ml
50 to 54 kg	–	–	0.9 g	4.5 ml
> 55 kg	–	–	1 g	5 ml

Duration: according to protocol

Contra-indications, adverse effects, precautions

– Do not administer to patients with renal impairment.
– May cause: vestibular and auditory damage, renal impairment and hypersensitivity reactions.
– Due to the ototoxicity and nephrotoxicity of streptomycin, do not exceed a total dose of 60 g for the treatment of tuberculosis in adults.
– Stop treatment in the event of dizziness, persistent giddiness, tinnitus or hearing defects.
– Reduce the dose to 500-750 mg/day in patients over 60 years or under 50 kg and if renal impairment occurs (albuminuria, decreased urine output).
– *Pregnancy: **CONTRA-INDICATED***
– *Breast-feeding: no contra-indication*

Remarks

– Streptomycin is also used in the treatment of:
  • Brucellosis: 15 mg/kg once daily in children and 1 g once daily in adults, for 2 weeks, in combination with doxycycline for 6 weeks.
  • Plague: 30 mg/kg/day in children and 2 g/day in adults, divided into 2 daily injections, for 7 to 10 days.
– *Storage: below 25°C –*
Reconstituted solution can be kept 24 hours maximum, below 25°C and protected from light.

SURAMIN
(Germanin®…)

Prescription under medical supervision

Therapeutic action
– Trypanocide

Indications
– Haemolymphatic stage of African trypanosomiasis due to *T. b. rhodesiense*

Presentation and route of administration
– Powder for injection in 1 g vial, to be dissolved in 10 ml of water for injection to obtain a 10% solution, for slow IV injection (or slow infusion in 500 ml of 0.9% NaCl). NEVER BY IM OR SC INJECTION.

Dosage
– Patients must be treated in hospital, under close medical supervision.
– Child and adult: 4 to 5 mg/kg by slow IV at D1 (test dose) then, in the absence of reaction after the test dose, 20 mg/kg by slow IV at D3, D10, D17, D24 and D31 (max. 1 g/injection)

Contra-indications, adverse effects, precautions
– Do not administer in patients with severe renal or hepatic disease.
– May cause:
  • anaphylactic reaction: administer a test dose before starting treatment. In the event of anaphylactic reaction, the patient should never receive suramin again.
  • proteinuria (renal toxicity), diarrhoea, haematological disorders (haemolytic anaemia, agranulocytosis, etc.), eye disorders (photophobia, lachrymation), neurological disorders (paraesthesia, hyperaesthesia of the palms and soles, polyneuropathy), high fever, skin eruption, malaise, intense thirst, polyuria.
  • local inflammation and necrosis when administered by IM or SC injection.
– Before each injection, check for proteinuria: moderate proteinuria is common at the start of treatment, heavy proteinuria calls for dose reduction and modification of treatment schedule; in the event of persisting heavy proteinuria, treatment should be discontinued.
– Ensure that the patient is well hydrated.
– *Pregnancy: although suramin is toxic, it is recommended to treat pregnant women with rhodesiense trypanosomiasis at the haemolymphatic stage. Suramin is also used at the meningoencephalitic stage until the woman can be given melarsoprol after delivery, as melarsoprol is contra-indicated during pregnancy.*

Remarks
– Suramin is not administered at the meningoencephalitic stage (except in pregnant women) as it poorly penetrates into the cerebrospinal fluid.
– Due to its toxicity, suramin is no longer used for the treatment of onchocerciasis.
– *Storage:* 

THIAMINE = VITAMIN B1
(Benerva®, Betaxin®…)

Therapeutic action

– Vitamin

Indications

– Initial treatment of severe thiamine deficiency: severe acute forms of beriberi, neurological complications of chronic alcoholism (severe polyneuritis, Wernicke's encephalopathy, Korsakoff syndrome)

Presentation and route of administration

– 100 mg thiamine hydrochloride in 2 ml ampoule (50 mg/ml) for IM or very slow IV injection

Dosage and duration

– *Infantile beriberi*
  25 mg by IV injection then, 25 mg by IM injection once or twice daily then, change to oral route (10 mg/day) as soon as symptoms have improved.
– *Acute beriberi*
  50 mg as a single IM injection then change to oral treatment (150 mg/day in 3 divided doses until symptoms improve then, 10 mg once daily)
  or, depending on severity, 150 mg/day in 3 IM injections for a few days then change to oral route (10 mg/day).
– *Wernicke's encephalopathy, Korsakoff syndrome*
  250 mg once daily by IV injection until the patient can take oral treatment. Higher initial doses may be required during the first 12 hours.

Contra-indications, adverse effects, precautions

– May cause: hypotension; anaphylactic reaction, especially when injected IV (inject very slowly over 30 minutes).
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Thiamine is also called aneurine.
– Injectable thiamine is not included in the WHO list of essential medicines.
– *Storage:* 

TRAMADOL
(Tramal®, Zamadol®, Zydol®…)

Prescription under medical supervision

Therapeutic action
– Centrally acting analgesic (weak opioid, serotonin-norepinephrine reuptake inhibitor)

Indications
– Moderate acute pain

Presentation and route of administration
– 100 mg ampoule (50 mg/ml, 2 ml) for SC, IM, slow IV injection or infusion

Dosage
– Child over 6 months: 2 mg/kg/injection every 6 hours
– Adult: 50 to 100 mg/injection every 4 to 6 hours, without exceeding 600 mg/day

Duration: change to oral route as soon as possible.

Contra-indications, adverse effects, precautions
– Do not administer in the event of severe respiratory depression and to patients that risk seizures (e.g. epilepsy, head injury, meningitis).
– May cause:
  • dizziness, nausea, vomiting, drowsiness, dry mouth, sweating;
  • rarely: allergic reactions, seizures, confusion;
  • exceptionally: withdrawal symptoms; respiratory depression in the event of overdosage.
– Do not combine with opioid analgesics, including codeine.
– Avoid combination with carbamazepine, fluoxetine, chlorpromazine, promethazine, clomipramine, haloperidol, digoxin.
– Reduce doses (1 mg/kg) and administer every 12 hours in elderly patients and in patients with severe renal or hepatic impairment (risk of accumulation).
– For IV administration, it is better to use tramadol by infusion over 20-30 minutes rather than by IV injection, in order to limit adverse effects.
– *Pregnancy and breast-feeding: no contra-indication. The child may develop adverse effects (drowsiness) when the mother receives tramadol at the end of the 3rd trimester and during breast-feeding. In these events, administer with caution, for a short period, at the lowest effective dose, and monitor the child.*

Remarks
– Tramadol is approximately 10 times less potent than morphine.
– In some countries, tramadol is on the list of narcotics: follow national regulations.
– *Storage:*

Infusion fluids and electrolytes

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Use of infusion fluids

Choice of infusion fluids according to indications

3 kinds of infusion fluids should be available:

– For IV rehydration: Ringer Lactate is the most suitable.

– For administration of IV drugs: 5% glucose solution and 0.9% sodium chloride solution are the most suitable.

– For volume expansion: see table next page.

Precautions for the use of infusion fluids

– Carefully read the labels on the infusion bottle to avoid mistakes.

– Indicate on the label any drugs added to the infusion as well as the patient's name and/or bed number.

– If drugs are added to the intravenous fluid, think of the risks of:
  • physical and chemical incompatibilities,
  • microbial contamination: aseptic technique.

– Examine each bottle against the light to check clearness. Discard any bottles that show particles in suspension or cloudiness.

Volume expanders

	Duration*	Volume	Dosage	Indications	Contra-indications	Advantages	Disadvantages
CRISTALLOIDS							
Ringer Lactate NaCl 0.9 %	1 to 2 hours	3 times the estimated fluid loss	According to patient's condition	- Hypovolaemia - Prevention of hypotension induced by spinal anaesthesia	- None	- Free from adverse effects - Inexpensive	- Large amounts to be infused rapidly - Expansion of short duration
COLLOIDS							
Polygeline Modified fluid gelatin	2 to 3 hours	1 to 1.5 times the estimated fluid loss	According to patient's condition	- Hypovolaemia	- Allergy to gelatins	- Relatively good volume expansion	- Allergic reactions - Expansion of short duration - Expensive

*** Length of time during which the fluid remains in the intravascular compartment after infusion.**

For more information, refer to relevant fact-sheet.

GLUCOSE 5% = DEXTROSE 5%

Indications

– Vehicle for the administration of parenteral drugs

Composition and presentation

– Isotonic solution (50 mg of glucose/ml) for infusion
– 500 ml and 1000 ml bottles or bags

Contra-indications, adverse effects, precautions

– Do not use glucose solution for the administration of hydralazine (incompatibility, rapid degradation of hydralazine): use only 0.9% sodium chloride or Ringer Lactate solution.
– Other drugs such as amoxicillin + clavulanic acid, aciclovir, phenytoin, bleomycin or chloroquine must also be administered in 0.9% sodium chloride solution.
– Amoxicillin diluted in 5% glucose must be administered in less than one hour. If infusion over more than one hour is required, use 0.9% sodium chloride.

Remarks

– This solution does not contain electrolytes or lactate. Its use is not recommended for the IV treatment of dehydration. Use Ringer Lactate solution. If not available, add KCl (2 g/litre) + NaCl (4 g/litre) to 5% glucose.
– 10% glucose solution may be used for the administration of the loading dose of IV quinine in order to prevent hypoglycaemia. If 10% glucose solution is not available, it can be prepared using 10 ml of 50% glucose per 100 ml of 5% glucose.
– Low nutritional value: 200 kcal/litre.
– *Storage: below 30°C*

GLUCOSE 10% = DEXTROSE 10%

Indications

- Emergency treatment of severe hypoglycaemia
- Vehicle for the administration of the loading dose of IV quinine

Composition and presentation

- Hypertonic solution (100 mg of glucose/ml) for slow IV injection or infusion
- 500 ml bottle or bag

Contra-indications, adverse effects, precautions

- Do not administer by IM or SC route.

Remarks

- The dose in severe hypoglycaemia is 5 ml/kg by very slow IV injection (over 5 minutes) or infusion.
- In neonatal hypoglycaemia, 10% glucose is administered by infusion at a rate of 5 ml/kg/hour. In addition, a loading of 2.5 ml/kg IV is administered slowly (over 5 minutes) in the event of loss of consciousness or seizures.
- 10% glucose solution may be used as vehicle for administration of the loading dose of IV quinine in order to prevent hypoglycaemia. However, the following doses must be administered in 5% glucose solution.
- Nutritional value: 400 kcal/litre.
- *Storage: below 30°C*

MODIFIED FLUID GELATIN (Gelofusine®, Plasmion®...) and POLYGELINE (Haemaccel®…) solution for INFUSION

Prescription under medical supervision

Therapeutic action
– Colloidal plasma substitute

Indications
– Fluid replacement in hypovolaemic shock (haemorrhagic shock, septic shock)

Presentation
– 500 ml plastic bottle or bag

Composition
– Varies according to the manufacturer. Example:

	Plasmion®	**Haemaccel®**
Modified fluid gelatin	30 g/litre	–
Polygeline	–	35 g/litre
Sodium (Na^+)	150 mmol (*150 mEq*)	145 mmol (*145 mEq*)
Potassium (K^+)	5 mmol (*5 mEq*)	5.10 mmol (*5.10 mEq*)
Calcium (Ca^{++})	–	6.25 mmol (*12.50 mEq*)
Chloride (Cl^-)	100 mmol (*100 mEq*)	145 mmol (*145 mEq*)
Magnesium (Mg^{++})	1.5 mmol (*3 mEq*)	–
Lactate	30 mmol (*30 mEq*)	–

Dosage
– Adjust dosage according to the patient's haemodynamic status.
– In the event of haemorrhage, replace the lost volume by the same volume of plasma substitute.

Contra-indications, adverse effects, precautions
– May cause: allergic reactions, possibly severe (anaphylactic shock).
– *Pregnancy: CONTRA-INDICATED: risk of maternal anaphylactic reaction with serious consequences for the foetus. Use Ringer lactate.*

Remarks
– Do not add any drugs to the bottle.
– When plasma substitutes are not available, use Ringer lactate (giving 3 times the lost blood volume).
– *Storage: below 25°C*

POTASSIUM CHLORIDE 10%

hypertonic solution in AMPOULE

Prescription under medical supervision

Indications

– Prevention and treatment of severe hypokalaemia

Presentation

– 1 g in 10 ml ampoule (potassium chloride 10%)
– 2 g in 20 ml ampoule (potassium chloride 10%)

Also comes in 10 ml and 20 ml ampoules containing 7.5%, 11,2%, 15% and 20% solutions.

Composition

Potassium chloride: 10 g per 100 ml

– Hypertonic solution
– Ionic composition:

potassium (K^+): 13.4 mmol per 10 ml ampoule (*13.4 mEq*)
26.8 mmol per 20 ml ampoule (*26.8 mEq*)
chloride (Cl^-) : 13.4 mmol per 10 ml ampoule (*13.4 mEq*)
26.8 mmol per 20 ml ampoule (*26.8 mEq*)

Contra-indications, adverse effects, precautions

– Do not administer hypertonic solution by direct IV, IM or SC route. Administer only by slow infusion **diluted** in glucose 5%.
– Do not exceed 1 to 2 g KCl/hour (13 to 27 mmol/hour).
– May cause: ventricular arrhythmia when injected too rapidly.
– Administer with caution to elderly patients and to patients suffering from renal failure.

Remarks

– Normal plasma-potassium concentration is about 3.5 to 5 mmol per litre. Normal daily needs are about 40 mmol.
– May be used to prepare a solution for IV rehydration (if Ringer Lactate is not available): add KCl (2 g/l) + NaCl (4 g/l) in glucose 5%.
– *Storage:* no special temperature requirements

RINGER LACTATE = COMPOUND SODIUM LACTATE
= Hartmann's solution
isotonic solution for INFUSION

Indications
- Severe dehydration
- Hypovolaemia (trauma, surgery, anaesthesia...)

Presentation
- 500 ml and 1000 ml bottles or bags

Composition
- Varies with manufacturer.
- Most frequent ionic composition per litre:

sodium (Na^+):	130.50 mmol	(*130.50 mEq*)
potassium (K^+):	4.02 mmol	(*4.02 mEq*)
calcium (Ca^{++}):	0.67 mmol	(*1.35 mEq*)
chloride (Cl^-):	109.60 mmol	(*109.60 mEq*)
lactate:	28.00 mmol	(*28.00 mEq*)

- Isotonic solution. Does not contain glucose.

Contra-indications, adverse effects, precautions, remarks
- In cases of metabolic alkalosis, diabetes, severe hepatic failure, head injury: isotonic solution of NaCl 0.9% is preferred.
- Ringer Lactate provides appropriate amounts of sodium and calcium. It contains lactate which is converted to bicarbonate for correction of metabolic acidosis when it exists (if haemodynamic and liver function are normal). WARNING, SOME COMMERCIALLY AVAILABLE SOLUTIONS DO NOT CONTAIN LACTATE.
- It contains 4 mEq of potassium/litre, which is sufficient for short-term use. For prolonged use (after 2 to 3 days), addition of potassium chloride is necessary: 1 or 2 g per litre = one to two 10 ml ampoules of KCL 10%/litre.
- For moderate and mild dehydration, administer oral rehydration salts (ORS).
- For correction of hypovolaemia due to haemorrhage; administer 3 times the lost volume only if:
  - cardiac and renal function are not impaired,
  - blood loss does not exceed 1500 ml in adults.
- May be used to prevent hypotension induced by spinal anaesthesia.
- *Storage: below 30°C*

SODIUM BICARBONATE 8.4%
hypertonic solution in AMPOULE

Prescription under medical supervision

Indications
– Severe metabolic acidosis

Presentation
– 10 ml or 20 ml ampoule

Composition
Sodium bicarbonate in hypertonic solution: 8.4 g per 100 ml
– Ionic composition: sodium (Na^+) : 10 mmol (*10 mEq*) per 10 ml ampoule
bicarbonate : 10 mmol (*10 mEq*) per 10 ml ampoule

Contra-indications, adverse effects, precautions, remarks
– Do not use in case of alkalosis or respiratory acidosis.
– Do not administer hypertonic solutions by IM or SC route. Administer under close medical supervision, by slow direct IV injection **diluted** in 5% glucose or by continuous infusion in 5% glucose.
– Contains a high concentration of bicarbonate and sodium ions. Its use is rarely justified in case of metabolic acidosis caused by dehydration. Inaccurate administration may induce hypernatraemia and hypokalaemia.
– Do not add: penicillins, chloramphenicol, aspirin, atropine, calcium, insulin, vitamins, etc. to sodium bicarbonate solution.
– *Storage: below 30°C*

SODIUM CHLORIDE 0.9% = NaCl = Physiological saline

Indications

- Vehicle for the administration of parenteral drugs
- Fluid replacement

Composition and presentation

- Isotonic solution of sodium chloride (0.9 g per 100 ml) for infusion
- Ionic composition: sodium (Na^+): 150 mmol per litre (*150 mEq*)
  chloride (Cl^-): 150 mmol per litre (*150 mEq*)
- 250 ml and 1000 ml bottles or bags

Contra-indications, adverse effects, precautions

- Use with caution in patients with hypertension, heart failure, oedema, ascites due to cirrhosis, renal impairment and other conditions associated with sodium retention.
- May cause: pulmonary oedema in the event of too rapid infusion or infusion of excessive amounts.
- Do not use as vehicle for the administration of amphotericin B (incompatibility): use only 5% glucose solution.

Remarks

- For correction of hypovolaemia due to haemorrhage, administer 3 times the lost volume only if:
  - blood loss does not exceed 1500 ml in adults,
  - cardiac and renal function are not impaired.
- 0.9% sodium chloride solution may be used to prevent hypotension induced by spinal anaesthesia.
- This solution contains neither potassium nor lactate. In case of severe dehydration, use Ringer Lactate. If Ringer Lactate is not available, add KCl (2 g/l) + NaCl (4 g/l) to 5% glucose.
- For external use: sterile 0.9% sodium chloride solution is used for cleansing of non-infected wounds, wound irrigation, eye cleansing (conjunctivitis, eye irrigations), nasal lavage in the event of obstruction, etc.
- *Storage: below 30°C*

Vaccines, immunoglobulins and antisera

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ANTITUBERCULOUS VACCINE = BCG VACCINE

Indications

– Prevention of tuberculosis

Composition, presentation and route of administration

– Live attenuated bacterial vaccine
– Powder for injection in multidose vial, to be dissolved with the entire vial of the diluent supplied by the manufacturer, for intradermal injection into the external face of the left upper arm

Dosage and vaccination schedule

– Child: 0.05 ml as a single dose as soon after birth as possible
– If child is over one year old: 0.1 ml as a single dose

Contra-indications, adverse effects, precautions

– Do not administer to patients with immunodeficiency (symptomatic HIV infection, immunosuppressive therapy, etc.) and malignant haemopathy.
– Vaccination should be postponed in the event of evolutive extensive dermatosis, acute complicated malnutrition (vaccine should be given just before the child is discharged from the nutrition centre) and severe acute febrile illness (minor infections are not contra-indications).
– May cause:
  • normal local reaction 2 to 4 weeks after injection: papule which changes to an ulcer, that usually heals spontaneously (dry dressing only), leaving a permanent scar;
  • occasionally: persistent ulcer with serous discharge up to 4 months after injection, non-suppurative adenitis, keloid formation, abscess at the injection site;
  • exceptionally: suppurative lymphadenitis, osteitis.
– Clean the injection site with boiled and cooled water and allow drying. Do not use antiseptics (risk of inactivation of live vaccine).
– Do not mix with other vaccines in the same syringe (inactivation of vaccines).
– If administered simultaneously with EPI vaccines, use different syringes and injection sites.
– *Pregnancy*: ***CONTRA-INDICATED***
– *Breast-feeding*: *no contra-indication*

Remarks

– Inject the vaccine in the same place for each child to make it easy to find the BCG scar subsequently.
– If the injection is correctly performed an "orange-skin" papule, measuring 5-8 mm in diameter, should appear at the injection site.
– Duration of protection is not known, and decreases over time.
– *Storage*: 
  • *Powder: between 2°C and 8°C. Freezing is possible but unnecessary.*
  • *Diluent: a cold chain is not required for storage. However, at least 12 hours before reconstitution of the vaccine, the diluent must be refrigerated between 2°C and 8°C so that the diluent and lyophilised powder are at the same temperature: a temperature difference during reconstitution may reduce vaccine efficacy. Do not freeze.*
  • *Reconstituted vaccine: between 2°C and 8°C for 4 hours maximum.*

DIPHTHERIA-TETANUS-PERTUSSIS VACCINE (DTP)

Indications

– Prevention of diphtheria, tetanus and pertussis in children under 7 years (primary vaccination)

Composition, presentation and route of administration

– Trivalent vaccine combining diphtheria toxin, tetanus toxin and whole-cell (DTwP) or acellular (DTaP) pertussis vaccine
– Suspension for injection in multidose vial, for IM injection into the anterolateral part of the thigh

Dosage and vaccination schedule

– Child: 0.5 ml/injection
– 3 injections in infancy (age < 1 year), with an interval of 4 weeks between each injection. It is recommended to administer the 1st dose at 6 weeks of age, the 2nd dose at 10 weeks of age and the 3rd dose at 14 weeks of age. If a child has not been vaccinated at 6 weeks of age, start vaccination as soon as possible.
– For booster doses, use DTP or DT or Td vaccine, depending on age.

Contra-indications, adverse effects, precautions

– Do not administer in the event of significant reactions to a previous dose of DTP vaccine or evolving neurological disease (encephalopathy, uncontrolled epilepsy): in both cases, use DT vaccine.
– Vaccination should be postponed in the event of severe acute febrile illness (minor infections are not contra-indications).
– Do not administer into the gluteal region.
– May cause:
  • mild reactions at the injection site: swelling, redness and pain;
  • general reactions: fever within 24 hours after injection;
  • rarely: anaphylactic reactions, seizures.
– Respect an interval of 4 weeks between each dose.
– Shake before use to homogenise the vaccine.
– Do not mix with other vaccines in the same syringe (inactivation of vaccines).
– If administered simultaneously with EPI vaccines, use different syringes and injection sites.

Remarks

– If the vaccination is interrupted before the complete series has been administered, it is not necessary to start again from the beginning. Continue the vaccination schedule from where it was interrupted and complete the series as normal.
– There are two bivalent vaccines containing diphtheria and tetanus toxins:
  • **diphtheria-tetanus vaccine** (**DT**), used for children < 7 years for booster doses, or when pertussis vaccine is contra-indicated, or after a significant reaction to a previous dose of DTP;
  • **tetanus-diphtheria vaccine** with low dose diphtheria toxoid (**Td**), used for primary vaccination and booster doses in children ≥ 7 years, adolescents and adults.
– There is also a quadrivalent vaccine against diphtheria, tetanus, pertussis and hepatitis B.
– There is also a pentavalent vaccine against diphtheria, tetanus, pertussis, hepatitis B and *Haemophilus influenzae*.
– *Storage: between 2°C and 8°C. Do not freeze.* 

HEPATITIS B VACCINE

Indications

– Prevention of hepatitis B

Composition, presentation and route of administration

– There are 2 types of vaccines: recombinant vaccines (Engerix B®, GenHevac B®, HBvaxpro®, etc.) and human plasma-derived vaccines (Heptavax®, etc.)
– Solution for injection, in single-dose syringe or multidose vial, for IM injection into the deltoid muscle (into the anterolateral part of the thigh in children under 2 years)

Dosage and vaccination schedule

Dosage varies according to age and type of vaccine used: follow manufacturer's instructions.

– *Standard schedule*
  • Newborns and infants:
    In countries where perinatal infection is common: one injection after birth, then at 6 and 14 weeks
    Where perinatal infection is less common: one injection at 6, 10 and 14 weeks
  • Children, adolescents, adults:
    Schedule 0-1-6: 2 injections 4 weeks apart, then a 3rd injection 5 months after the 2nd injection

  Immunity develops 1 to 2 months after the 3rd injection. Vaccine efficacy is > 80%.
– *Accelerated schedules, when rapid protection is required (imminent departure in highly endemic areas, post-exposure prophylaxis)*
  • Schedule D0-D7-D21: 3 injections administered during the same month, then a 4th injection one year after the 1st injection
  • Schedule 0-1-2-12: 3 injections 4 weeks apart, then a 4th injection one year after the 1st injection

Contre-indications, effets indésirables, précautions

– Do not administer to patients with hypersensitivity to any component of the vaccine, or history of an allergic reaction to a previous injection. Vaccination should be postponed in the event of severe acute febrile illness. Minor infections are not contra-indications.
– Do not administer into the gluteal region (diminished antibody response to vaccine).
– In patients with multiple sclerosis, assess the benefit-risk balance of vaccination.
– May cause:
  • minor local or general reactions (pain or redness at injection site, fever, headache, myalgia, etc.),
  • very rarely: anaphylactic reaction, serum disease, lymphadenopathy, peripheral neuropathy.
– Shake before use to homogenise the vaccine.
– Do not mix with other vaccines in the same syringe (inactivation of vaccines).
– If administered simultaneously with EPI vaccines, use different syringes and injection sites.
– *Pregnancy: only administer if there is a high risk of contamination*
– *Breast-feeding: no contra-indication*

Remarks

– If the vaccination schedule is interrupted before the complete series has been administered, it is not necessary to start again from the beginning. Continue the vaccination schedule from where it was interrupted and complete the series as normal.
– SC route may be used, only if IM route is contra-indicated.
– *Storage: between 2°C and 8°C - Do not freeze.* 

JAPANESE ENCEPHALITIS VACCINE

Indications

– Prevention of Japanese encephalitis:
  • in children from 1 year and adults in endemic countries (rural areas of Southeast and Southwest Asia and Western Pacific countries)
  • in travellers spending more than 1 month in endemic countries, in rural areas and during the wet season

Composition, presentation and route of administration

– Inactivated virus vaccine
– Powder for injection in single-dose vial, to be dissolved with the entire vial of the diluent supplied by the manufacturer, for SC injection

Dosage and vaccination schedule

– Child from 1 to 3 years: 0.5 ml/injection
– Child over 3 years and adult: 1 ml/injection

There are several vaccination schedules, follow national recommendations.
For information, the following schedule is recommended for travellers:
3 injections on Day 0, Day 7 and Day 28; a booster dose every 3 years if risk persists.
An accelerated schedule is possible (3 doses on Day 0, Day 7 and Day 14) but this is likely to result in lower antibody levels than the standard schedule.
The 3rd dose should be given at least 10 days before departure to ensure an adequate immune response and access to medical care in the event of adverse reactions.

Contra-indications, adverse effects, precautions

– Do not administer to children < 1 year of age.
– Do not administer to patients with history of an allergic reaction to a previous injection of Japanese encephalitis vaccine.
– Vaccination should be postponed in the event of severe acute febrile illness (minor infections are not contra-indications).
– May cause:
  • minor local reactions (redness and swelling at the injection site);
  • systemic reactions: fever, headache, rash, chills, dizziness, myalgia, gastrointestinal disturbances;
  • hypersensitivity reactions (urticaria, angioedema), immediate or delayed (up to 2 weeks after injection);
  • rarely: encephalitis, encephalopathy.
– Do not mix with other vaccines in the same syringe (inactivation of vaccines).
– If administered simultaneously with EPI vaccines, use different syringes and injection sites.
– *Pregnancy: only administer if there is a high risk of contamination.*
– *Breast-feeding: no contra-indication*

Remarks

– Protection lasts at least 2 years after 3 doses.
– *Storage:* 
  • *Powder: between 2°C and 8°C. Do not freeze.*
  • *Diluent: a cold chain is not required for storage. However, at least 12 hours before reconstitution of the vaccine, the diluent must be refrigerated between 2°C and 8°C so that the diluent and lyophilised powder are at the same temperature: a temperature difference during reconstitution may reduce vaccine efficacy. Do not freeze.*
  • *Reconstituted vaccine: between 2°C and 8°C, for 6 hours maximum.*

MEASLES VACCINE

Indications

– Prevention of measles

Composition, presentation and route of administration

– Live-attenuated virus vaccine, derived from different viral strains. The strains most commonly used are Schwarz and Edmonston (check national recommendations).
– Powder for injection in single multidose vial, to be dissolved with the entire vial of the diluent supplied by the manufacturer, for IM or SC injection into the anterolateral part of the thigh or into the deltoid muscle

Dosage and vaccination schedule

– Children from 9 months of age: 0.5 ml as a single dose
– In situations where there is high risk of infection (overcrowding, epidemics, malnutrition, HIV infection, etc.) administer 2 doses: a first dose from 6 months of age (between 6 and 8 months), and a second dose from 9 months of age.

Contra-indications, adverse effects, precautions

– Do not administer to patients under immunosuppressive therapy or with history of an allergic reaction to a previous injection of measles vaccine or true allergy to egg.
– Vaccination should be postponed in the event of severe acute febrile illness (minor infections are not contra-indications).
– May cause:
  • within 15 days after injection: fever, skin rash, rhinopharyngitis;
  • exceptionally: seizures, encephalitis.
– Do not mix with other vaccines in the same syringe (inactivation of vaccines).
– If administered simultaneously with EPI vaccines, use different syringes and injection sites.
– *Pregnancy and breast-feeding: this vaccination is not indicated in adults.*

Remarks

– Immunity develops 7 to 10 days after injection, and lasts for at least 10 years (when administered at 9 months).
– *Storage:* 
  • *Powder: between 2°C and 8°C.*
  • *Diluent: a cold chain is not required for storage. However, at least 12 hours before reconstitution of the vaccine, the diluent must be refrigerated between 2°C and 8°C so that the diluent and lyophilised powder are at the same temperature: a temperature difference during reconstitution may reduce vaccine efficacy. Do not freeze.*
  • *Reconstituted vaccine: between 2°C and 8°C for 6 hours maximum.*

MENINGOCOCCAL VACCINE A + C
(AC Vax®, Mencevax® AC, Mengivac® AC…)

Indications

– Prevention of meningitis due to meningococci groups A and C:
  • in mass immunisation campaigns in the event of an outbreak due to meningococcus A or C
  • in travellers spending more than 1 month in hyperendemic areas

Composition, presentation and route of administration

– Inactivated bacterial vaccine, polysaccharide
– Powder for injection in monodose or multidose vial, to be dissolved with the entire vial of the diluent supplied by the manufacturer, for deep SC or IM injection, into the deltoid muscle or the anterolateral part of the thigh in children (follow manufacturer's instructions)

Dosage and vaccination schedule

– Child from 2 years and adult: 0.5 ml as a single dose

Contra-indications, adverse effects, precautions

– Do not administer to patients with history of an allergic reaction to a previous injection of meningococcal vaccine.
– Vaccination should be postponed in the event of severe acute febrile illness (minor infections are not contra-indications).
– May cause: mild local reaction, mild fever.
– Do not mix with other vaccines in the same syringe (inactivation of vaccines).
– If administered simultaneously with EPI vaccines, use different syringes and injection sites.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Immunity develops 7 to 10 days after injection, and lasts for approximately 3 years.
– *Storage:*
  • *Powder: between 2°C and 8°C.*
  • *Diluent: a cold chain is not required for storage. However, at least 12 hours before reconstitution of the vaccine, the diluent must be refrigerated between 2°C and 8°C so that the diluent and lyophilised powder are at the same temperature: a temperature difference during reconstitution may reduce vaccine efficacy. Do not freeze.*
  • *Reconstituted vaccine: between 2°C and 8°C, for 6 hours maximum.*

MENINGOCOCCAL VACCINE A + C + W135 (Mencevax® ACW)

Indications

- Prevention of meningitis due to meningococci groups A, C and W135:
  - in mass immunisation campaigns in the event of an outbreak due to meningococcus A, C or W135
  - in travellers spending more than 1 month in hyperendemic areas

Composition, presentation and route of administration

- Inactivated bacterial vaccine, polysaccharide
- Powder for injection in multidose vial, to be dissolved with the entire vial of the diluent supplied by the manufacturer, for SC injection only

Dosage and vaccination schedule

- Child from 2 years and adult: 0.5 ml as a single dose

Contra-indications, adverse effects, precautions

- Do not administer to patients with history of an allergic reaction to a previous injection of meningococcal vaccine.
- Vaccination should be postponed in the event of severe acute febrile illness (minor infections are not contra-indications).
- May cause: mild local reaction, mild fever.
- Do not mix with other vaccines in the same syringe (inactivation of vaccines).
- If administered simultaneously with EPI vaccines, use different syringes and injection sites.
- *Pregnancy: no contra-indication*
- *Breast-feeding: no contra-indication*

Remarks

- Immunity develops 7 to 10 days after injection, and lasts for approximately 3 years.
- *Storage:* 
  - *Powder: between 2°C and 8°C.*
  - *Diluent: a cold chain is not required for storage. However, at least 12 hours before reconstitution of the vaccine, the diluent must be refrigerated between 2°C and 8°C so that the diluent and lyophilised powder are at the same temperature: a temperature difference during reconstitution may reduce vaccine efficacy. Do not freeze.*
  - *Reconstituted vaccine: between 2°C and 8°C, for 6 hours maximum.*

ORAL ANTIPOLIOMYELITIS VACCINE (OPV)

Indications

– Prevention of poliomyelitis

Composition, presentation and route of administration

– Live-attenuated virus vaccine, trivalent (poliovirus types 1, 2 and 3)
– Oral suspension in multidose vial, to be administered on the tongue, with dropper

Dosage and vaccination schedule

– One dose = 2 to 3 drops depending on manufacturer
  • *in non endemic areas*, administer 3 doses 4 weeks apart: at 6, 10 and 14 weeks of age
  • *in endemic areas*, administer 4 doses 4 weeks apart: at birth then at 6, 10 and 14 weeks of age

Protection lasts at least 5 years after 3 doses.

Contra-indications, adverse effects, precautions

– No contra-indication. Vaccination should be postponed in the event of severe acute febrile illness. Minor infections are not contra-indications.
– If a child has diarrhoea when the vaccine is administered, give the usual dose then give an extra dose 4 weeks later.
– May cause (exceptionally): paralytic poliomyelitis, encephalopathy.
– Respect an interval of 4 weeks between each dose.
– *Pregnancy*: **CONTRA-INDICATED** *during the first trimester, except if there is a high risk of contamination*
– *Breast-feeding: no contra-indication*

Remarks

– *Storage: between 2°C and 8°C* – 
For prolonged storage: freeze (–20°C).
OPV is very sensitive to heat. The vaccine vials therefore have a heat-sensitive monitor (VVM). The square on the monitor changes colour when exposed to heat over a period of time: if the square is lighter than the circle, the vaccine can be used. If the square is the same colour or darker than the circle, or if the solution is cloudy, the vial must be destroyed.

Human RABIES IMMUNOGLOBULIN (HRIG) (Imogam Rabies®…)

Therapeutic action

– Neutralisation of rabies virus. HRIG provides passive immunization against rabies for 3 to 4 weeks.

Indications

– Prevention of rabies after category III exposure (except in patients correctly vaccinated against rabies before exposure), in combination with rabies vaccine
– Prevention of rabies after category II and III exposures in immunodeficient patients (even in patients correctly vaccinated against rabies before exposure), in combination with rabies vaccine

Presentation and route of administration

– Solution for injection in 300 IU (150 IU/ml, 2 ml) or 1500 IU (150 IU/ml, 10 ml) vials, for infiltration into the wound and IM injection

Dosage and duration

– Child and adult: 20 IU/kg as a single dose on D0, along with the first dose of rabies vaccine.
– Infiltrate as much of the dose as possible in and around the wound(s), which has been cleaned beforehand. Inject any residual product, using the IM route, in a different site from that used for vaccination. In the event of multiple wounds, dilute the dose 2 to 3-fold with sterile 0.9% NaCl to obtain a sufficient quantity to infiltrate all the sites exposed.
– If HRIG is not available on D0, the first dose of rabies vaccine is administered alone. HRIG can still be given as soon as possible within the next few days. However, HRIG is no longer recommended when 7 or more days have elapsed since the first dose of vaccine was given, as vaccine-induced immunity will have developed by this time.

Contra-indications, adverse effects, precautions

– No contra-indication (including during pregnancy and breast-feeding).
– May cause: fever, myalgia, headache, gastrointestinal disturbances; rarely: allergic and anaphylactic reactions.
– Ensure that the HRIG does not enter a blood vessel (risk of shock): aspirate prior to injection to confirm that the needle is not in a vein.
– For finger wounds, infiltrate with caution to avoid causing a compartment syndrome.
– Do not administer HRIG and rabies vaccine in the same syringe and in the same injection site.

Remarks

– Immunocompetent patients are considered as correctly vaccinated against rabies if they present a document confirming pre-exposure vaccination with 3 doses of cell culture rabies vaccine.
– Highly purified equine immune globulin derivative F(ab')2 may replace HRIG if unavailable. The method of administration is the same but the dose is 40 IU/kg.
– *Storage*: *between 2°C and 8°C. Do not freeze.* 

RABIES VACCINE
(Verorab®, Rabipur®, Imovax Rabies®…)

Indications

– Prevention of rabies after category II and III exposures

Composition, presentation and route of administration

– Inactivated virus vaccine, prepared from cell culture (CCV): purified Vero-cell vaccine (VPCV) or purified chick embryo-cell vaccine (PCECV) or human diploid-cell vaccine (HDCV)
– Powder for injection in monodose vial, to be dissolved with the entire vial of the diluent (0.5 ml or 1 ml) supplied by the manufacturer
– HDCV (Imovax Rabies®) is administered by IM route only, into the anterolateral part of the thigh in children < 2 years and into the deltoid in children > 2 years and adults.
– VPCV (Verorab®) and PCECV (Rabipur®) may be administered by IM route as above or by ID route into the arm.

Dosage and vaccination schedule

– The 1st dose of vaccine should be administered as soon as possible after exposure, even if the patient seeks medical attention long after exposure (rabies incubation period may last several months). The patient must receive all the recommended doses.
– Vaccination schedules may vary from country to country, check national recommendations. The schedule will depend on the patient's vaccination status prior to exposure and the route of administration used (follow manufacturer's instructions).
– Child and adult: one IM dose = 0.5 or 1 ml, depending on the vaccine used; one ID dose = 0.1 ml

The simplest vaccination schedules endorsed by the WHO are the following:

Vaccination status at the time of exposure	***No* rabies vaccination** or ***Incomplete* vaccination** or ***Complete* vaccination *with a NTV*** or ***Unknown* vaccination status**		***Complete* vaccination *with a CCV***
Administration route and schedule	**IM**	**ID**	**IM** or **ID**
D0	2 doses* (1 dose in each arm or thigh)	2 doses* (1 dose in each arm)	1 dose
D3		2 doses (1 dose in each arm)	1 dose
D7	1 dose	2 doses (1 dose in each arm)	
D21	1 dose		
D28		2 doses (1 dose in each arm)	

* And, depending on the category of exposure, rabies immunoglobulin as a single dose.

Contra-indications, adverse effects, precautions

- No contra-indication for post-exposure vaccination (including during pregnancy and breast-feeding).
- May cause:
  - benign local reactions at the injection site (pain, induration),
  - general reactions (fever, malaise, headache, gastrointestinal disturbances, etc.),
  - exceptionally: anaphylactic reaction.
- For patients receiving chloroquine for prophylaxis or treatment of malaria, use IM route only.
- Do not administer corticoids concomitantly (vaccine efficacy diminished).
- IM vaccination: do not administer into the gluteal region (risk of treatment failure); ensure that the vaccine does not enter a blood vessel (risk of shock): aspirate prior to injection to confirm that the needle is not in a vein.
- ID vaccination: incorrect ID technique results in treatment failure. If correct ID technique cannot be assured, use the IM regimen.
- Do not mix with other vaccines in the same syringe.
- If administered simultaneously with rabies immunoglobulin or other vaccines, use different syringes and injection sites.

Remarks

- Only patients that present a document confirming complete pre-exposure vaccination with 3 doses of a VCC are considered as correctly vaccinated.
- The use of vaccines prepared from animal nerve tissue (NTVs) is not recommended.
- Rabies vaccine is also used for *pre-exposure* vaccination in persons at high risk of infection (prolonged stay in rabies endemic areas, professionals in contact with animals susceptible of carrying the virus). The vaccination schedule includes 3 doses given at D0, D7 and D21 or D28. Booster doses are recommended for persons exposed to permanent or frequent contact with the virus.
- *Storage:* 
  - *Powder: between 2°C and 8°C. Do not freeze.*
  - *Diluent: a cold chain is not required for storage. However, at least 12 hours before reconstitution of the vaccine, the diluent must be refrigerated between 2°C and 8°C so that the diluent and lyophilised powder are at the same temperature: a temperature difference during reconstitution may reduce vaccine efficacy. Do not freeze.*
  - *Reconstituted vaccine: use immediately.*

TETANUS VACCINE (TT)

Indications

- Prevention of tetanus in wound management
- Prevention of maternal and neonatal tetanus in women of childbearing age and pregnant women

Composition, presentation and route of administration

- Purified tetanus toxoid
- Suspension for injection in multidose vial or single-dose syringe, for IM or SC injection into the anterolateral part of the thigh or the deltoid muscle

Dosage and vaccination schedule

- 0.5 ml per injection
- *Prevention of tetanus in wound management*

Wound risk category	**Complete vaccination** (3 doses or more) Time elapsed since last dose:			**Incomplete vaccination** (less than 3 doses) or **no vaccination** or **unknown vaccination status**
	< 5 years	5-10 years	> 10 years	
Clean, minor wounds	No booster required	No booster required	TT one booster dose	Start* or complete tetanus vaccination
All other wounds	No booster required	TT one booster dose	TT one booster dose	Start* or complete tetanus vaccination and administer tetanus immunoglobulin

* At least 2 doses administered 4 weeks apart, then 3 additional doses administered according to the same protocol as that used for women of childbearing age, to ensure longer lasting immunity.

- *Prevention of maternal and neonatal tetanus in women of childbearing age and pregnant women*

  5 doses administered according to the following protocol:

TT1	On first contact with medical service or as early in pregnancy as possible
TT2	At least 4 weeks after TT1
TT3	6 to 12 months after TT2 or during subsequent pregnancy
TT4	1 to 5 years after TT3 or during subsequent pregnancy
TT5	1 to 10 years after TT4 or during subsequent pregnancy

Pregnant women should receive at least 2 doses of tetanus vaccine administered at least 4 weeks apart, with the last dose at least 2 weeks before delivery. After delivery, continue vaccination as described in the table above until the required five doses have been administered.

Contra-indications, adverse effects, precautions

- Do not administer in the event of significant reactions to a previous dose of tetanus vaccine.
- Vaccination should be postponed in the event of severe acute febrile illness (minor infections are not contra-indications).
- May cause: minor local reactions (redness, pain at the injection site); exceptionally, anaphylactic reactions.
- *Pregnancy: no contra-indication*
- *Breast-feeding: no contra-indication*

Remarks

- For the prevention of tetanus in wound management, preferred vaccines are:
  - diphtheria-tetanus-pertussis (DTP) or diphtheria-tetanus (DT) in children < 7 years,
  - tetanus-diphtheria (Td) in children ≥ 7 years, adolescents and adults.
- For the prevention of maternal and neonatal tetanus in women of childbearing age and pregnant women, administer either TT vaccine or tetanus-diphtheria vaccine (Td).
- *Storage: between 2°C and 8°C. Do not freeze.* 

Human TETANUS IMMUNOGLOBULIN (HTIG)

Therapeutic action

– Neutralisation of tetanus toxin. HTIG provides passive immunization against tetanus for 3 to 4 weeks.

Indications

– Prevention of tetanus in wound management, in patients non immunised or incompletely immunised or in patients whose immunisation status is unknown, in combination with tetanus vaccine
– Treatment of clinical tetanus

Presentation and route of administration

– Solution for injection, in 250 IU (250 IU/ml, 1 ml) or 500 IU (250 IU/ml, 2 ml) ampoule or single-dose syringe, for IM injection. DO NOT ADMINISTER BY IV ROUTE.

Dosage and duration

– *Prevention of tetanus*
  HTIG is administered in the event of tetanus-prone wounds, e.g. wounds with fracture, deep penetrating wounds, bite wounds, wounds containing foreign bodies, wounds contaminated with soil, infected wounds, extensive tissue damage (contusions, burns).
  Child and adult: 250 IU as a single dose; 500 IU if more than 24 hours has elapsed
  HTIG should be administered as soon as possible after injury, along with the tetanus vaccine, in a separate syringe and injection site.
– *Treatment of tetanus*
  Neonate, child and adult: 500 IU as a single dose, to be injected into 2 different sites

Contra-indications, adverse effects, precautions

– Do not administer to patients with known allergy to HTIG.
– May cause (very rarely): allergic reactions.
– Ensure that the HTIG does not enter a blood vessel (risk of shock): aspirate prior to injection to confirm that the needle is not in a vein.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– For minor clean wounds, tetanus vaccine is administered alone.
– SC route may be used but only if IM route is contra-indicated.
– *Storage: between 2°C and 8°C. Do not freeze.* 

TETANUS ANTITOXIN (EQUINE)

Equine tetanus antitoxin should no longer be used, as there is a risk of hypersensitivity and serum sickness.
It should be replaced by human tetanus immunoglobulin.

Therapeutic action

– Neutralisation of tetanus toxin. Tetanus antiserum provides temporary passive immunity against tetanus for 15 days.

Indications

– Prevention of tetanus in wound management, in patients non immunised or incompletely immunised or in patients whose immunisation status is unknown, in combination with tetanus vaccine
– Treatment of clinical tetanus

Composition, presentation and route of administration

– Solution prepared from the serum of horses immunised against tetanus toxin
– 1500 IU in 1 ml ampoule, for IM injection. DO NOT ADMINISTER BY IV ROUTE.

Dosage and duration

– *Prevention of tetanus*
  Tetanus antiserum is administered in the event of tetanus-prone wounds, e.g. wounds with fracture, deep penetrating wounds, bite wounds, wounds containing foreign bodies, wounds contaminated with soil, infected wounds, extensive tissue damage (contusions, burns).
  Child and adult: 1500 IU as a single dose; 3000 IU if more than 24 hours has elapsed
  It is administered as soon as possible after injury, along with the tetanus vaccine, in a separate syringe and injection site.
– *Treatment of tetanus*
  Neonate: 1500 IU as a single dose
  Child and adult: 10 000 IU as a single dose

Contra-indications, adverse effects, precautions

– Do not administer to patients with known allergy to tetanus antiserum.
– May cause: hypersensitivity reactions, anaphylactic shock, Quinke oedema; serum sickness up to 10 days after injection.
– Administer following Besredka's method: inject 0.1 ml by SC route and wait 15 minutes; if no local or general allergic reactions occur, inject 0.25 ml by SC route and wait 15 minutes; if no reactions, administer the injection by IM route.
– Ensure that the injection does not enter a blood vessel (risk of shock): aspirate prior to injection to confirm that the needle is not in a vein.
– *Pregnancy and breast-feeding: no contra-indication*

Remarks

– Equine tetanus antitoxin is not included in the WHO list of essential medicines.
– *Storage: between 2°C and 8°C. Do not freeze.*

YELLOW FEVER VACCINE

Indications

- Prevention of yellow fever:
  - in children from 9 months of age and adults living in or travelling through endemic areas
  - in mass immunisation campaigns in the event of an outbreak

Composition, presentation and route of administration

- Live-attenuated virus vaccine
- Powder for injection in multidose vial, to be dissolved with the entire vial of diluent supplied by the manufacturer, for IM injection into the anterolateral part of the thigh in children under 2 years and SC injection into the deltoid muscle in children over 2 years and adults

Dosage and vaccination schedule

- Child and adult: 0.5 ml as a single dose
- In routine immunisation (EPI), the vaccine is usually administered from 9 months of age, along with the measles vaccine.
- Vaccination is contra-indicated in children less than 6 months. In children between 6 and 9 months, vaccination is only recommended in epidemics, as the risk of virus transmission may be very high.

Contra¬indications, adverse effects, precautions

- Do not administer to patients with history of an allergic reaction to a previous injection of yellow fever vaccine, true allergy to egg, immunodeficiency (e.g. symptomatic HIV infection, immunosuppressive therapy).
- Vaccination should be postponed in the event of severe acute febrile illness (minor infections are not contra-indications).
- May cause:
  - minor reactions: mild fever, headache, myalgia;
  - severe reactions (exceptionally): hypersensitivity reactions, encephalitis (especially in children < 9 months and adults > 60 years), multiple organ failure (especially in adults > 60 years).
- Do not mix with other vaccines in the same syringe (inactivation of vaccines).
- If administered simultaneously with EPI vaccines, use different syringes and injection sites.
- *Pregnancy: not recommended. However, given the severity of yellow fever, the vaccine is administered when the risk of contamination is very high (epidemics, unavoidable travel to regions of high endemicity).*
- *Breast-feeding: no contra-indication*

Remarks

- Immunity develops approximately 10 days after injection, and lasts for at least 10 years.
- *Storage:* 
  - *Powder: between 2°C and 8°C.*
  - *Diluent: a cold chain is not required for storage. However, at least 12 hours before reconstitution of the vaccine, the diluent must be refrigerated between 2°C and 8°C so that the diluent and lyophilised powder are at the same temperature: a temperature difference during reconstitution may reduce vaccine efficacy. Do not freeze.*
  - *Reconstituted vaccine: between 2°C and 8°C, for 6 hours maximum.*

Drugs for external use, antiseptics and disinfectants

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ACICLOVIR eye ointment (Zovirax®…)

Prescription under medical supervision

Therapeutic action

– Antiviral active against herpes virus

Indications

– Treatment of herpes keratitis
– Prevention of herpes keratitis in neonate born to a mother suffering from genital herpes at the moment of childbirth

Presentation

– 3% ointment, tube

Dosage and duration

– *Treatment of herpes keratitis*
  Child and adult: 5 applications/day into the conjunctival sac of both eyes for 14 days or for 3 days after lesions have healed
– *Prevention of herpes keratitis in neonate*
  Immediately after birth: wash the eyes with sterile sodium chloride 0,9% then apply a single dose of aciclovir into the conjunctival sac of both eyes

Contra-indications, adverse effects, precautions

– In neonates, wait 12 hours after application of aciclovir 3% then apply tetracycline eye ointment 1% to prevent gonococcal neonatal conjunctivitis.

Remarks

– *Conservation: below 30°C*
  Use within 30 days after first opening.
  To avoid contamination, close the tube properly after opening.

ALCOHOL-BASED solution or gel (Clinogel®, Manugel®, Manurub®, Sterillium®...)

Therapeutic action

– Antiseptic

Indications

– Antiseptic hand rub, before and after procedures, whether gloves are used or not

Presentation

– Ready to use alcohol-based hand rub solution or gel

Use

– Alcohol-based hand rubs can only be used if hands are not visibly dirty or soiled with organic matter. There must be no residual powder on hands (use powder-free gloves) and hands must be dry.

– Apply 3 ml of solution or gel in a cupped hand and spread to cover the entire surface of hands. Rub hands for 20-30 seconds, palm to palm, palm over dorsum, between fingers (fingers interlaced), around the thumbs and nails, until hands are completely dry. Do not dilute the product. Do not rinse off or dry hands.

– As long as hands are not visibly soiled, the product may be reapplied as many times as necessary without handwashing before or after applying the product.

Contra-indications, adverse effects, precautions

– Do not use if:
  • hands are visibly dirty or soiled with organic matter (wash hands),
  • there is residual powder on hands (wash hands),
  • hands are wet (water dilutes alcohol and impedes drying).
– Do not use after direct contact with a patient with a parasitic skin infection (scabies, lice): wash hands.
– Do not use simultaneously with soap or another antiseptic (antagonism, inactivation, etc.).
– Do not use for disinfection of surfaces, material, patient's skin or mucous membranes.
– May cause: stinging sensation on broken skin.
– In case of eye contact flush immediately with plenty of water.

Remarks

– Dose required and duration of handrubbing may vary depending on the product used. Read the manufacturer's instructions carefully to check the dose and duration required.
– To avoid difficulty in putting on gloves, rub hands until the product is completely dry.
– Use of alcohol-based hand rubs may result in a sticky residue on hands after several applications. In this event, wash hands.
– Some alcohol-based hand rubs can be used for surgical hand antisepsis, however the technique is not the same as for antiseptic hand rub.
– *Storage: below 30°C –* 
Close bottles tightly to avoid evaporation. Keep away from sources of ignition (flame, spark, incandescent material).

ARTESUNATE (rectal)
(Plasmotrim®…)

Prescription under medical supervision

Therapeutic action
– Antimalarial

Indications
– Initial (pre-referral) treatment of severe falciparum malaria, before transferring the patient to a facility where parenteral antimalarial treatment can be administered
– Initial treatment of uncomplicated falciparum malaria, when persistent vomiting precludes oral therapy

Presentation
– 50 mg and 200 mg rectal capsules

Dosage and duration
– *Severe falciparum malaria*
Child and adult: 10 to 20 mg/kg as a single dose before transferring the patient
– *Uncomplicated falciparum malaria*
Child and adult: 10 to 20 mg/kg once daily. As soon as patient can take oral treatment, administer a 3-day course of an artemisinin-based combination.

Weight	50 mg rectal capsule	200 mg rectal capsule
3 to 5 kg	1	–
6 to 10 kg	2	–
11 to 20 kg	–	1
21 to 40 kg	–	2
41 to 60 kg	–	3
61 to 80 kg	–	4

Contra-indications, adverse effects, precautions
– May cause: gastrointestinal disturbances, headache and dizziness.
– *Pregnancy: avoid during the first trimester*
– *Breast-feeding: no contra-indication*

Remarks
– Buttocks should be held together for at least 1 minute to ensure retention. If capsules are expelled from the rectum within 30 min of insertion, re-administer the treatment.
– Up to 2 or 3 capsules can be administered simultaneously. When the dose to be administered is 4 capsules, insert 3 capsules then wait 10 minutes before administering the fourth.
– The treatment of choice of severe falciparum malaria is based on IV artesunate or IM artemether or IV quinine. When it is *absolutely* impossible to transfer a patient to a facility where parenteral antimalarial treatment can be administered, artesunate rectal capsules should be administered once daily until the patient is able to take a 3-day course of an artemisinin-based combination.
– *Storage: below 25-30°C* – 

BENZOIC ACID + SALICYLIC ACID ointment
= Whitfield's ointment

Therapeutic action
– Antifungal and keratolytic agent

Indications
– Dermatophytoses of the scalp (ringworms), in combination with griseofulvin
– Dermatophytoses of the skin, in combination with griseofulvin in the event of extensive lesions

Presentation
– Benzoic acid 6% + salicylic acid 3% ointment, tube or jar

Dosage
– 2 applications/day

Duration
– 3 to 6 weeks according to clinical response

Contra-indications, adverse effects, precautions
– Do not apply to exudative lesions, mucous membranes or eyes.
– In case of secondary bacterial infection, start appropriate local (antiseptic) or systemic (antibiotic) treatment before applying Whitfield's ointment.
– May cause: skin irritation and inflammation.
– In case of contact with eyes or mucous membranes, flush immediately with plenty of water.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– *Storage: below 30°C –* 
Once the ointment has been exposed to a high temperature the active ingredients are no longer evenly distributed: the ointment must be homogenized before using.
To avoid contamination, close the tube or the jar properly after opening.

BENZYL BENZOATE

Therapeutic action
– Scabicide

Indications
– Scabies

Presentation
– 25% lotion

Preparation and use
– Shake the bottle before application or dilution.
– Dilute the lotion, as required, according to age. Use drinking or boiled water.

	Child < 2 years	**Child 2-12 years**	**Child > 12 years and adult**
Preparation	1 part of 25% lotion + 3 parts of water	1 part of 25% lotion + 1 part of water	Undiluted 25% solution
Contact time	12 hours (6 hours in children < 6 months)	24 hours	24 hours

– Apply the lotion to the whole body, including scalp, postauricular areas, palms and soles. Pay particular attention to skin creases and interdigital web spaces. Do not apply to the face and mucous membranes.
– In children under 2 years: apply only once; wrap hands to avoid accidental ingestion; rinse off when the recommended contact time has elapsed.
– In children ≥ 2 years and adults: a second application (e.g. after 24 hours, with a rinse between the two applications; or two successive applications, 10 minutes apart, when the first application has dried, with a rinse after 24 hours) reduces the risk of treatment failure.

Contra-indications, adverse effects, precautions
– Do not apply to broken or infected skin. In the event of secondary bacterial infection, administer an appropriate local (antiseptic) and/or systemic (antibiotic) treatment 24 to 48 hours before applying benzyl benzoate.
– May cause: burning sensation; contact dermatitis in case of repeated applications; seizures in the event of marked transcutaneous absorption (broken skin, children < 2 years).
– Avoid contact with eyes. In case of eye contact, flush immediately with plenty of water.
– DO NOT SWALLOW (risk of seizures). In case of ingestion: do not induce vomiting, do not perform gastric lavage; administer activated charcoal.
– *Pregnancy: no contra-indication; do not leave on skin longer than 12 hours; do not repeat application.*
– *Breast-feeding: no contra-indication; do not apply to breasts.*

Remarks
– Close contacts should be treated at the same time regardless of whether they have symptoms or not. Decontaminate clothes and bed linen of patients and close contacts simultaneously.
– Itching may persist for 1 to 3 weeks despite successful treatment. Do not re-treat during this period. The treatment may be repeated if specific scabies lesions (scabious burrows) are still present after 3 weeks.
– 5% permethrin cream or lotion is preferred when available, especially in children less than 2 years and pregnant or lactating women.
– *Storage: below 30°C* –

CALAMINE lotion

Action thérapeutique
– Antipruritic drug

Indications
– Pruritic dermatoses

Presentation
– Calamine 8% or 15% lotion, bottle

Dosage
– 2 to 4 applications/day

Duration
– According to clinical response

Contra-indications, adverse effects, precautions
– Clean the skin before applying the lotion.
– Do not apply to exudative and/or superinfected lesions, mucous membranes or eyes.
– In case of contact with eyes or mucous membranes, flush immediately with plenty of water.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication, do not apply on breasts*

Remarks
– Shake the lotion well before using.
– *Storage: below 30°C –* 
To avoid contamination, close the bottle properly after opening.

CHLORHEXIDINE
(Hibitane®…)

Therapeutic action
– Antiseptic

Indications
– Antisepsis of minor and superficial wounds and burns

Presentation
– 5% concentrated solution of chlorhexidine gluconate to be diluted before use
Check that the solution may be diluted with ordinary, non-distilled water (in this event the formulation should contain a surfactant to prevent the precipitation of chlorhexidine).

Preparation
– Use as a 0.05% aqueous solution:
For one litre: 10 ml of 5% concentrated solution + 990 ml of clear water, boiled a few minutes and cooled

Contra-indications, adverse effects, precautions
– Do not use undiluted solution.
– Do not bring into contact with body cavities, eyes (risk of corneal damage), brain and meninges, middle ear (risk of deafness if ear drum is perforated).
– Avoid applications to mucous membranes, especially to genital mucous membranes.
– Do not use with soap or other antiseptics (incompatibility).

Remarks
– Also comes in 20% chlorhexidine gluconate concentrated solutions. These solutions usually do not contain a surfactant and must be diluted with distilled water.
– *Storage*: 
  - *Concentrated solution: below 25°C*
  - *Diluted solution: maximum one week*

CHLORINE-RELEASING COMPOUNDS (NaDCC, HTH, choramine-T, liquid bleach, chlorinated lime, TCCA)

Therapeutic action

– Disinfectants

Indications

– Disinfection of objects, instruments, linen, floors and surfaces

Presentation

– The potency of chlorine disinfectants is generally expressed in terms of available (or "active") chlorine in either:
  • percentage (%)
  • g/litre or mg/litre
  • parts per million (ppm)
  • chlorometric degree (1°chl. = approximately 0.3% available chorine)

1% = 10 g/litre = 10 000 ppm
1 mg/litre = 1 ppm = 0.0001%

– The most widely used chlorine disinfectants are:
  • Sodium dichloroisocyanurate (NaDCC).....1 g available chlorine/tablet
  • Calcium hypochlorite (HTH), granules .....65-70% available chlorine
  • Chloramine-T, powder or tablet .....25% available chlorine
  • Sodium hypochlorite solutions (liquid bleach):
    - concentrated bleach (extrait de javel).....6° or 48°chl. = 10 or 15% available chlorine
    - bleach (eau de Javel) .....5% available chlorine
    - bleach (eau de Javel).....12°chl. = 3.6% available chlorine
    - bleach (eau de Javel).....9°chl. = 2.6% available chlorine
  • Chlorinated lime, powder .....25-35% available chlorine
  • Trichloro-isocyanuric acid (TCCA), granules or powder.....available chlorine

Preparation and use

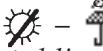
– The concentration required depends on the infectious risk and on the amount of organic material present (how clean/unclean the surface is).
– Prepare solutions just before use, with clear water, in non-metallic containers (metal inactivates chlorine).
– The available chlorine content must always be checked on the product packaging in order to adjust the dilution if necessary.
– A deposit in HTH solutions and chlorinated lime solutions is normal (use only the supernatant).
– Disinfection of linen: only suitable for white cotton and linen (risk of discolouration). Soak for 15 minutes maximum. Do not exceed 0.1% (1000 ppm) of available chlorine. Rinse abundantly (at least 3 times) with clear water.
– Disinfection of instruments: use only for stainless steel instruments. Do not exceed 0.1% (1000 ppm) of available chlorine. Soak for 30 minutes maximum. Use cold water only. Rinse abundantly and dry.

Equipment and surfaces				
	Clean	**"Unclean"** *not contaminated with blood*	**"Unclean"** *contaminated with blood*	**Heavily soiled** *large blood spills, sputum*
Examples	clean medical items, clean linen	surfaces and equipment in cholera outbreaks	floors, laboratory equipment	any heavily soiled item
Concentration required expressed in available chlorine	**0.1% = 1000 ppm**	**0.2% = 2000 ppm**	**0.5% = 5000 ppm**	**1% = 10 000 ppm**
NaDCC (1 g available chlorine/tablet)	1 tab/litre water	2 tab/litre water	5 tab/litre water	10 tab/litre water
Calcium hypochlorite (70% available chlorine)	1.5 g/litre = ± 1 level tablespoon for 10 litres water	3 g/litre = ± 2 level tablespoons for 10 litres water	7 g/litre = ± 5 level tablespoons for 10 litres water	15 g/litre = ± 1 level tablespoon for 1 litre water
Bleach (5% available chlorine)	20 ml + 980 ml water	40 ml + 960 ml water	100 ml + 900 ml water	200 ml + 800 ml water

Precautions

- Handle concentrated products with caution (avoid jolts and exposure to high temperatures or flames).
- Avoid inhaling vapours and dust when opening or handling the containers.
- Do not mix with detergents.
- Do not bring dry products, particularly HTH and chlorinated lime, in contact with organic materials (e.g. corpses): risk of explosion.

Remarks

- Sodium dichloroisocyanurate (NaDCC) is more stable and less corrosive than the other products.
- Trichloro-isocyanuric acid (TCCA) is very similar to NaDCC, but its use is limited due to its poor solubility.
- Calcium hypochlorite, bleach and concentrated bleach may be used to prepare antiseptic solutions (as substitute to Dakin's solution) provided sodium bicarbonate (one teaspoon per litre) is added to the final solution to neutralise the alkalinity.
  - for wounds: solution of 0.1% (1000 ppm) available chlorine,
  - for mucous membranes: solution of 0.05% (500 ppm) available chlorine.
- Sodium tosylchloramide (chloramine T) is used above all as an antiseptic for wounds and mucous membranes.
- *Storage: in airtight, non-metallic containers, protected from light, heat (and humidity for dry products).*  –
  Chlorinated lime, bleach and concentrated bleach are unstable (maximum a few months for bleach and concentrated bleach). HTH is more stable. NaDCC is by far the most stable.

CLOTRIMAZOLE
(Canestene®, Mycoril®…)

Prescription under medical supervision

Therapeutic action
– Antifungal

Indications
– Vaginal candidiasis

Presentation
– 200 mg and 500 mg vaginal tablets with applicator
Also comes in 1% and 10% vaginal cream.

Dosage and duration
– Adult:
  • one vaginal tablet of 500 mg as a single dose, inserted high into the vagina, at bedtime
  or
  • one vaginal tablet of 200 mg/day for 3 days, inserted high into the vagina, at bedtime

Contra-indications, adverse effects, precautions
– Do not administer to patients with:
  • hypersensitivity to other azole antifungals (fluconazole, itraconazole, ketoconazole, etc.),
  • vulvar or vaginal sores or ulcers.
– May cause: local irritation (due to infection, a true allergy is exceptional).
– Do not combine with nystatin vaginal tablets (antagonism).
– *Pregnancy: no contra-indication (but do not use the applicator to avoid mechanical trauma)*
– *Breast-feeding: no contra-indication*

Remarks
– Also comes in 100 mg vaginal tablet (one vaginal tablet/day for 6 days).
– Do not interrupt treatment during menstruation.
– *Storage: below 30°C* –

DINOPROSTONE

Prescription under medical supervision

Therapeutic action

– Cervical ripening agent, oxytocic drug (prostaglandin)

Indications

– Induction of labour when continuation of pregnancy is dangerous for mother and/or foetus and the cervix is not favourable (e.g. severe pre-eclampsia)

Presentation

– 3 g of vaginal gel containing 1 mg of dinoprostone, in prefilled syringe, to be administered intra-vaginally into the posterior fornix of the vaginal canal

Dosage and duration

– One dose of 1 mg. Administer a second dose of 1 mg, 6 hours later, if there has been no change in the cervix or no onset of uterine contractions.

Contra-indications, adverse effects, precautions

– Do not administer in the event of malpresentation, true cephalopelvic disproportion, complete placenta praevia, history of caesarean section.
– Administer with caution in the event of grand multiparity (risk of uterine rupture).
– Do not administer simultaneously with oxytocin. At least 6 hours must have elapsed since the last administration of dinoprostone before oxytocin can be given.
– May cause: gastrointestinal disorders, uterine hypertonia, uterine rupture, modification of the foetal heart rate, foetal distress.
– Regular monitoring of the intensity and frequency of contractions is mandatory.
– Continuous foetal heart monitoring is mandatory for 30 minutes after administration of each dose of dinoprostone and once contractions are experienced or detected.

Remarks

– Oral misoprostol is another prostaglandin used in the induction of labour. It is less expensive and easier to store than dinoprostone.
– Misoprostol is preferred in the event of intrauterine foetal death. On the other hand, the dose of misoprostol used for induction of labour with a viable foetus is difficult to manage using the 200 µg tablet of misoprostol. Dinoprostone is easier to use in these situations.
– When the cervix is favourable, induce labour through administration of oxytocin and artificial rupture of the membranes.
– *Storage: between 2°C and 8°C* – 

ETHYL ALCOHOL = ETHANOL

Therapeutic action

– Antiseptic and disinfectant

Indications

– Antisepsis of intact skin prior to injections and venopunctures
– Disinfection of latex stopper of infusion bottles and drug vials (except vaccines), latex injection sites of infusion sets

Presentation

– Mixtures of alcohol (ethanol) and water in different concentrations (e.g. 95% v/v ethanol), sometimes containing additives to avoid their ingestion.
– Alcoholic strength is expressed:
  • preferably as a percentage by *volume* of alcohol (% v/v); e.g. 1000 ml of 95% v/v alcohol contains 950 ml of absolute alcohol.
  • sometimes as a percentage by *weight* of alcohol (% w/w). The % w/w is not equal to the % v/v because the mixture of water and alcohol produces a reduction in volume.
  • sometimes in *degrees* (°) but this should be discouraged as it is a source of error. There are at least 3 different definitions of degrees: the old UK definition (° British proof), the American (° proof) and the one used in French speaking countries (1° = 1% v/v). For example: 40% v/v = 70° proof (British system) = 80° proof (American system) = 40° in French speaking countries.

Preparation

– Use 70% v/v ethanol, which is more effective than higher concentrations.
– To obtain 1 litre of 70% v/v ethanol:
  • take 785 ml of 90% v/v ethanol, or 730 ml of 95% v/v ethanol, or 707 ml of 99% v/v ethanol,
  • add distilled or filtered water to make up a volume of 1 litre,
  • leave to cool and top up with water again to bring the volume back to 1 litre (mixing water and ethanol together produces a reaction whereby volume is reduced).

Precautions

– Do not apply to mucous membranes, wounds or burns: it is painful, irritating and slows the healing process.
– Do not apply on neonatal skin.

Remarks

– Ethanol can be used for disinfection of non-critical medical items (items that are in contact with intact skin only) that are not soiled by blood or other body fluids.
– Critical medical items (surgical instruments, etc.) cannot, under any circumstances, be "sterilized" by alcohol flaming, immersion in ethanol or wiping with ethanol.
– *Storage: below 30°C* – 
Close bottles tightly to avoid evaporation. Keep away from sources of ignition (flame, spark, incandescent material).

FLUORESCEIN

Therapeutic action

– Ophthalmic diagnostic agent

Indications

– Diagnosis of corneal and conjunctival lesions
– Detection of corneal and conjunctival foreign bodies

Presentation

– 0,5%, 1% and 2% fluorescein eye drops in single use vial
– Sterile, individually wrapped paper strips impregnated with fluorescein

Use

– Eye drops: instill 1 or 2 drops into the conjunctival sac.
– Paper strips: place a strip into the conjunctival sac.
– After instillation of fluorescein, the eye should be examined under cobalt blue illumination.

Contra-indications, adverse effects, precautions

– Before use, check that the patient is not wearing soft contact lenses (fluorescein can permanently stain soft contact lenses).
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Vials and paper strips are designed for single use only; they must be discarded after use.
– *Storage: below 30°C –* 

Alcoholic solutions of IODINE (iodised alcohol, iodine tincture)

The use of alcoholic solutions of iodine is not recommended. They are very irritating, expensive and difficult to store ; the alcohol evaporates (solutions become even more irritating as they age).
Polyvidone iodine is much less irritating and easier to store.

Therapeutic action

- Antiseptic
- Antifungal

Indications

- Antisepsis of intact skin (skin cleansing prior to injections, puncture, surgery)
- Treatment of fungal infections of the skin

Presentation

- Iodised alcohol (1 or 3% iodine in 50 to 90% ethanol v/v)
- Iodine tincture (5% iodine in 80 or 90% ethanol v/v + 3% potassium iodine) is a very concentrated preparation that should no longer be used.

Contra-indications, adverse effects, precautions

- Do not apply to mucous membranes, wounds or burns: the alcohol is painful, irritating and slows the healing process.
- May cause: skin reactions, allergic reactions.
- Incompatible with mercury compounds (merbromine, etc).

Remarks

- *Storage: maximum of a few weeks*

MALATHION
(Prioderm®…)

Therapeutic action
– Pediculicide (organophosphorus insecticide)

Indications
– Head pediculosis (lice)

Presentation
– 0.5% lotion

Use
– Apply lotion to hair and scalp; pay particular attention to the areas behind the ears and around the nape of the neck.
– Leave on hair for:
  • 8 hours in children from 6 months to 2 years
  • 12 hours in children over 2 years and adults
– Rinse with plenty of water.
– It is recommended to repeat the application after 10 days.

Contra-indications, adverse effects, precautions
– Use with caution and under medical supervision in children under 2 years.
– May cause: scalp irritation.
– Avoid contact with eyes. In the event of product entering the eye, rinse with plenty of water.
– NEVER SWALLOW. The first signs of poisoning after accidental ingestion are gastrointestinal disturbances (vomiting, diarrhoea). Dyspnoea, seizures or coma are signs of severe intoxication. As soon as the first signs appear, administer injectable atropine as an antidote.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Examine everyone in contact with a patient and treat only those infected. Preventive treatment of non-infected persons is ineffective and increases the risk of resistance.
– Malathion is flammable. Keep medication away from heat sources.
– Malathion is not included in the WHO list of essential medicines.
– *Storage: below 30°C* –

MERBROMIN = SODIUM MERCURESCEIN (Mercurochrome®…)

The use of this drug is not recommended:
- **it is toxic and allergenic,**
- **it is a weak antiseptic,**
- **it is inactivated by organic matter,**
- **it is expensive.**

Therapeutic action
- Antiseptic

Indications
- Antisepsis of minor and superficial wounds

Presentation
- Powder to be dissolved
- 1 or 2% aqueous solutions ready for use
- 2% alcoholic solution ready for use

Contra-indications, adverse effects, precautions
- Do not use with iodine compounds (iodised alcohol, polyvidone iodine): risk of necrosis.
- May cause:
  - renal, neurologic and gastrointestinal toxicity due to the resorption of mercury through skin,
  - frequent allergic reactions, often associated with a hypersensitivity to all mercurial compounds (other mercurial antiseptics, dental amalgams, preservatives used in cosmetics).
- Colours the skin: may mask an inflammatory reaction.

Remarks
- Aqueous solutions have a very weak antiseptic activity. Alcoholic solutions are more effective. However merbromin carries serious adverse effects and the use of all solutions must therefore be abandoned.
- Other mercurial compounds: phenylmercuric borate, mercurobutol (Mercryl®), thiomersal (Thimerosal®) have the same adverse effects and must also be abandoned.
- Merbromin is not included in the WHO list of essential medicines.
- *Storage*: no special temperature requirements

METHYLROSANILINIUM CHLORIDE
= GENTIAN VIOLET = GV = CRYSTAL VIOLET

Therapeutic action
- Antifungal
- Drying agent

Indications
- Treatment of candidal infections:
  - oral candidiasis
  - mammary candidiasis in nursing mothers
  - candidal diaper dermatitis
- Treatment of oozing dermatosis (dermatophytosis, impetigo, etc.)

Presentation
- Powder to be dissolved
- 0.5% solution

Preparation
- Dissolve one teaspoon of powder (= 5 g) in 1 litre of clear water (boiled a few minutes and cooled) to obtain a 0.5% aqueous solution.
- Shake well and leave to settle. Filter through cotton or pour carefully into another bottle to eliminate any possible sediment.
- Before use, carefully wash both the bottle for dilution and the storage bottle with hot water and leave to dry.

Use
- 2 applications/day until lesions disappear

Contra-indications, adverse effects, precautions
- Do not apply to wounds or ulcerations.
- Do not apply to the face or mucous membranes (except oral cavity).
- May cause:
  - irritation, ulcerations, allergic reactions,
  - persistent staining of the skin.
- The solution may be applied to the oral cavity but should not be swallowed.
- The use of cooking oil or vaseline around lips before swabbing can limit the risk of skin coloration.
- Stop treatment in the event of allergic reactions or if new ulcerations develop.
- In the event of product entering the eye, rinse with plenty of water.

Remarks
- Avoid contact with clothes (causes permanent staining of fabrics).
- <u>Storage</u>: 
  - *Powder to be dissolved: unlimited*
  - *Diluted solution: maximum 1 week*

MICONAZOLE
(Daktarin®, Micatin®…)

Prescription under medical supervision

Therapeutic action
– Antifungal

Indications
– Treatment of cutaneous candidiasis
– Treatment of dermatophytoses (ringworm, etc.)

Presentation
– 2% cream, tube

Also comes in powder, ointment, and gel for external use.

Dosage
– 2 applications/day, sparingly, on clean and dry skin

Duration
– *Cutaneous candidiasis*: 1 to 2 weeks
– *Scalp ringworm*: 4 to 8 weeks; *ringworm of the body*: 2 to 3 weeks

Contra-indications, adverse effects, precautions
– Do not use in patients with hypersensitivity to azole antifungals (fluconazole, ketoconazole, itraconazole, etc.).
– May cause: skin reactions (irritation, burning sensation). In the event, stop treatment.
– When applied to a large area of skin or when used in newborns: risk of systemic absorption.
– Avoid contact with the eyes. In case of contact with eyes, flush immediately with plenty of water.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication. Do not apply on breast, except in the event of mammary candidiasis (in this event apply cream two times a day after breast-feeding).*

Remarks
– *Storage: below 30°C –* 
To avoid contamination, close the tube properly after opening.

MICONAZOLE muco-adhesive buccal tablet (Tibozole®)

Prescription under medical supervision

Therapeutic action

– Antifungal

Indications

– Oro-pharyngeal candidiasis in immunodeficient patients

Presentation

– 10 mg muco-adhesive buccal tablet

Dosage and duration

– Child and adult: one tablet once daily for 7 days

Moisten the tablet with the tongue. Place the tablet on the upper gingiva, above a lateral incisor and cover with the upper lip. Apply a slight pressure with the index finger to the outside of the upper lip for 20 seconds, directly over the tablet, until it sticks to the gingiva. The tablet remains on the gingiva and releases miconazole for 8 to 12 hours.

Contra-indications, adverse effects, precautions

– The drug is well tolerated.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks

– Do not swallow tablets: the treatment being local, swallowing is not harmful but is ineffective.
– Miconazole is not contra-indicated in young children but it is difficult to use correctly muco-adhesive buccal tablets in children under 7 years.
– Miconazole also exists as an oral gel (Daktarin®, etc.) applied on the lesions for 7 to 15 days (child: 1 measure 4 times a day; adult: 2 measures 4 times a day).
– *Storage: below 25°C* –  –
Tablets are packed in a blister containing 7 tablets. Leave tablets in blister until use. Once a tablet is removed from the blister, it must be used immediately.

NYSTATIN
(Mycostatin®…)

Therapeutic action
– Antifungal

Indications
– Vaginal candidiasis

Presentation
– 100 000 IU vaginal tablet

Dosage and duration
– Adult: 1 or 2 tablets of 100 000 IU/day at bedtime for 14 days
Tablets must be moistened and inserted high into the vagina.

Contra-indications, adverse effects, precautions
– The drug is well tolerated.
– Do not combine with clotrimazole vaginal tablets (antagonism).
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– By preference use clotrimazole vaginal tablets for this indication.
– Do not interrupt treatment during menstruation.
– *Storage: below 25°C* –  – 

PERMETHRIN 1%

Therapeutic action
– Pediculicide (pyrethroid insecticide)

Indications
– Head pediculosis (lice)

Presentation
– 1% lotion

Use
– Apply lotion to hair and scalp; pay particular attention to the areas behind the ears and around the nape of the neck.
– Leave on hair for 10 minutes.
– Rinse with plenty of water.
– It is recommended to repeat the application after 10 days.

Contra-indications, adverse effects, precautions
– Use with caution and under medical supervision in children under 6 months.
– May cause: scalp irritation.
– Avoid contact with eyes. In case of eye contact, flush immediately with plenty of water.
– NEVER SWALLOW. In case of accidental swallowing, the treatment is symptomatic.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication*

Remarks
– Examine everyone in contact with a patient and treat only those infected. Preventive treatment of non-infected persons is ineffective and increases the risk of resistance.
– For better results, use the lotion rather than the shampoo.
– Permethrin 5% cream is used for the treatment of scabies in children over 2 months and adults.
– *Storage: below 25°C* –

PERMETHRIN 5%

Therapeutic action
– Scabicide (pyrethroid insecticide)

Indications
– Scabies

Presentation
– 5% cream or lotion

Use
– Apply the cream or lotion to the whole body, including scalp, postauricular areas, palms and soles. Pay particular attention to skin creases and interdigital web spaces. Do not apply to the face and mucous membranes.
– In children under 2 years: wrap hands to avoid accidental ingestion.
– Leave on skin for 8 to 12 hours then rinse off.
– A single application may be sufficient. A second application 7 days later reduces the risk of treatment failure.

Contra-indications, adverse effects, precautions
– Do not use in children under 2 months (safety not established).
– Do not apply to broken or infected skin. In the event of secondary bacterial infection, administer an appropriate local (antiseptic) and/or systemic (antibiotic) treatment 24 to 48 hours before applying permethrin.
– May cause (rarely): skin irritation.
– Avoid contact with eyes. In case of eye contact flush immediately with plenty of water.
– NEVER SWALLOW. In case of accidental ingestion, the treatment is symptomatic.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication; do not apply to breasts.*

Remarks
– Close contacts should be treated at the same time regardless of whether there have symptoms or not. Decontaminate clothes and bed linen of patients and close contacts simultaneously.
– Itching may persist for 1 to 3 weeks despite successful treatment. Do not re-treat during this period. The treatment may be repeated if specific scabies lesions (scabious burrows) are still present after 3 weeks.
– 5% permethrin used for the treatment of scabies is not to be confused with 1% permethrin used for the treatment of head and pubic lice.
– *Storage: below 25°C –* 

PODOPHYLLOTOXIN
(Condyline®, Condylox®, Wartec®…)

Prescription under medical supervision

Therapeutic action
– Antiviral, antimitotic, cytolytic agent active against human papillomaviruses (HPVs)

Indications
– Treatment of external genital warts, perianal warts and vaginal warts

Presentation
– 0.5% solution or gel, with applicator tips

Dosage
– Apply podophyllotoxin to warts twice daily.
– For vaginal warts, allow to dry before removing the speculum.

Duration
– 3 consecutive days per week, for a maximum of 4 weeks

Contra-indications, adverse effects, precautions
– Do not use to treat genital warts in children.
– Do not apply to warts > 3 cm.
– Do not apply to cervical, urethral, anorectal or oral warts.
– Do not apply to healthy skin.
– May cause local reactions: erythema, ulceration, pain in area where applied.
– Use a new applicator tip for each application.
– Avoid contact with eyes. In case of eye contact flush immediately with plenty of water.
– *Pregnancy*: ***CONTRA-INDICATED***
– *Breast-feeding*: ***CONTRA-INDICATED***

Remarks
– When treatment is contra-indicated or has failed after 4 weeks, change treatment method (cryosurgery, electrosurgery, surgical removal).
– *Storage: below 30°C* –

PODOPHYLLUM resin

Prescription under medical supervision

Therapeutic action
– Antiviral, antimitotic, cytolytic agent active against human papillomaviruses (HPVs)

Indications
– Treatment of external genital warts, perianal warts and vaginal warts

Presentation
– Podophyllum resin in alcohol or compound benzoin, 10%, 15% and 25% solution.

Use
– Always apply a protective layer of vaseline or zinc ointment on the surrounding skin prior to treatment.
– Apply podophyllum resin to warts:
  • For external warts, leave on the warts for 1 to 4 hours then wash with soap and water.
  • For vaginal warts, allow to dry before removing the speculum.

Duration
– Apply once weekly if necessary, for a maximum of 4 weeks.

Contra-indications, adverse effects, precautions
– Do not use to treat genital warts in children.
– Do not apply to healthy skin or mucous membranes, or to warts > 3 cm, or to cervical, urethral, anorectal or oral warts.
– May cause:
  • local reactions: erythema, ulceration, pain in area where applied,
  • systemic adverse effects: gastrointestinal disturbances, haematological and neurological disorders (possibly severe) in the event of prolonged or excessive application, or when applied to bleeding lesions.
– Avoid contact with eyes. In case of eye contact flush immediately with plenty of water.
– *Pregnancy*: **CONTRA-INDICATED**
– *Breast-feeding*: **CONTRA-INDICATED**

Remarks
– Use by preference 0.5% podophyllotoxin solution: it is as effective as podophyllum resin, but less irritant and toxic. Another advantage is that the patient may apply the solution to the warts himself; whereas the resin must always be applied by medical staff.
– When treatment is contra-indicated or has failed after 4 weeks, change treatment method (cryosurgery, electrosurgery, surgical removal).
– *Storage: below 30°C* – 

POLYVIDONE IODINE = POVIDONE IODINE = PVI
aqueous solution (Betadine dermal solution®…)

Therapeutic action
– Antiseptic and disinfectant

Indications
– Antisepsis of intact or broken skin and mucous membranes
– Local treatment of bacterial, viral or fungal infections of the oral cavity
– Disinfection of latex stopper of infusion bottles and drug vials (except vaccines), latex injection sites of infusion sets

Presentation
– 10% aqueous solution

Use
– *Antisepsis of intact skin (injections, punctures)*
Apply 10% solution to the puncture/injection site and allow to dry before inserting the needle. The skin should be cleaned beforehand if soiled or if the procedure is invasive (lumbar puncture, epidural/spinal anaesthesia, etc.).
– *Preoperative skin antisepsis*
Apply 10% solution twice. Allow to dry between each application (do not dab to accelerate drying). Incise once the 2nd application has dried. The surgical site should be cleaned beforehand with PVI scrub solution.
– *Wound antisepsis*
Apply 10% solution to small superficial wounds.
For large wounds and burns, wound irrigation, etc., dilute PVI (1/4 of 10% PVI and 3/4 of 0.9% NaCl or sterile water) then rinse with 0.9% NaCl or sterile water.
– *Mouth washes (in adults)*
Dilute 1 or 2 teaspoons of 10% solution in 200 ml of water. Rinse around the mouth, do not swallow, spit out, repeat. Use twice daily.

Contra-indications, adverse effects, precautions
– Do not use with other antiseptics such as chlorhexidine-cetrimide (incompatibility) or mercury compounds (risk of necrosis).
– Do not use in preterm neonates and neonates < 1.5 kg.
– Due to the risk of transcutaneous resorption of iodine, do not use repeatedly nor on large areas, especially in pregnant and lactating women and infants < 1 month.
– May cause: local skin reactions; exceptionally, allergic reactions.

Remarks
– The antiseptic effect of PVI begins after 30 seconds of contact. However, a minimum contact time of 1 minute is recommended to eliminate bacteria.
– *Storage: below 30°C –*
Once the bottle has been opened, solution keeps 30 days.

POLYVIDONE IODINE = POVIDONE IODINE = PVI
scrub solution (Videne scrub®, Betadine scrub®…)

Therapeutic action
– Antiseptic

Indications
– Antiseptic hand wash and surgical hand antisepsis
– Preoperative skin preparation (patient preoperative showering, antiseptic cleansing of the surgical site)
– Cleansing of contaminated wounds

Presentation
– 7.5% scrub solution. Also comes in 4% scrub solution.

Use
– *Antiseptic hand wash*
Wet hands; pour 5 ml of solution; rub hands for 1 min; rinse thoroughly; dry with a clean towel.
– *Surgical hand antisepsis*
There are different protocols, for information:
Wet hands and forearms; spread 5 ml of solution on hands and forearms and rub for 1 or 2 min (i.e. 30 seconds or 1 min for each side); brush the nails of each hand for 30 seconds; rinse.
Spread again 5 ml of solution on hands and forearms and rub for 2 min; rinse thoroughly; dry with a sterile towel.
– *Patient preoperative showering*
Wet the whole body including hair; apply the solution and rub until the foam is white, start at the head and move down, finishing with the feet. Pay special attention to hair, armpit, hands, perineum, genitals and toes. Leave in contact a few minutes and rinse. Dry with a clean towel; put on clean clothes.
– *Antiseptic cleansing of surgical site*
Rub for 1 min the surgical site, using sterile gauze soaked with sterile water and solution; rinse with sterile water; dry with sterile gauze.
– *Cleansing of contaminated wounds*
Prepare a diluted solution:
With 7.5% solution: 1 part of solution + 5 parts of sterile 0.9% NaCl or water
With 4% solution: 1 part of solution + 2 parts of sterile 0.9% NaCl or water
Clean the wound; rinse thoroughly.

Contra-indications, adverse effects, precautions
– Do not use with others antiseptics such as chlorhexidine-cetrimide (incompatibility) or mercury compounds (risk of necrosis). Given the possible interactions between different groups of antiseptics, PVI scrub solution must only be used with products of the same group (i.e. PVI aqueous or alcoholic solutions).
– Do not use in preterm neonates and neonates < 1.5 kg (use ordinary soap).
– May cause: local skin reactions (contact dermatitis); exceptionally: allergic reactions.
– *Pregnancy and breast-feeding: no contra-indication for brief application; no prolonged use.*

Remarks
– For preoperative skin preparation, cleansing of the surgical site is followed by the application of 10% PVI solution.
– *Storage: below 25°C* – 

POTASSIUM PERMANGANATE

The use of this drug is not recommended because of frequent mistakes in dilution when using crystals or solutions, and the risk of ingestion when using tablets.

Therapeutic action

– Weak antiseptic

Indications

– Cleansing of wounds, ulcers, abscesses
– Treatment of oozing eczema

Presentation

– 0.25 g, 0.40 g and 0.50 g tablets to be dissolved before use
– Crystals to be dissolved before use
– 0.1% concentrated aqueous solution to be diluted before use

Preparation and use

– Prepare a 0.01% solution with clear water, boiled a few minutes and cooled. The concentration must be precise:
  • if it is too low: ineffective
  • if it is too high: caustic

  Tablets: one 0.25 g tablet in 2.5 litres of water or one 0.40 g tablet in 4 litres of water or one 0.50 g tablet in 5 litres of water

  0.1% concentrated aqueous solution: dilution 1:10

  Crystals: 100 mg in 1 litre of water. Use scales to weigh the crystals in order to obtain the correct concentration.

– Use as wet dressings and baths.

Contra-indications, adverse effects, precautions

– Do not insert into vagina (risk of haemorrhage, perforation, peritonitis).
– May cause: irritation and dryness of skin in the event of repeated applications.
– Do not store permanganate tablets near oral tablets.
– NEVER SWALLOW. Ingestion may cause: nausea, vomiting, gastrointestinal damages (oedema, burns, haemorrhage); cardiovascular depression, etc.
– Handle crystals, tablets and concentrated solutions with caution: risk of burns (wear gloves); risk of explosion when brought into contact with readily oxidisable substances.
– In the event of product entering the eye, rinse with plenty of water for 15 minutes.

Remarks

– *Storage*:
  • *Dry product: in a cool place, in airtight containers* –  – 
  • *0.01% solution diluted for use: do not store, prepare just before use.*

SILVER SULFADIAZINE
(Dermazin®, Flamazine®, Sicazine®…)

Therapeutic action
– Antibacterial (group of sulfonamides)

Indications
– Prophylaxis and treatment of infections of second- and third-degree burns
– Treatment of infections of chronic wounds: leg ulcers, bed sores, etc.

Presentation
– 1% sterile cream, tube or jar

Use
– Clean the wound with sterile water or sodium chloride 0.9%.
– Apply a 2 to 3 mm layer of silver sulfadiazine cream to the wound once daily and cover with sterile compresses.
– If the wound is left uncovered, re-apply silver sulfadiazine if necessary (the wound should always remain covered by cream).

Duration
– Until satisfactory healing has occurred.
– For burns that require skin grafting: until skin graft is performed.

Contra-indications, adverse effects, precautions
– Do not use in patients with hypersensitivity to sulfonamides.
– Do not apply this cream to newborn infants.
– Do not apply other topical treatments to wounds where silver sulfadiazine is applied.
– May cause:
  • skin reactions,
  • when applied to a large burned area: systemic absorption with risk of adverse effects related to sulfonamides (haematologic disorders, gastrointestinal disturbances, etc.).
– *Pregnancy*: **CONTRA-INDICATED** *during the last month of pregnancy*
– *Breast-feeding*: **CONTRA-INDICATED**

Remarks
– *Storage: between 8°C and 25°C –* 
Close the tube or the jar properly after opening to avoid contamination and exposure to light.

SODIUM DICHLOROISOCYANURATE = NADCC

Therapeutic action

– Antiseptic and disinfectant (chlorine-releasing compound)

Indications

– Antisepsis of wounds (only if the formulation can be used for this purpose)
– Pre-disinfection of soiled instruments
– Disinfection of instruments, linen, laboratory equipment, surfaces, floors, etc.

Presentation

– 1.67 g NaDCC effervescent tablet, releasing 1 g available chlorine when dissolved in water. Also comes in different strengths and in granules and powder.
– Some formulations used for disinfecting floors contain additives (detergents, colouring, etc.) and can not be used on wounds. Check label or leaflet.

Preparation and use

– *Antisepsis of wounds*
  0.1% available chlorine solution (1000 ppm): 1 tablet of 1 g available chlorine per litre
  Use in wet dressing, irrigation or bath. For prolonged use, protect the healthy skin around the wound with vaseline.

– *Pre-disinfection of soiled instruments*
  0.1% available chlorine solution (1000 ppm): 1 tablet of 1 g available chlorine per litre
  Immediately after use, soak instruments for 15 minutes, then clean instruments.

– *"High level" disinfection of clean instruments*
  0.1% available chlorine solution (1000 ppm): 1 tablet of 1 g available chlorine per litre
  Soak previously cleaned instruments for 20 minutes, rinse thoroughly and dry.

– *Disinfection of linen*
  0.1% available chlorine solution (1000 ppm): 1 tablet of 1 g available chlorine per litre
  Soak for 15 minutes, rinse thoroughly (at least 3 times).

– *General disinfection (surfaces, floors, sinks, equipment, etc.)*
  - Clean conditions:
    0.1% available chlorine solution (1000 ppm): 1 tablet of 1 g available chlorine per litre
  - « Unclean » conditions without blood contamination:
    0.2% available chlorine solution (2000 ppm): 2 tablets of 1 g available chlorine per litre
  - « Unclean » conditions with blood spills:
    0.5% available chlorine solution (5000 ppm): 5 tablets of 1 g available chlorine per litre
  - Large blood spills, sputum:
    1% available chlorine solution (10 000 ppm): 10 tablets of 1 g available chlorine per litre
    Pour 1% solution over area, leave in contact for 10 minutes, wipe off with absorbent material (to be discarded as contaminated waste), rinse and clean.

Precautions

- Prepare solutions with clean water, in non metallic containers.
- NaDCC can corrode metal. The risk is limited for good quality stainless steel instruments if concentration, contact time (30 minutes maximum) and thorough rinsing recommendations are respected.
- For disinfection of linen: use only for white cotton or linen (risk of discolouration).
- Do not expose the product to flames. Do not incinerate.
- DO NOT SWALLOW. Do not store NaDCC tablets near oral tablets.
- Avoid inhaling vapours and dust when opening or handling the containers.
- Do not mix with:
  - some detergents: release of toxic chlorine gas. Only anionic detergents (soft soap) can be safely mixed with NaDCC solutions.
  - acid solutions (urine, etc.): release of toxic chlorine gas.

Remarks

- Some formulations can be used for the disinfection of drinking water (Aquatabs®, etc.). Follow manufacturer's instructions.
- NaDCC is also called sodium troclosene, sodium dichloro-s-triazinetrione.
- *Storage: in airtight container, protected from light, heat and humidity, in a well ventilated room.*  – 
  - *Solutions ready for use: maximum 1 week in dark or opaque bottle (do not use a metal container) or 3 days in a transparent bottle.*
  - *Solutions used for soaking instruments must be renewed every day.*

TETRACYCLINE dermal ointment

The use of antibacterial ointments is not recommended: local applications of antibacterials that are also used orally increase the risk of selecting resistant strains of bacteria.

Therapeutic action

– Antibacterial

Indications

– No indications.
– Regular washing with antiseptic is often enough to treat a skin infection. If this fails, use oral antibiotics rather than local antibiotics.

Presentation

– 3% tetracycline ointment, tube or jar

Contra-indications, adverse effects, precautions

– May cause: eczema, photosensitivity.
– In the event of eye infection, do not apply dermal ointment to the eyes. Use only tetracycline eye ointment.

Remarks

– *Storage: below 30°C –*
Do not use after expiry date.
To avoid contamination, close the tube or the jar properly after opening.

TETRACYCLINE eye ointment

Therapeutic action
– Antibacterial

Indications
– Conjunctivitis
– Trachoma (by preference use oral azithromycin for this indication)
– Prevention of chlamydial and gonococcal neonatal conjunctivitis

Presentation
– 1% ointment, tube

Dosage and duration
– Wash the eyes with boiled and cooled water before each application. Use sterile sodium chloride 0.9% for newborns.
– Apply tetracycline 1% into the conjunctival sac of both eyes:
  • *Conjunctivitis*: 2 applications/day for 7 days
  • *Trachoma*: 2 applications/day for 6 weeks
  • *Prevention of neonatal conjunctivitis*: one single application immediately after birth

Contra-indications, adverse effects, precautions
– Do not use in patients with hypersensitivity to tetracyclines.
– May cause allergic reactions; stop treatment in the event of serious reaction.

Remarks
– Tetracycline eye ointment replaces silver nitrate 1% eye drops for the prevention of neonatal conjunctivitis.
– For the treatment of trachoma, azithromycin as single dose is as effective as a 6-week course of tetracycline ointment.
– Gonococcal neonatal conjunctivitis must be treated systemically with ceftriaxone IM (125 mg as a single dose). When systemic treatment cannot be given immediately, apply tetracycline eye ointment to both eyes every hour until ceftriaxone is available.
– Oxytetracycline (Terramycin®) and chlortetracycline (Aureomycin®) are used in the same way as tetracycline.
– In the event of eye infection, use only eye ointment; dermal ointment must never be applied to the eyes.
– *Storage: below 30°C* –
Do not use after expiry date.
To avoid contamination, close the tube properly after opening.

ZINC OXIDE ointment

Therapeutic action
– Skin protector

Indications
– Dermatosis of kwashiorkor
– Nappy rash
– Eczema
– First-degree burns
– Protection of healthy skin when caustic products such as podophyllum resin or podophyllotoxin are to be applied

Presentation
– 10% zinc oxide ointment, tube or jar

Dosage
– 1 to 3 applications/day

Duration
– According to clinical response

Contra-indications, adverse effects, precautions
– Clean the skin before applying the ointment.
– Do not apply to exudative and/or superinfected lesions.
– *Pregnancy: no contra-indication*
– *Breast-feeding: no contra-indication, do not apply on breasts*

Remarks
– *Storage: below 30°C –* 
Once the ointment has been exposed to a high temperature the active ingredients are no longer evenly distributed: the ointment must be homogenized before using.
To avoid contamination, close the tube or the jar properly after opening.

Part two

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Organisation and management of a pharmacy

Preliminary stage

Layout of a pharmacy

Pharmacy management

Organisation and rigorous management of a pharmacy are vital in all health structures, particularly when resources are limited. These activities are often entrusted to doctors and nurses with little preparation and no experience in this area. The principles concisely set out in this guide concern organisation and management of pharmacies in health centres or dispensaries; they are directed towards the following objectives :

– to maintain a permanent stock of drugs and essential consumable products of quality;
– to reduce costs;
– to save time and optimise the work of the staff;
– to facilitate management verification and continuous evaluation of consumable products.

In emergency programmes or precarious situations, the first objective is to respond to needs by ensuring that health structures are supplied. Pharmacy management (supply, storage, distribution) should be both simple enough and precise enough in order to :

– rapidly set up a system;
– integrate non-specialised, even non-qualified staff;
– replace the person in charge of the pharmacy at any moment;
– facilitate subsequent evolution towards a more complex management system.

In any case, national pharmaceutic policies and current regulations must be considered when implementing pharmaceutic activities.

To organise regional or national programmes, refer to specialised publications (see bibliography), especially *"Managing drug supply"* (WHO).

Preliminary stage

Choice of drugs

Drawing up a list of basic drugs following defined standardised therapeutic protocols offers two major advantages :

– better treatments due to more rational and safer use of a restricted number of essential drugs;
– economic and administrative improvements concerning purchasing, storage, distribution and control.

If a recently adapted national list of essential drugs exists, it should be respected. Otherwise the list proposed by the WHO (updated) is adapted to suit needs and priorities of each programme, based on recommended selection criteria.

The use of such a list, which has already proven its worth in practice, presents several advantages:

– it facilitates co-ordination of international aid and obtains approval from organisations which subsidise projects (United Nations, European Economic Community, etc.);
– it simplifies supply and reduces costs: most drugs on the WHO list are available in generic forms, at prices far more affordable than corresponding patent drugs.

It is recommended to conform to certain treatments. E.g., doses of certain common drugs: in French-speaking Africa, 500 mg aspirin tablets are used; in English-speaking Africa, 300 mg aspirin tablets are currently used.

Proposing the same drug in several dosages should be avoided for it risks leading to confusion in prescriptions and complicates management. If possible, restrict selection to one form for adults and one paediatric form.

Choice may also be orientated by availability on local markets if drugs conform to quality standards and are at competitive prices.

Consumable medical items (dressing material, injections, sutures, etc.) should be limited to essentials and the object of a standardised list.

Drug designation

All active substances have an international non-proprietary name (INN) published by the WHO: drugs should designated by their INN in all standardised lists. These designations should be used in therapeutic protocols and management documents so that all persons use the same language thus avoiding confusion. Common drugs are sold under a wide variety of brand names, depending on the manufacturer and

distributor. A single laboratory product may have different names in a single country. E.g., ampicillin may be sold as Britapen®, Penbritin®, Pentrexyl®, Totapen®…

Generic drugs are copies of drugs whose patents have expired. They can therefore be made by any pharmaceutical laboratory and are most often sold under their INN or occasionally under a new brand name.

Drug classification

Drugs can be classified in several ways.

– ***Pharmaco-therapeutic classification***

In the WHO list, drugs are classified according to their therapeutic action. In certain cases, a drug may appear in several classes, sometimes in a different form (e.g., diazepam).
This classification presents a certain pedagogical advantage: it facilitates the integration (e.g., into drug stocks) of supplies from diverse sources, as well as finding a substitute for a missing product.

– ***Alphabetical classification according to the route of administration***

Drugs are divided into five classes and listed in alphabetical order within each class:
- oral drugs,
- injectable drugs,
- infusion fluids and electrolytes,
- vaccines, immunoglobulins and antisera,
- drugs for external use, antiseptics and disinfectants.

This classification has been retained by Médecins Sans Frontières as it satisfies criteria of simplicity and standardisation, needed for complete management systems. Non-specialised personnel can work with it.
If needed, a system of codes may be added in countries not using the Latin alphabet.

Whatever classification system is adopted, it should be used at every level of a management system (ordering, storage, distribution, dispensing) in order to facilitate all procedures.

Levels of use

More limited lists should be established according to capacities of health structures and competencies of prescribers.

Restricted lists and the designation of prescription and distribution levels should be adapted to the terminology and context of each country.

Quantitative evaluation of needs

To define or re–organise a supply system, it is necessary to determine the quantities of drugs and consumable materials needed. Once lists and therapeutic protocols have been established, it is possible to calculate the respective quantities of each drug from the expected number of patients and from a breakdown of diseases.

Several methods have been suggested: see *"Estimating drug requirements"* (WHO). Figures obtained may differ from those corresponding to true needs or demands: this is the case when improvement of a health centre increases its use, or when prescribers do not respect proposed lists and therapeutic protocols. It is also possible to refer to the consumption of well-managed health structures that are comparable in terms of population and pathology.

When a system is well organised, management aids easily furnish quantitative data.

In a disaster situation (e.g. displaced population), the *Interagency Emergency Health Kit 2006*, developed in collaboration with WHO, UNHCR, MSF, etc., provides a rapid response to medical needs, both qualitative and quantitative. Each kit is intended to supply drugs and material needed to manage health needs of a population of 10,000 people for 3 months. Afterwards, specific local needs should be quickly evaluated in order to establish a suitable supply.

Systematic evaluation of needs also allows verification of how well prescription schemes are respected and prevents possible stock ruptures.

Layout of a pharmacy

Premises

Functional premises should be designed in order to assure:
– the safe keeping of stocks,
– correct storage of drugs and material,
– rational and easy management.

Whether constructing a building, converting an existing building, regional warehouse or a dispensary pharmacy, the objectives are the same only the means differ. Proposals in this chapter apply to district pharmacies, responsible for supplying district health clinics, dispensaries and health posts that refer to it.

In this case, two separate areas, which may or may not be adjacent, are needed : one for daily dispensing to persons using the centre, the other a warehouse where drugs and medical material intended for all district health facilities may be stored, managed and distributed.

Characteristics of a warehouse

Dimensions of warehouse are determined by storage needs, which depend on:
- the number of drugs and kinds of material to be stocked,
- the number and activities of facilities to supply,
- distribution and receiving frequency: the lesser the frequency the greater the volume needed, thus the greater the space needed.

It is better to have too much space than not enough: a cramped warehouse is difficult to work in and keep clean, and any increases in stock or activity are also difficult. For 1 m^2 of storage space count 3 m^2 of floor space.

Security of goods demands strong and solid doors, locks, windows and even ceilings.

Correct preservation of drugs depends on temperatures and humidity, conditions that are very often difficult to control in tropical countries.
- Correct ventilation is necessary, with fans if possible, or even air-conditioning which reduces heat and humidity but is very costly.
- Windows should be shaded to avoid exposure to direct sunlight.
- Insulating construction materials may be used.
- Construction should be in concrete or stone with cement floors, slightly inclined to facilitate water drainage and maintenance.

In cold countries, it should be remembered that freezing causes ampoules and bottles to shatter, and alters certain drugs.

Interior layout of a warehouse

The layout should be logical and correspond to the circuit "reception, storage, distribution".

Shelves

Solid and stable shelves are vital. In tropical countries where termites attack wood, metal structures are preferable ; if they can be dismantled, it is easy to adjust spaces between shelves and alleys to better accommodate goods to be stored.

The arrangement of shelves, tables or other furniture, varies according to the layout of the premises.

Space between shelves and walls improves ventilation. No products or packaging, even large-sized, should be stored on the floor, but on pallets which permit air circulation and protect against flooding.

Within a warehouse, or close by, stocking areas should be provided for:

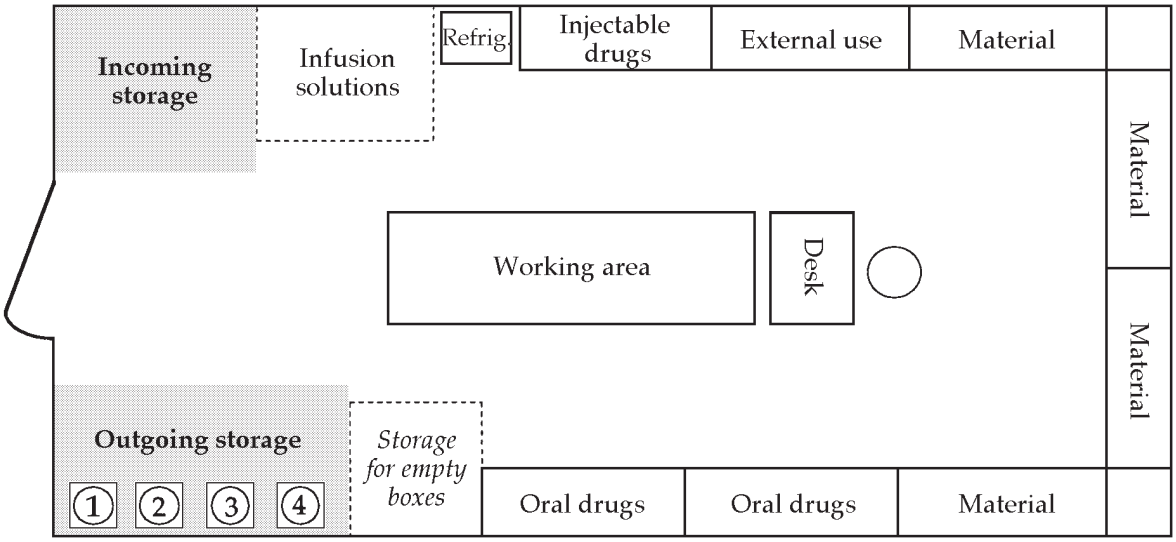
– *Receiving area*
  For stocking parcels before unpacking and checking freight and quality control.

– *Distribution area*
  For stocking peripheral orders before distribution. Each destination should have a designated area where parcels may be stocked before distribution.

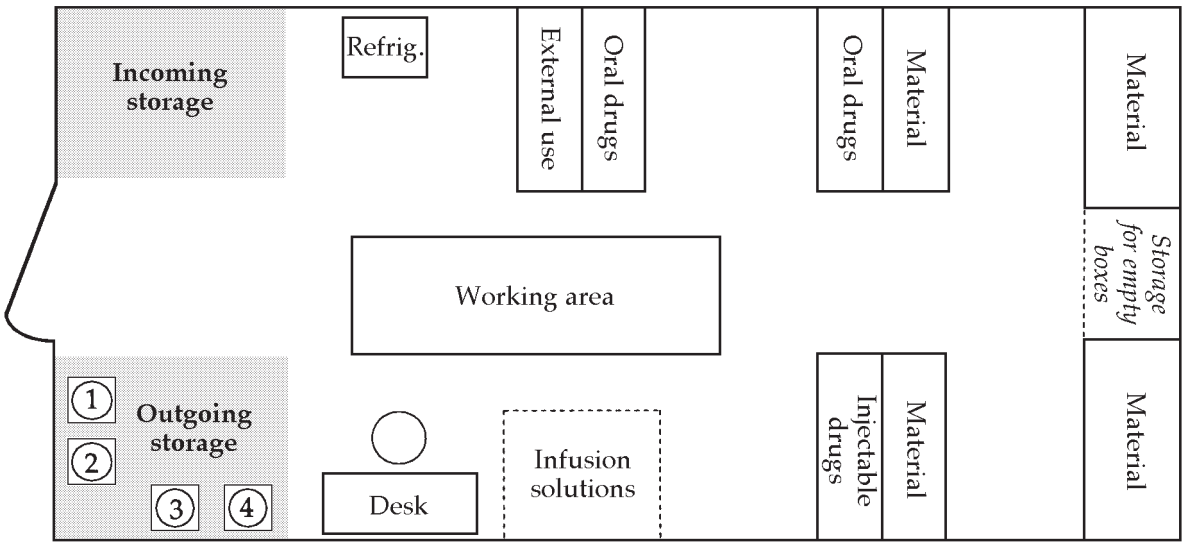
Receiving and distribution areas should be near access doors in order to facilitate handling.

Examples of peripheral pharmacy layouts (health clinic). For larger stocks or central pharmacies, use several rooms and apply the same principles by adapting layouts to needs: administration, cold room, refrigerators…

Schema 1



Schema 2



It is also recommended to plan a storage area for empty boxes, used to prepare orders for peripheral pharmacies.

A work space should be set up in order to verify deliveries (included physical examination: change of colour for tablets; particles, turbidity, precipitation for solutions) and prepare orders.

For the person in charge of the pharmacy, a desk near a light source should be set up to facilitate administrative work and for arranging documents.

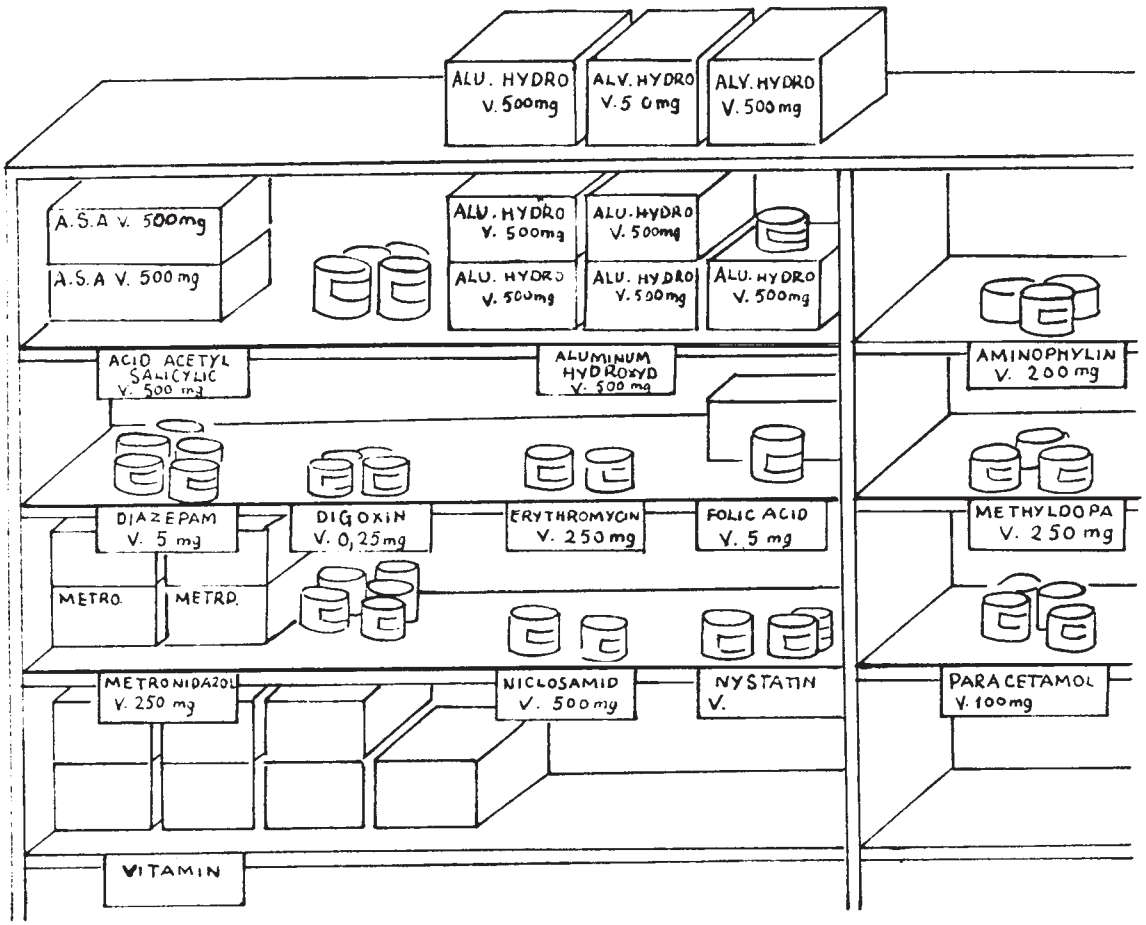
Arrangement of drugs and material

Stocks are arranged according to the classification adopted :
– oral drugs,
– injectable drugs; IV infusions are stocked separately due to their bulk,
– drugs for external use and disinfectants,
– small consumable medical material classified in sub-categories: dressings, injections, sutures, reagents and laboratory material...

In each category of products (oral, injectable, external use) are classified alphabetically.

Each product should have a designated place, well identified by a fixed label indicating the INN, form and dosage. E.g.:

AMOXICILLIN
250 mg tablet



– *Labelling*
  Every box and bottle is clearly labelled and in the official local language.
  Each label should clearly indicate:
  • the INN,
  • form and dosage,
  • the number of units (tablets, ampoules, etc.) or volume (syrups, etc.) in each box or bottle,
  • name and address of manufacturer,
  • batch number,
  • expiry date.

Narcotics and other controlled substances should be placed under lock and key

Products needing a cold chain should be stored in a refrigerator (between 2–8°C): vaccines, serums, ergometrine, insulin, oxytocin, and certain laboratory tests.

Clearly indicate expiry dates on boxes (chalk, large marker). Arrange products with the earliest expiry date at the front of the shelves and those with the latest at the back (LILO principle: last in last out). This arrangement is essential to avoid products passing their expiry date and becoming unusable.

– *Storing bulky materials*
  Put a few boxes in their normal place and, on the label, indicate where the rest of the stock is kept. Do not disperse the rest of the stock in several places.

– *Storing medical materials*
  Given the diversity of items, it is preferable not to use strict alphabetical ordering, but to group articles by category: injection material, dressing, sutures…
  Organising the pharmacy, stock cards, inventory lists and order lists in the same manner greatly reduces the workload.

Furthermore, so that persons not familiar with the INN system can find their way around in case of emergency or sudden replacement, a list of commercial names and the corresponding INN can be put up:

Bactrim®	see co-trimoxazole
Flagyl®	see metronidazole
Valium®	see diazepam
Clamoxyl®	see amoxicillin

– Provide for sufficient space between and for each drug.
– Arrangement should allow visual operation.
  It should be possible to note the number of each box and evaluate, in a few minutes, current stock or monthly consumption of a product.
– An empty space behind a label immediately shows a stock rupture.

This organisational system is indispensable for easy and efficient management. Only a few hours should be needed to do a complete inventory.

Management of a pharmacy

Organisation of activities

The management of a district pharmacy should be entrusted to a single person having received adequate training. He is responsible for both the pharmacy and the warehouse. He is the only person possessing keys to the pharmacy, warehouse and narcotics cupboard. He is helped by one or more assistants, depending on the anticipated workload.

Tasks and responsibilities of each assistant should be clearly defined: one of them should be able to replace the person in charge if necessary.

Timetables and work calendars (orders, distributions, stock-control activities) are planned to share the workload as equally as possible.

Stock-control

Stock cards

The stock-card is the principle instrument for stock control. For each item (drug and material), a stock-card is established and regularly updated, always by the same person. These cards allow:
– the identification of all stock movement, in or out;
– determining at any moment the theoretical level of stocks;
– the follow–up of consumption of different users;
– to correctly anticipate orders;
– the evaluation and localisation of losses (differences between theoretical stock and actual stock after inventory).

The following should be noted on stock cards:

– The INN, dosage form and strengths.

– All movements (in, out, origin, destination, loss due to expiration, damages) and dates.

– Current orders and dates.

– Inventories and dates. If cards are well maintained and there are no thefts, the stock column corresponds to a permanent inventory.

– The following may also be included:
  • stock levels: buffer stock, running stock, minimum stock,
  • other stock areas for a product,
  • unit price.

– Quantities are always recorded in units (5000 tablets, 80 ampoules, etc.) and never in boxes (10 boxes of amoxicillin tablets may correspond to 200 tablets [10 boxes of 20 tablets] or 10 000 tablets [10 boxes of 1000 tablets]).

– Write a single operation per line, even if several operations take place the same day.

When an order is made, the date, supplier, and quantity ordered are recorded in the origin/destination column. The stock column is not changed. When the order arrives, the quantity received is recorded in the "IN" column, and the "STOCK" column is then calculated.

Example of a stock card

Amoxicillin – 250 mg tablet (Clamoxyl®)

N° Rack _____ Mini 100 000 Maxi _____

EXACOMPTA Ref. S 3

DATES	ORIGIN / DESTINATION	IN	OUT	STOCK	ORDERED
12.12.05	M.S.F.				130 000
04.01.06	M.S.F.	130 000		130 000	
05.01.06	Béboro		30 000	100 000	
05.01.06	Koumra		5 000	95 000	
06.01.06	Moissala		25 000	70 000	
30.01.06	Inventory			70 000	
01.02.06	UNICEF				150 000
01.02.06	Béboro		20 000	50 000	
05.02.06	Goundi		40 000	10 000	
04.03.06	UNICEF	150 000		160 000	

Calculation of stock quantities to retain and order (stock level)

– ***Average monthly consumption***
Calculated from outgoing stock recorded on stock cards : add the quantities of several months in the out column (3, 6 or 12) and divide the total by the number of months.

– ***Running stock = consumption between two supply deliveries***
Running stock corresponds to the quantity of each drug consumed between two supply deliveries. E.g., if deliveries are quarterly, running stock = monthly consumption x 3.

– ***Buffer stock*** (or reserve stock)
This stock is planned to compensate for possible late deliveries, losses, and increases in consumption. It depends on the delivery delay of orders.
Expressed in months of consumption, buffer stock quantities are generally evaluated as half of the consumption during the period between two deliveries. It depends on risks that a programme may run : stock ruptures, drug expiration, specific situations (resources, seasonal supply problems…).
E.g., if the delivery delay is two months, the buffer stock corresponds to one month of average monthly consumption.

– ***Orders***
Quantities to order are based on data from stock cards:
• inventory stock levels on the day of the order,
• running stock,
• buffer stock,
• delay period between the order and delivery,
• orders not yet delivered.
Order = (running stock + buffer stock + probable consumption during delivery delay) – (inventory + orders not yet delivered)

Order forms

Pre-printed order forms for peripheral structures facilitate the preparation of orders and inventories, and avoid transcription errors.

Order forms are established according to stock classification; drugs are designated using INN and the form (tablet, capsule, ampoule, etc.), dosage, quantity ordered, etc. The following may also be included:

– *Stock levels*: it is best to do an inventory before each order.

– *Monthly consumption*.

Orders should be in triplicate, dated and countersigned by persons in charge of health structures. Two copies are sent to the supplier : one serves as a way bill and may also be used for invoicing, the second stays with the supplier. The third copy stays at the structure.

E.g.: health clinic order form, 6 month supply period, minimum stock of 3 months (2 month delivery delay + 1 month buffer stock)

Health structure: ***Beboro***

Head of structure: ***Jack Pinel, MD***

Date: ***26.06.06*** Signature: ***XXX***

ORAL DRUGS

NAME	PREPARATION	Stock	Monthly consump.	Qty ordered	Qty delivered
ACETAZOLAMIDE	tab 250 mg	—	—	—	
ACETYLSALICYLIC ACID	tab 300 mg	55 000	10 000	5 000	
ASCORBIC ACID	tab 250 mg	—	—	—	
ALUMINIUM HYDROXYDE	tab 500 mg	15 000	6 000	21 000	
AMOXICILLIN	tab 250 mg	16 000	4 000	8 000	
CEFIXIME	tab 200 mg	1 000	500	2 000	
CHLORAMPHENICOL	tab 250 mg	3 000	500	—	
CIPROFLOXACIN	tab 250 mg	3 000	1 500	6 000	

Receiving orders

All orders should be accompanied by a way bill or invoice and packing list.

On reception, the number of parcels should be verified immediately, followed by verification of their contents:
– Ensure that items delivered correspond to items ordered, and that the quantities conform to those on the packing list.
– Packaging, labelling and expiry dates of each drug should be verified, as well as the aspect of each product. Do not forget to verify special storage conditions (cold chain).

The supplier should be notified of all irregularities.

Then, drugs and material are integrated into stocks at their designated places.

Incoming quantities are recorded on stock cards.

Way bills, invoices and packing lists are to be classed with orders in an "orders" file and kept for three years or more according to current regulations.

Inventory

Inventories should be done at least once per year. If possible an inventory of current stock quantities and expiry dates should be done before each order.

Stock cards give a theoretical figure of stock quantities, but actual quantities of each product should be verified (physical stock). Differences may arise due to theft or errors in record-keeping. These differences should be clarified.

An inventory may only be easily done if the pharmacy is correctly arranged. It is an indispensable task.

During an inventory there should be no stock movements, i.e. incoming or outgoing stock.

Distribution

A warehouse supplies district pharmacies following a timetable agreed upon between the warehouse manager and persons in charge of district health structures.

Each pharmacy sends the warehouse two copies of an order form (described above):
– actual quantities supplied by the warehouse while completing the order are recorded in the "Qty delivered" column on both copies;
– one copy is sent with the delivery (mandatory);
– after verifying that all items have been correctly recorded on their respective stock cards, the second copy is placed in a file established for each district pharmacy; the date is recorded on the order form as proof.

Orders from and deliveries to district health centres or pharmacies proceed in the same manner.

Each pharmacy has its own file intended for internal management.

– ***Re-packaging drugs for dispensing to patients***

  Drugs are delivered in large boxes (or containers) containing, for example, 1000 tablets or 100 ampoules.

  In order to dispense drugs to patients, it is recommended to pre-pack each drug. To do this:
  • make a list of the most commonly prescribed drugs;
  • note usual treatment protocols for each drug, for adults and for children of each age group;
  • obtain small plastic bags (rather than paper);
  • prepare labels for each drug, clearly showing:
    - the name of the centre,
    - the name of the drug (INN), dosage form and strength,
    - the dosage written out in full (and in symbols for the illiterate),
    - the expiry date.
  • put the number of tablets corresponding to a single treatment and the corresponding label into the bag;

- seal the bags: bags that can be resealed by pressure exist (Minigrip ®); if not, it is possible to staple them closed or, preferably, to use a small heat-sealing machine which seals both sides.

Pre–packing has numerous advantages:
- easier and quicker distribution;
- better preservation of drugs;
- easier and more rigorous control of outgoing drugs ;
- a more acceptable presentation for the patient; at the same time, the drug is easier to identify and its administration is clearly indicated.

Drugs should be pre-packed according to precise procedures and checked to ensure hygiene norms are respected (cleanliness of hands, tables, containers before they are opened, bags, etc.) in order to avoid the risk of errors when dispensing drugs or in counting, as well as theft during work. This is allways justified for health structures performing over 20 consultations per day.

To repackage large quantities of tablets (health centres of large districts) tablet-counters exist, either for manual counting or automatic counting using a simple electrical device.

– ***Re-packaging for distribution of certain drugs in small health structures***

It is necessary to divide up containers of 1,000 tablets or 100 ampoules for little-used drugs in small health structures.

To obtain 100, 200 or 500 tablets, it is possible to weigh them instead of counting them if a sufficiently accurate scale is available.

– ***Dispensing drugs to patients***

So that patients correctly follow treatment, adequate explanations should be given:
- how to take the drug;
- for how long;
- why antibacterial treatments must be completely taken, while analgesic treatments should be stopped when pain ceases;
- possible side-effects: e.g., drowsiness caused by anti-histamines, the need to avoid alcohol with metronidazole, etc.

Persons dispensing drugs should be able to give patients the information they need.

Drug packaging should be presentable; labels sufficiently legible and complete to remind patients how to use the drug.

In busy centres it is better to have two people responsible for dispensing drugs in order to double check prescription deliveries; the first collects the drugs prescribed, the second then verifies and gives them to patients with all necessary explanations, slightly away from other users.

Interpreters are needed if several languages or dialects exist in the same region.

Donations of recuperated medicines and medical samples

It is not recommended to solicit or accept supplies coming from collections of drugs recuperated from consumers in industrialised countries, or free samples distributed by manufacturers.

They are very often specialised drugs unknown to prescribers and unsuitable for local pathologies. The multiplication of drugs thus supplied interfere with the implementation of standardised therapeutic protocols and makes any form of management impossible.

Choosing suppliers

Buy or import ? It is necessary to make a choice when the possibility of local supplies exists (manufacturers and/or wholesalers) and that individual importation procedures are also authorised. Excepting emergencies, the decision depends on two factors: quality and cost.

Quality

On the market there are poor quality drugs that have not undergone required controls: some do not contain enough active substances, or even none at all, while others are poorly made and deteriorate rapidly, and some are harmful.
To identify dubious suppliers, those in charge of supply centres can seek advice from local health authorities. In any case, the decision to use a local supplier is made by a pharmaceutical expert after having evaluated the possible supplier. A continuous quality control system should be set up once a supplier has been selected.

Cost

It is necessary to compare local prices with real costs of identical imported products, i.e. by including transportation (maritime or air) and transit costs, and sometimes various custom duties.
Local supply may have an advantage even if prices are slightly higher than imported products: it allows a reduction of stock levels because re–supply may be more frequent, therefore limiting risks of loss due to theft or drug expiration as well as stock volume.
When possible, it is recommended to buy local IV infusions if they are of good quality, as they are very cumbersome and relatively expensive to transport.
Rarely used drugs, which represent a negligible percentage of total supply costs, are not worth importing if they are available locally and of good quality.

Drug quality and storage

Quality standards

Storage conditions

Deterioration

Expiration

Drug quality influences treatment efficacy and safety. It depends on correct manufacturing and storage. High-quality drugs are available when using rational buying procedures and when suppliers are reliable. It is also essential to assure optimum transportation and storage conditions.

Quality standards

Each drug is characterised by particular norms written in pharmacopoeia or files presented by manufacturers and recognised by competent authorities in each country. These norms concern exterior aspects (colour, odour, etc.), physicochemical properties, analysis procedures, shelf-life (validity period) and storage instructions.

Analysis certificates guarantee that products from one batch (products from the same production cycle) conform with official quality standards in the country of manufacture. These certificates are furnished for each product by manufacturers.

Storage conditions

Stability of drugs depends on both environmental factors such as temperature, air, light and humidity, and on drug-related factors such as the active substance itself, the dosage form (tablet, solution, etc.) and the manufacturing process. It is therefore necessary to respect storage instructions for each information sheet in this guide or on manufacturer's notices and labels if the norms are not identical.

Temperature

Storage temperatures are defined by European pharmacopoeia as follows:

freezer	- 15	to	0°C
refrigerator	+ 2	to	+ 8°C
cool	+ 8	to	+ 15°C
ambient temperature	+ 15	to	+ 30°C

During transit and transportation temperatures may attain 50 to 60° C inside vehicles, shipping containers or on unloading docks and, in this case, shelf-life and expiry dates may no longer be guaranteed.

Freezing may be detrimental, particularly for solutions, leading to the precipitation of active substances or the shattering of ampoules.

Vaccines, immunoglobulins and antisera are products that are sensitive to heat and light. Even though new techniques produce vaccines that are less sensitive to heat (called "thermostable"), they still have to be stored in the refrigerator between 2°C and 8°C, and the cold chain must be strictly respected during transport.

Air

Air is a factor of deterioration due to its content of oxygen and humidity. All containers should remain closed. In air–tight and opaque containers (hospital type), drugs are protected against air and light. Opening containers long before the use of drugs should be avoided.

Light

Light is harmful for drugs, particularly for solutions. Injectable forms should be preserved in their packaging, protected from light. Coloured glass may give illusory protection against light.

Remark: laboratory reagents, rubber and sometimes plastic material are to be protected as drugs are.

Deterioration

It is important to be familiar with the normal aspects of each drug (colour, odour, solubility, consistency) in order to detect changes which may indicate its deterioration. It is important to know that deterioration does not always lead to a detectable external modification.

The principal consequence of deterioration is *a reduction of therapeutic activity*, which leads to more or less grave consequences for the individual and/or community.

For example, the use of expired antibacterials does not cure an infection and also favours the emergence of resistant strains.
It is not recommended to compensate for a possible reduction of activity by a random increase in the usual dose as there is a real danger of overdosage when using toxic drugs.

In time, certain drugs undergo a deterioration leading to the development of substances much more dangerous, thus *an increase in toxicity*. Tetracycline is the principal example: the pale, yellow powder becomes brownish and viscous, its use therefore being dangerous even if before the expiry date.

An increase in allergen strength has been observed in certain drugs. This is the case for penicillins and cephalosporins.

Suppositories, pessaries, creams and ointments that have been melted under heat should not be used. The active substance is no longer distributed in a homogenous manner.

Oral rehydration salts may be used as long as they keep their aspect of white powder. Humidity transforms them into a compact mass, more or less brownish and insoluble. They are therefore unfit for consumption, whatever their expiry date.

Expiration

Drugs deteriorate progressively and according to various processes, even if stored in adequate conditions. In most countries, regulations impose an obligation on manufacturers to study the stability of their products in standardised conditions and to guarantee a minimum expiration dating period (or validity period or shelf-life period). The expiry date indicated by manufacturers designates the date up to and including which the therapeutic effect remains unchanged (90% of the active substance should be present and with no substantial increase in toxicity).
The expiry date indicated on the label is based on the stability of the drug in its original and closed container. Validity period currently guaranteed is from 3 to 5 years. Less stable substances are only guaranteed for 1 or 2 years.

The expiry date should be indicated on the label with storage instructions.
When the expiry date is not indicated, the date of manufacture is generally indicated. In this case, the rule of a 3-year validity period may be applied for common antibacterials, hormones, vitamins, and in general all liquid forms, and a 5-year validity period for all other products. This is a general rule with many exceptions and is not applied for products necessitating particular storage conditions (e.g., in a refrigerator).

Expired drugs

Expiry dates are to be respected due to legal obligations and considerations of therapeutic responsibility.

In cases where the only available drugs have expired, a doctor may be led to take on the responsibility of using these drugs.

It is evident that a drug does not become unfit for consumption the day after its expiry date. If a product has been preserved in acceptable conditions (sheltered from humidity and light, packaging intact and at a medium temperature) and if modification of aspects or solubility have not been detected, it is often preferable to use the expired drug than to leave a gravely ill patient without treatment.

Expiry dates for drugs that require very precise dosage should be strictly respected due to a risk of under–dosage. This is the case for cardiotonic and anti–epilectic drugs, and for drugs that risk becoming toxic, such as cyclines.

Destruction of expired or unusable drugs and material

It is dangerous to throw out expired or unusable products or to bury them without precaution. For more information about destruction of drugs and material see *"Interagency Guidelines For Safe Disposal of Unwanted Pharmaceuticals in and after emergencies"*, WHO/99.2.

Prescription, cost, compliance

SOME SUGGESTIONS FOR

Reducing costs - Facilitating compliance - Reducing risks

Limiting the use of injectable drugs

Limiting the use of syrups and oral supensions

Studying the choice of treatment protocols

Considering non-essential drugs and placebos

It is possible to promote a more rational use of drugs, as much for safety as for cost, by a judicious choice of therapeutic regimens and the resulting lists of drugs.

Limiting the use of injectable drugs

Numerous patients demand treatment with injectable drugs, which they imagine to be more effective. Certain prescribers also believe that injections and IV infusions are more technical acts and thus increase their prestige.

Treatment by injection is always more costly than oral treatment. The price of the drug itself is higher for an equal dose of active substance. It requires costly disposable material. ***It exposes patients to complications*** due to poorly tolerated products (abscesses, necrosis due to quinine injections or IV antibacterials, etc.) or badly performed injection techniques (symptoms of overdose after a IV injection done too rapidly, sciatic neuropathy, etc.). If disposable injection material is re-used, there is a ***risk of bacterial or viral contamination*** (tetanus, hepatitis, HIV, etc.).

When both oral and injectable drugs are effective, administration by injection is only justified in case of ***emergency***, ***digestive intolerance*** or when a patient is ***unable to take anything by mouth***.

Oral drugs should replace injectable drugs as soon as possible during the course of treatment.

Limiting the use of syrups and oral suspensions

Taking liquid drugs is often easier, especially for children and more so if they are sweetened or flavoured. It is, however, recommended to avoid their use for numerous reasons:

– *Risk of incorrect usage*

  Outside of hospitals, determining the correct dosage is hazardous for people with little medical knowledge: spoons never contain standard volumes (soup spoons, dessert spoons, tea spoons). Oral suspensions should be prepared immediately before use with clean water, boiled, well measured, and well shaken before use. There is therefore a risk of overdose or giving an insufficient dosage.

  Preservation of oral suspensions is limited to a few days, and with syrups there is a risk of contamination or fermentation.

  In numerous countries syrups are thought of as "cough medicine". Confusion between cough mixtures and antibacterial oral suspensions or syrups is common.

– *Economic considerations*

  Compared to the price of tablets or capsules, the price of syrups and oral suspensions is considerably higher. Even using a powder for subsequent reconstitution, the costs may be 2 to 7 times higher than an equivalent dose due to the cost of the bottle itself and higher transportation costs due to weight and volume.

Studying the choice of treatment protocols

The choice of a treatment protocol often influences COMPLIANCE and COST. The shortest and least divided (1 to 2 doses per day) treatments are most often recommended. Single dose treatments are evidently ideal. Examples:

– Single dose treatment is often preferable (for example, treatment of hookworm by a single dose of mebendazole rather than the classic 3–day treatment).

– Intestinal amoebisis can be treated by either metronidazole or tinidazole, however the use of tinidazole is preferred since the treatment lasts 3 days instead of 5 to 10 days with metronidazole.

– “Short” course antituberculous therapy including rifampicin may seem costly. However, costs are even higher when uncontrolled long course treatments are interrupted, followed by relapses, reinfection, and resistance.

Considering non–essential drugs and placebos

In developing countries as in industrialised countries, patients with psychosomatic complaints are numerous. The problems that motivate their consultations may not necessarily be remedied with a drug prescription. Is it always possible or desirable to send these patients home without a prescription for a symptomatic drug or placebo? If so, what placebo should be prescribed?

When national drug policy is very strict and allows neither the use of placebos nor non–essential symptomatic drugs, other products are often used in an abusive manner, such as chloroquine, aspirin, diazepam, and even antibacterials. Conversely, a placebo may take the place of a genuinely effective and needed drug. This risk is real, but seems less frequent, which makes the introduction of placebos on a list of essential drugs relevant. For example, multivitamins may present a type of harmless and inexpensive placebo. Their composition generally corresponds to preventive treatment of vitamin deficiency and they have no contra–indications.

Numerous non–prescription drug products (tonics, oral liver treatments presented in ampoules) have no therapeutic value and, due to their price, cannot be used as placebos.

Use of antibacterials in precarious situations

Possible causes of antibacterial treatment failure
Choosing an antibacterial treatment
Antibacterial combinations
Principal antibacterial groups

Prescribing antibacterials in precarious situations is difficult. The diagnosis of an infection is based essentially on clinical criteria as laboratory testing (culture, isolation and identification of bacteria) is rarely available.

The choice of treatment protocol depends on the context in which the patient is examined:

– *Dispensaries*
  Many patients examined rapidly and therefore difficult to follow. Standard protocols should be drawn up for diagnosis and treatment of the most frequently encountered diseases. The number of available antibacterials should be limited.
– *Medical centres and hospitals*
  The number of available antibacterials is greater, alternatives are possible in the event of failure or intolerance to first line treatment.

Possible causes of antibacterial treatment failure

– Clinical signs that are infact due to viral or parasitic infections.
– Choice of antibacterial that penetrates poorly into infected tissues (abscess, cerebrospinal fluid).
– Insufficient dosage or treatment duration.
– Poor treatment compliance.
– Vomiting after oral ingestion.
– Drug interactions reducing absorption (e.g. simultaneous administration of antacids).
– Inactivation of an antibacterial after mixing several drugs in the same syringe or infusion.
– Use of antibacterial that has expired or that has deteriorated due to poor storage conditions (most antibacterials become only ineffective, except expired tetracyclines that become toxic to the kidneys).
– Bacterial resistance to the antibacterial.

Choosing an antibacterial treatment

The table below summarises the choice of antibacterials appropriate both for their penetration into the infected tissue and the most probable bacteria.

Drugs preceded by an asterisk (*) are **contra-indicated during pregnancy**.

Infections	First choice	Other possible first-line treatments
Upper respiratory tract infections		
Tonsillitis	benzathine benzylpenicillin	amoxicillin or erythromycin or penicillin V or azithromycin
Diphtheria	benzathine benzylpenicillin	erythromycin
Epiglottitis	ceftriaxone	ampicillin or *chloramphenicol
Sinusitis	amoxicillin	erythromycin or *cotrimoxazole
Lower respiratory tract infections	amoxicillin	ceftriaxone or ampicillin + gentamicin
Acute otitis media	amoxicillin	ceftriaxone
Intestinal infections		
Typhoid fever	*ciprofloxacin	amoxicillin or cefixime
Shigellosis	*ciprofloxacin	ceftriaxone
Urinary tract infections		
Upper	*ciprofloxacin	ceftriaxone or ampicillin + gentamicin
Lower	*ciprofloxacin	nitrofurantoin
Urethritis and cervicitis	azithromycin + cefixime or azithromycin + ceftriaxone	*doxycycline + cefixime or *doxycycline + ceftriaxone or erythromycin + cefixime or erythromycin + ceftriaxone
Genital ulcers		
Syphilis	benzathine benzylpenicillin	*doxycycline or erythromycin
Chancroid	azithromycin	ceftriaxone or erythromycin or *ciprofloxacin
Pelvic inflammatory disease		
Veneral	cefixime + *doxycycline or erythromycin + metronidazole	ceftriaxone or *spectinomycin + *doxycycline or erythromycin + metronidazole
Puerperal	amoxicillin-clavulanic acid + gentamicin	ampicillin + gentamicin + metronidazole
Meningitis	*oily chloramphenicol or ceftriaxone or ampicillin	
Eye infections		
Conjunctivitis	tetracycline eye ointment	*chloramphenicol eye drops
Trachoma	azithromycin	tetracycline eye ointment

Antibacterial combinations

Combining several antibacterials is only justified in severe infections (brucellosis, leprosy, tuberculosis, pelvic inflammatory disease, etc.).

Certain combinations should be avoided, as the action of one antibacterial can neutralise the action of another antibacterial administered simultaneously (e.g. penicillins and tetracyclines).

Principal antibacterial groups

Penicillin and derivatives

- Amoxicillin and ampicillin
- Benzylpenicillin (penicillin G)
- Benzathine benzylpenicillin (penicillin G benzathine)
- Procaine benzylpenicillin with or without benzylpenicillin
- Cloxacillin
- Phenoxymethylpenicillin (penicillin V)

Fast-acting penicillins

– Benzylpenicillin should be reserved for treating severe infections. Due to rapid elimination, an injection every 4 to 6 hours is required, which is impossible if the patient is not hospitalised.

– Oral phenoxymethylpenicillin is used in the treatment of tonsillitis.

Long-acting penicillins

– Benzathine benzylpenicillin has a concentration that slowly increases in the 24 hours following the injection. It remains active for 15 to 20 days. Due to its delayed action and low concentration in the blood, its use is restricted to infections susceptible to penicillin that evolve slowly. Its use is contra-indicated in acute infections. It is only administered by IM route.

– Procaine benzylpenicillin has the advantage of being injected only once every 24 hours. It acts rapidly (45 to 60 minutes) and is only administered by IM route.

– The combination of procaine benzylpenicillin and benzylpenicillin is also known as fortified penicillin procaine (PPF). It acts within 15 to 30 minutes after injection, thus more rapidly than procaine benzylpenicillin alone due to the presence of benzylpenicillin. It is only administered by IM route.

Penicillin derivatives

– Amoxicillin and ampicillin are broad-spectrum antibacterials with good tissue penetration and are therefore used for many infections. They are often used in pregnant women, for whom other antibacterials are frequently contra-indicated.

Amoxicillin is better absorbed through the intestinal tract than ampicillin and therefore requires lower oral doses.
For oral administration, use amoxicillin rather than ampicillin. On the other hand, injectable ampicillin is preferable to injectable amoxicillin. Injectable forms should be reserved for severe infections only.

– Cloxacillin is a narrow-spectrum antibacterial, essentially limited to treatment of staphylococcal infections, most of which have become resistant to penicillin.

Macrolides

- Erythromycin
- Azithromycin

– Erythromycin is reserved for penicillin-allergic patients.

– Azithromycin is effective as a single-dose for the treatment of *Chlamydia trachomatis* infections, due to its prolonged half-life.

Chloramphenicols

- Chloramphenicol
- Long-acting oily chloramphenicol

– Chloramphenicol is a broad-spectrum antibacterial, effective against numerous infections.Due to its effectiveness and low cost, it is still widely used. However, due to its potential haematotoxicity, its use should be restricted to severe infections when other less toxic antibacterials are not effective or are contra-indicated.
Oral treatment is more effective than parenteral treatment: blood and tissue concentrations are higher when chloramphenicol is given orally.

– Oily chloramphenicol is reserved for meningococcal meningitis epidemics.

Sulphonamides

- Sulfadiazine
- Sulfadoxine
- Cotrimoxazole (sulfamethoxazole + trimethoprim)

Simple sulphonamides

– Sulfadiazine combined with pyrimethamine is the first-line treatment of toxoplasmosis.

– Sulfadoxine is a long-acting sulphonamide (approximately one week). Due to the existence of resistant strains it should not be used for meningitis or cholera epidemics.

– The use of non-absorbable sulphonamides (sulfaguanidine, etc.) is not recommended as they are ineffective in the majority of intestinal infections of bacterial origin.

Combined sulphonamides

– The combination of a sulphonamide-trimethoprim (cotrimoxazole) benefits from the synergic effect of both active ingredients. Indications are more numerous than for sulphonamides alone. However, there are an increasing number of strains resistant to cotrimoxazole.

Tetracyclines

- Doxycycline
- Tetracycline

– Due to the multiplication of organisms resistant to tetracyclines, their use should be reserved for specific infections: brucellosis, cholera, borreliosis, typhus, chlamydial infections and certain pneumopathies.

– Doxycycline has the advantage of being administered in a single dose for the treatment of cholera, epidemic typhus, or relapsing fevers.

Aminoglycosides

- Gentamicin
- Spectinomycin
- Streptomycin

Due to their toxicity (irreversible ototoxicity, severe renal impairment, allergic reactions), aminoglycosides should only be prescribed for their specific indications and ensuring the monitoring of auditory and renal function.

Cephalosporins

- Cefixime
- Ceftriaxone

Cefixime and ceftriaxone are third-generation cephalosporins particularly active against Gram-negative bacteria. These are an alternative to fluoroquinolones when the latter are to be avoided, especially in children and pregnant women.

Quinolones

- Nalidixic acid
- Ciprofloxacin, ofloxacin, etc.

– First generation quinolones: nalidixic acid
Nalidixic acid is no longer recommended for the treatment of shigellosis. It may be used for the treatment of cystitis.

– Second generation quinolones (fluoroquinolones): ciprofloxacin, ofloxacin, etc.
Fluoroquinolones have a broader antibacterial spectrum than first-generation quinolones and have good tissular penetration. Their use should be reserved for the treatment of severe infections unresponsive to first-line antibacterials in order to avoid the emergence of resistant strains.

Nitrofuranes

- Nitrofurantoin

Nitrofurantoin may be prescribed as first-line treatment in cystitis, particularly in young women (except during the last month of pregnancy).

Antiseptics and disinfectants

Definition
Selection
Recommended antiseptics and dilutions
Preparation of antiseptic solutions
Preparation of disinfectant solutions for floors and surfaces
Use of disinfectant solutions for medical items

Definition

Antiseptics are products used for the disinfection (antisepsis) of living tissues (skin, wounds, mucous membranes).

Disinfectants are products used for the disinfection of objects and surfaces (floors, tables, etc.).

Certain products can be used both as an antiseptic and as a disinfectant, for example: polyvidone iodine, sodium tosylchloramide (chloramine-T) and certain formulations of sodium dichloroisocyanurate (NaDCC).

Selection

No single product can meet all the needs of a medical facility regarding cleaning, antisepsis and disinfection but in general, a restricted list will suffice and facilitate management (to avoid shortages, overstocks and incorrect use).

1 - Recommended list

– ordinary soap, usually available locally
– a detergent, usually available locally
– a chlorine-releasing compound:
  • preferably: NaDCC in a multi-purpose formulation which may be used for the disinfection of wounds, drinking water and surfaces
  • if not available: chloramine-T
– chlorhexidine-cetrimide
– polyvidone iodine
– gentian violet
– a phenolic detergent such as cresol saponated solution (lysol)

Remarks:

– *Alcohols (ethanol and isopropanol or isopropyl alcohol)*

If a restricted list of disinfectants must be selected, there are few advantages in choosing alcohols:
- their use is contraindicated on wounds and mucous membranes,
- they have no remanent effect. For indications where this effect is required, they must be used in combination with other disinfectants (Clinogel®, Sterilium®, Hibisprint®, etc.),
- they are expensive to transport by air,
- importation often requires complicated administrative procedures.

However, if ethanol and isopropanol are available locally, they can be useful to disinfect intact skin before injection or taking a blood sample, as its action is rapid (a few seconds). These products are more effective at 60-70° v/v than at 90-95°.

– *Glutaral/Glutaraldehyde*

Glutaraldehyde in 2% alkaline solution is a very potent disinfectant, non corrosive to metal. It may be used for the disinfection of semi-critical medical items (20 minutes) that cannot be sterilised by heat (e.g. laryngoscope blades), provided all recommendations are adequately followed:
- thorough cleaning before disinfection,
- complete immersion in "activated" glutaraldehyde solution,
- thorough rinsing to eliminate any residue,
- adequate drying.

The "activation" consists in the addition of the activator supplied with the product, which is intended to raise the pH to the alkaline value necessary for the efficacy of the solution. The activated solution has a limited shelf-life, between 2 to 4 weeks depending on the brand. Glutaraldehyde solution is very useful for endoscopes but its price and the constraints for safe use make it of limited interest for facilities with limited resources.
Glutaraldehyde solution releases toxic vapours and should therefore only be used in well ventilated wards (air extractor recommended).

2 - Non-recommended products

– Eosin: eosin is still frequently used as an antiseptic but it has a very narrow spectrum and its aqueous solutions are very easily contaminated by bacteria.

– Hydrogen peroxide (hydroperoxide): useful for the cleaning of dirty wounds but its efficacy is limited. Moreover, concentrated hydrogen peroxide is dangerous to transport and handle.

– Hexachlorophene: antiseptic with limited effectiveness and toxic for the central nervous system.

– Mercury compounds: phenylmercuric borate, merbromin (Mercurochrome®), mercurobutol (Mercryl®), thiomersal (Merthiolate®, Timerosal®). Aqueous solutions of these antiseptics have limited efficacy (very limited for merbromin). Alcoholic solutions are more effective. All mercury compounds, however, may cause serious adverse effects (toxic for kidneys, central nervous system and digestive tract; allergies). Moreover they pollute the environment. They must not be used.

– Ether: often wrongly used as an antiseptic. It has no disinfecting properties, but degreases the skin and removes sticky residues of elastoplast and similar dressings.

Recommended antiseptics and dilutions

Indications	Product to be used	Dilution	Remarks
– Insertion of IV devices – Insertion of urinary catheter – Lumbar puncture – Umbilical cord care – Pre-operative skin preparation (including perinea before delivery) – Skin disinfection before suturing – Post-operative wound (dressing) – Disinfection of injection site – Venepuncture	polyvidone iodine (PVI)	10% PVI concentrated solution	– Do not use with chlorhexidine or with chlorhexidine+cetrimide. – Do not use with mercury compounds (Mercurochrome®, Merbromin, Thiomersal®, etc.): can produce a toxic compound, risk of necrosis.
– Mouth washes		2 teaspoons of 10% PVI solution in 200 ml of water	
– Wounds, abscesses, ulcers	chlorhexidine+cetrimide	1.5% chlorhexidine + 15% cetrimide 2% dilution: = 20 ml/litre	– Do not use dilutions more than one week old. – Do not bring in contact with eyes, brain, meninges, ears, genital mucous membranes. – Do not use with soap (inactivation) and other antiseptics (incompatibility).
– Infected or necrotic wounds – Abscesses – Furuncles – Infected ulcers	NaDCC (or, if not available, chloramine-T)	1.67g NaDCC/litre = 1 tablet 1g available chlorine/litre (or 5 g chloramine-T/litre)	– Do not use solutions more than 3 days old (or 1 week if an opaque, dark coloured container is used). – Do not use a metal container. – For prolonged use, protect the intact skin around the wound with vaseline.
– Candidiasis (oral, mammary, diaper dermatitis) – Oozing superficial skin infections	gentian violet	0.5% solution (5g/litre) = 1 teaspoon per litre	– For preparation: shake several times, leave to settle. Filter or pour carefully into another bottle to eliminate any possible sediment. – Do not use dilutions more than one week old.

Preparation of antiseptic solutions

Although it may seem paradoxical, aqueous solutions of many antiseptics can be contaminated by pathogenic microorganisms during handling (especially *Pseudomonas aeruginosa*). Antiseptic solutions may be the cause of nosocomial infections.

To avoid this, the following precautions must be taken:

– Prepare all aqueous antiseptic solutions with clear water, that has been boiled for a few minutes and cooled.
– Renew all aqueous solutions at least once a week.
– Only prepare small amounts at a time to avoid wastage and the temptation of keeping expired solutions.
– Never mix a fresh solution with a "leftover" solution.
– Wash bottles with hot water and leave to dry before each refill.
– Never use a cork stopper because it promotes contamination (rough surface impossible to clean properly). Moreover cork inactivates certain antiseptics such as chlorhexidine.
– Mark on the bottles:
  • the name of the product,
  • its concentration,
  • the date of preparation or the date of expiry.

Every medical facility should define a clear policy concerning the renewal of its the antiseptic solutions.

Preparation of disinfectant solutions for floors and surfaces

– Dilutions of phenolic detergents such as cresol saponated solution should be prepared with clear water just before use (no need to boil the water).
– Chlorine solutions should be prepared with clear water just before use, in non metal containers (no need to boil the water).

Use of disinfectants for medical items

Disinfectants are used:
– to pre-disinfect soiled medical items in order to limit risks of contamination for cleaning staff,
– to disinfect clean medical items, in order to avoid patient-to-patient transmission of infections through medical items.

Use of disinfectants for pre-disinfection of soiled instruments

The cleaning of instruments, especially sharp instruments, carries a high risk for personnel, even if they wear gloves (e.g. risk of HIV or hepatitis B transmission). It is therefore recommended to use a disinfectant before the cleaning phase: this does not eliminate the risk but reduces it.

There is no ideal product i.e. effective on a broad spectrum of pathogens, not inactivated by organic matter, non corrosive to metal, and affordable in resource-limited settings.
Although NaDCC, calcium hypochlorite or chloramine-T are corrosive and inactivated by organic matter, will often be the safest choice if contact time and concentration recommendations are respected.
If available, use NaDCC as it less corrosive than calcium hypochlorite and faster acting than chloramine-T.

In practice:
– If pre-disinfecting soiled instruments immediately after use: soak instruments for 15 minutes in 0.1% available chlorine solution.
– If it is not possible to pre-disinfect soiled instruments immediately after use: leave instruments to soak in clear water to avoid the drying of organic matter until proceeding to pre-disinfection.

Soaking for too long (more than 30 minutes) and/or in a solution that is too concentrated will increase the risk of corrosion.

Use of disinfectants for disinfection of clean instruments

See table, following page.

"High level disinfection" consists in eliminating most of the germs present on a surface or object through immersion in a disinfectant solution for 20 minutes.

Only *heat sensitive semi-critical* items (rectal or oral thermometers, laryngoscope blades, etc.) must undergo "high level disinfection" between each patients.

"High level disinfection" does not replace sterilisation and must never be used for material that can be sterilised in an autoclave. Even after "high level disinfection", items cannot under any circumstances be considered sterile.

Reusable medical items must be carefully cleaned with soap and water before disinfection as disinfectants are only effective on clean surfaces.

Immersion in a "high-level disinfectant" should always be followed by thorough rinsing with sterile or boiled water.

Chemical disinfection or boiling are not sufficient for critical items, as bacterial spores are not destroyed. Chemical disinfection must not be used for critical items, especially syringes and needles.

The effectiveness of chemical disinfection can be impaired by error in dilution or deterioration of the product due to poor storages conditions.

Level of processing required according to classification/destination of medical items

Device classification	Examples	Level of asepsis required	Processing possibilities
Critical items – Items that contact normally sterile parts of the body. – Items through which circulate liquids that go into the vascular system or that contact sterile parts of the body.	Syringes, needles, trocarts, surgical instruments, urinary catheters, etc	Sterile at the time of use	Autoclave sterilization in appropriate wrapping or Single-use items
Semi-critical items Items that contact mucous membranes or non intact skin	Rectal or oral thermometer, nasal or vaginal speculum, laryngoscope blade, etc.	***Heat sensitive material:*** submitted to « high-level disinfection » between each patient	Disinfection by immersion for 20 minutes in 0.1% available chlorine solution (1000 ppm) or chloramine-T solution (20 g/litre)
		Heat resistant material: sterilized between each patient, but need not necessarily be kept sterile until use.	– Autoclave sterilization (wrapping not compulsory) – Boiling
Non critical items – Items that contact intact skin – Items that do not contact patients	Stethoscope, blood pressure cuff, examining table, wheel chairs, infusions supports, beds, weighing scales, etc.	Regularly cleaned and disinfected but not necessarily between each patient, except if they are soiled by blood[1] or other biological fluids or in case of infection requiring isolation.	To be chosen according to availability and type of item to be processed: – chlorine solution[2] – phenolics (1% lysol, chloroxylenol) – 70% ethanol or isopropanol

1 In this event, cover area with 1 % available chlorine solution (10 000 ppm), leave in contact for 10 minutes, wipe off with an absorbent material (to be discarded as contaminated waste), rinse and clean.

2 Chlorine solutions = solutions prepared preferably with sodium dichloroisocyanurate (NaDCC), if not available, with calcium hypochlorite (more corrosive) or chloramine-T (1 g/litre minimum), or, as last resort, with sodium hypochlorite (even more corrosive and very unstable to heat).

15th edition

Essential Medicines

WHO Model List (revised March 2007)

Explanatory Notes

The **core list** presents a list of minimum medicine needs for a basic health care system, listing the most efficacious, safe and cost-effective medicines for priority conditions. Priority conditions are selected on the basis of current and estimated future public health relevance, and potential for safe and cost-effective treatment.

The **complementary list** presents essential medicines for priority diseases, for which specialized diagnostic or monitoring facilities, and/or specialist medical care, and/or specialist training are needed. In case of doubt medicines may also be listed as complementary on the basis of consistent higher costs or less attractive cost-effectiveness in a variety of settings.

The square box symbol (□) is primarily intended to indicate similar clinical performance within a pharmacological class. The listed medicine should be the example of the class for which there is the best evidence for effectiveness and safety. In some cases, this may be the first medicine that is licensed for marketing; in other instances, subsequently licensed compounds may be safer or more effective. Where there is no difference in terms of efficacy and safety data, the listed medicine should be the one that is generally available at the lowest price, based on international drug price information sources.

Therapeutic equivalence is only indicated on the basis of reviews of efficacy and safety and when consistent with WHO clinical guidelines. National lists should not use a similar symbol and should be specific in their final selection, which would depend on local availability and price. Medicines are listed in alphabetical order, within sections.

The presence of an entry on the Essential Medicines List carries no assurance as to pharmaceutical quality. It is the responsibility of each local regulatory authority to ensure that each brand is of appropriate pharmaceutical quality (including stability) and that, when relevant, different brands are interchangeable.

Dosage forms of medicines are listed in alphabetical order and there is no implication of preference for one form over another. Standard treatment guidelines should be consulted for information on appropriate dosage forms.

Entries of the type *oral liquid* are intended to permit any solution, suspension or other form of liquid. Granules for reconstitution as an oral liquid may substitute for oral liquids, and typically carry benefits in the form of better stability and lower transport costs. If more than one type of oral liquid is available on the same market (e.g. solution, suspension, granules for reconstitution), they may be interchanged and in such cases should be bioequivalent. It is preferable that oral liquids do not contain sugar and that solutions for children do not contain alcohol.

Entries of the type *tablet* are intended to allow various forms of immediate-release tablet such as uncoated, film-coated, crushable, chewable, dispersible etc. Enteric coating, on the other hand, modifies drug release, and enteric-coated products are a modified release dosage form. Crushable, chewable and dispersible tablets may be easier to administer to paediatric populations and to the elderly.

1. ANAESTHETICS	
1.1 General anaesthetics and oxygen	
☐ halothane	**Inhalation.**
ketamine	**Injection:** 50 mg (as hydrochloride)/ml in 10-ml vial.
nitrous oxide	**Inhalation.**
oxygen	**Inhalation** (medicinal gas).
☐ thiopental	**Powder for injection:** 0.5 g; 1.0 g (sodium salt) in ampoule.
1.2 Local anaesthetics	
☐ bupivacaine	**Injection:** 0.25%; 0.5% (hydrochloride) in vial. **Injection for spinal anaesthesia:** 0.5% (hydrochloride) in 4-ml ampoule to be mixed with 7.5% glucose solution.
☐ lidocaine	**Injection:** 1%; 2% (hydrochloride) in vial. **Injection for spinal anaesthesia:** 5% (hydrochloride) in 2-ml ampoule to be mixed with 7.5% glucose solution. **Topical forms:** 2-4% (hydrochloride).
lidocaine + epinephrine (adrenaline)	**Dental cartridge:** 2% (hydrochloride) + epinephrine 1:80 000. **Injection:** 1%; 2% (hydrochloride) + epinephrine 1:200 000 in vial.
Complementary List	
ephedrine	***Injection:*** *30 mg (hydrochloride)/ml in 1-ml ampoule.* *(For use in spinal anaesthesia during delivery, to prevent hypotension).*
1.3 Preoperative medication and sedation for short-term procedures	
atropine	**Injection:** 1 mg (sulfate) in 1-ml ampoule.
☐ diazepam	**Injection:** 5 mg/ml in 2-ml ampoule. **Tablet**: 5 mg.
morphine	**Injection:** 10 mg (sulfate or hydrochloride) in 1-ml ampoule.
promethazine	**Oral liquid:** 5 mg (hydrochloride)/5 ml.
2. ANALGESICS, ANTIPYRETICS, NON-STEROIDAL ANTI-INFLAMMATORY MEDICINES (NSAIMs), MEDICINES USED TO TREAT GOUT AND DISEASE MODIFYING AGENTS IN RHEUMATOID DISORDERS (DMARDs)	
2.1 Non-opioids and non-steroidal anti-inflammatory medicines (NSAIMs)	
acetylsalicylic acid	**Suppository:** 50-150 mg. **Tablet:** 100-500 mg.
ibuprofen	**Tablet:** 200 mg; 400 mg.

paracetamol*	**Oral liquid:** 125 mg/5 ml. **Suppository:** 100 mg. **Tablet:** 100-500 mg. * Not recommended for anti-inflammatory use due to lack of proven benefit to that effect.
2.2 Opioid analgesics	
codeine	**Tablet:** 30 mg (phosphate).
morphine	**Injection:** 10 mg (morphine hydrochloride or morphine sulfate) in 1-ml ampoule. **Oral liquid:** 10 mg (morphine hydrochloride or morphine sulfate)/5 ml. **Tablet:** 10 mg (morphine sulfate). **Tablet (prolonged release):** 10 mg; 30 mg; 60 mg (morphine sulfate).
2.3 Medicines used to treat gout	
allopurinol	**Tablet:** 100 mg.
2.4 Disease modifying agents used in rheumatoid disorders (DMARDs)	
chloroquine	**Tablet:** 100 mg; 150 mg (as phosphate or sulfate).
Complementary List	
azathioprine	***Tablet:*** *50 mg.*
methotrexate	***Tablet:*** *2.5 mg (as sodium salt).*
penicillamine	***Capsule or tablet:*** *250 mg.*
sulfasalazine	***Tablet:*** *500 mg.*
3. ANTIALLERGICS AND MEDICINES USED IN ANAPHYLAXIS	
□ chlorphenamine	**Injection:** 10 mg (hydrogen maleate) in 1-ml ampoule. **Tablet:** 4 mg (hydrogen maleate).
dexamethasone	**Injection:** 4 mg dexamethasone phosphate (as disodium salt) in 1-ml ampoule.
epinephrine (adrenaline)	**Injection:** 1 mg (as hydrochloride or hydrogen tartrate) in 1-ml ampoule.
hydrocortisone	**Powder for injection:** 100 mg (as sodium succinate) in vial.
□ prednisolone*	**Tablet:** 5 mg; 25 mg * There is no evidence for complete clinical similarity between prednisolone and dexamethasone at high doses.

4. ANTIDOTES AND OTHER SUBSTANCES USED IN POISONINGS	
4.1 Non-specific	
charcoal, activated	**Powder.**
4.2 Specific	
acetylcysteine	**Injection:** 200 mg/ml in 10-ml ampoule.
atropine	**Injection:** 1 mg (sulfate) in 1-ml ampoule.
calcium gluconate	**Injection:** 100 mg/ml in 10-ml ampoule.
deferoxamine	**Powder for injection:** 500 mg (mesilate) in vial.
dimercaprol	**Injection in oil:** 50 mg/ml in 2-ml ampoule.
DL-methionine	**Tablet:** 250 mg.
methylthioninium chloride (methylene blue)	**Injection:** 10 mg/ml in 10-ml ampoule.
naloxone	**Injection:** 400 micrograms (hydrochloride) in 1-ml ampoule.
penicillamine	**Capsule or tablet:** 250 mg.
potassium ferric hexacyano-ferrate(II) - $2H_20$ (Prussian blue)	**Powder for oral administration.**
sodium calcium edetate	**Injection:** 200 mg/ml in 5-ml ampoule.
sodium nitrite	**Injection:** 30 mg/ml in 10-ml ampoule.
sodium thiosulfate	**Injection:** 250 mg/ml in 50-ml ampoule.
5. ANTICONVULSANTS/ANTIEPILEPTICS	
carbamazepine	**Oral liquid:** 100 mg/5 ml. **Tablet (chewable):** 100 mg; 200 mg. **Tablet (scored):** 100 mg; 200 mg.
□ diazepam	**Injection:** 5 mg/ml in 2-ml ampoule (intravenous or rectal).
magnesium sulfate*	**Injection:** 500 mg/ml in 2-ml ampoule; 500 mg/ml in 10-ml ampoule. * For use in eclampsia and severe pre-eclampsia and not for other convulsant disorders.
phenobarbital	**Injection:** 200 mg/ml (phenobarbital sodium). **Oral liquid:** 15 mg/5 ml (as phenobarbital or phenobarbital sodium). **Tablet:** 15-100 mg (phenobarbital).

phenytoin	**Capsule:** 25 mg; 50 mg; 100 mg (sodium salt). **Injection:** 50 mg/ml in 5-ml vial (sodium salt). **Oral liquid:** 25 - 30 mg/5 ml.* **Tablet:** 25 mg; 50 mg; 100 mg (sodium salt). **Tablet (chewable):** 50 mg. * The presence of both 25 mg/5 ml and 30 mg/5 ml strengths on the same market would cause confusion in prescribing and dispensing and should be avoided.
valproic acid	**Oral liquid:** 200 mg/5 ml. **Tablet (crushable):** 100 mg. **Tablet (enteric-coated):** 200 mg; 500 mg (sodium valproate).
Complementary List	
ethosuximide	***Capsule:*** *250 mg.* ***Oral liquid:*** *250 mg/5 ml.*
6. ANTI-INFECTIVE MEDICINES	
6.1 Anthelminthics	
6.1.1 Intestinal anthelminthics	
albendazole	**Tablet (chewable):** 400 mg.
levamisole	**Tablet:** 50 mg; 150 mg (as hydrochloride).
□ mebendazole	**Tablet (chewable):** 100 mg; 500 mg.
niclosamide*	**Tablet (chewable):** 500 mg. * Niclosamide is listed for use when praziquantel treatment fails.
praziquantel	**Tablet:** 150 mg; 600 mg.
pyrantel	**Oral liquid:** 50 mg (as embonate)/ml. **Tablet (chewable):** 250 mg (as embonate).
6.1.2 Antifilarials	
ivermectin	**Tablet (scored):** 3 mg; 6 mg.
Complementary List	
diethylcarbamazine	***Tablet:*** *50 mg; 100 mg (dihydrogen citrate).*
suramin sodium	***Powder for injection:*** *1 g in vial.*
6.1.3 Antischistosomals and antitrematode medicine	
praziquantel	**Tablet:** 600 mg.
triclabendazole	**Tablet:** 250 mg.

Complementary List	
*oxamniquine**	***Capsule:*** *250 mg.* ***Oral liquid:*** *250 mg/5 ml.* * *Oxamniquine is listed for use when praziquantel treatment fails.*
6.2 Antibacterials	
6.2.1 Beta Lactam medicines	
amoxicillin	**Capsule or tablet:** 250 mg; 500 mg (anhydrous). **Powder for oral liquid:** 125 mg (anhydrous)/5 ml.
amoxicillin + clavulanic acid	**Tablet:** 500 mg + 125 mg.
ampicillin	**Powder for injection:** 500 mg; 1 g (as sodium salt) in vial.
benzathine benzylpenicillin	**Powder for injection:** 1.44 g benzylpenicillin (=2.4 million IU) in 5-ml vial.
benzylpenicillin	**Powder for injection:** 600 mg (= 1 million IU); 3 g (= 5 million IU) (sodium or potassium salt) in vial.
cefazolin*	**Powder for injection:** 1 g (as sodium salt) in vial. * For surgical prophylaxis.
cefixime*	**Capsule:** 400 mg. * Only listed for single-dose treatment of uncomplicated ano-genital gonorrhoea.
☐ cloxacillin	**Capsule:** 500 mg; 1 g (as sodium salt). **Powder for injection:** 500 mg (as sodium salt) in vial. **Powder for oral liquid:** 125 mg (as sodium salt)/5 ml.
phenoxymethylpenicillin	**Powder for oral liquid:** 250 mg (as potassium salt)/5 ml. **Tablet:** 250 mg (as potassium salt).
procaine benzylpenicillin	**Powder for injection:** 1 g (=1 million IU); 3 g (=3 million IU) in vial.
Complementary List	
ceftazidime	***Powder for injection:*** *250 mg (as pentahydrate) in vial.*
☐ *ceftriaxone*	***Powder for injection:*** *250 mg, 1 g (as sodium salt) in vial.*
imipenem + cilastatin**	***Powder for injection:*** *250 mg (as monohydrate) + 250 mg (as sodium salt); 500 mg (as monohydrate) + 500 mg (as sodium salt) in vial.* * *Only listed for the treatment of life-threatening hospital-based infection due to suspected or proven multidrug-resistant infection.*

6.2.2 Other antibacterials	
azithromycin*	**Capsule:** 250 mg or 500 mg. **Oral liquid:** 200 mg/5 ml. * Only listed for single-dose treatment of genital *Chlamydia trachomatis* and of trachoma.
chloramphenicol	**Capsule:** 250 mg. **Oily suspension for injection:** 0.5 g (as sodium succinate)/ml in 2-ml ampoule. **Oral liquid:** 150 mg (as palmitate)/5 ml. **Powder for injection:** 1 g (sodium succinate) in vial.
☐ ciprofloxacin*	**Tablet:** 250 mg (as hydrochloride). * Final selection depends on indication for use.
doxycycline*	**Capsule or tablet:** 100 mg (hydrochloride). * Final selection depends on indication for use.
☐ erythromycin	**Capsule or tablet:** 250 mg (as stearate or ethyl succinate). **Powder for injection:** 500 mg (as lactobionate) in vial. **Powder for oral liquid:** 125 mg (as stearate or ethyl succinate).
☐ gentamicin*	**Injection:** 10 mg; 40 mg (as sulfate)/ml in 2-ml vial. * Final selection depends on indication for use.
☐ metronidazole	**Injection:** 500 mg in 100-ml vial. **Oral liquid:** 200 mg (as benzoate)/5 ml. **Suppository:** 500 mg; 1 g. **Tablet:** 200-500 mg.
nitrofurantoin	**Tablet:** 100 mg.
spectinomycin	**Powder for injection:** 2 g (as hydrochloride) in vial.
sulfamethoxazole + trimethoprim	**Injection:** 80 mg + 16 mg/ml in 5-ml and 10-ml ampoules. **Oral liquid:** 200 mg + 40 mg/5 ml. **Tablet:** 100 mg + 20 mg; 400 mg + 80 mg.
trimethoprim	**Tablet:** 100 mg; 200 mg.
Complementary List	
clindamycin	***Capsule:*** *150 mg.* ***Injection:*** *150 mg (as phosphate)/ml.*
sulfadiazine	***Injection:*** *250 mg (sodium salt) in 4-ml ampoule.* ***Tablet:*** *500 mg.*

vancomycin	***Powder for injection:*** *250 mg (as hydrochloride) in vial.*
6.2.3 Antileprosy medicines	
Medicines used in the treatment of leprosy should never be used except in combination. Combination therapy is essential to prevent the emergence of drug resistance. Colour coded blister packs (MDT blister packs) containing standard two medicine (paucibacillary leprosy) or three medicine (multibacillary leprosy) combinations for adult and childhood leprosy should be used. MDT blister packs can be supplied free of charge through WHO.	
clofazimine	**Capsule:** 50 mg; 100 mg.
dapsone	**Tablet:** 25 mg; 50 mg; 100 mg.
rifampicin	**Capsule or tablet:** 150 mg; 300 mg.
6.2.4 Antituberculosis medicines	
ethambutol	**Tablet:** 100-400 mg (hydrochloride).
isoniazid	**Tablet:** 100-300 mg. **Tablet (scored):** 50 mg.
isoniazid + ethambutol	**Tablet:** 150 mg + 400 mg.
pyrazinamide	**Tablet:** 400 mg. **Tablet (dispersible):** 150 mg. **Tablet (scored):** 150 mg.
rifampicin	**Capsule or tablet:** 150 mg; 300 mg.
rifampicin + isoniazid	**Tablet:** 60 mg + 30 mg; 150 mg + 75 mg; 300 mg + 150 mg. 60 mg + 60 mg **(For intermittent use three times weekly).** 150 mg + 150 mg **(For intermittent use three times weekly).**
rifampicin + isoniazid + ethambutol	**Tablet:** 150 mg + 75 mg + 275 mg.
rifampicin + isoniazid + pyrazinamide	**Tablet:** 60 mg + 30 mg + 150 mg; 150 mg + 75 mg + 400 mg. 150 mg + 150 mg + 500 mg **(For intermittent use three times weekly).**
rifampicin + isoniazid + pyrazinamide + ethambutol	**Tablet:** 150 mg + 75 mg + 400 mg + 275 mg.
streptomycin	**Powder for injection:** 1 g (as sulfate) in vial.
Complementary List	
Reserve second-line drugs for the treatment of multidrug-resistant tuberculosis (MDR-TB) should be used in specialized centres adhering to WHO standards for TB control.	
amikacin	***Powder for injection:*** *1000 mg in vial.*

p-aminosalicylic acid	***Granules:*** *4 g in sachet.* ***Tablet:*** *500 mg.*
capreomycin	***Powder for injection:*** *1000 mg in vial.*
cycloserine	***Capsule or tablet:*** *250 mg.*
ethionamide	***Tablet:*** *125 mg; 250 mg.*
kanamycin	***Powder for injection:*** *1000 mg in vial.*
*ofloxacin**	***Tablet:*** *200 mg; 400 mg.* ** Levofloxacin may be an alternative based on availability and programme considerations.*
6.3 Antifungal medicines	
clotrimazole	**Vaginal cream:** 1%; 10%. **Vaginal tablet:** 100 mg; 500 mg.
□ fluconazole	**Capsule:** 50 mg. **Injection:** 2 mg/ml in vial. **Oral liquid:** 50 mg/5 ml.
griseofulvin	**Capsule or tablet:** 125 mg; 250 mg.
nystatin	**Lozenge:** 100 000 IU. **Pessary:** 100 000 IU. **Tablet:** 100 000 IU; 500 000 IU.
Complementary List	
amphotericin B	***Powder for injection:*** *50 mg in vial.*
flucytosine	***Capsule:*** *250 mg.* ***Infusion:*** *2.5 g in 250 ml.*
potassium iodide	***Saturated solution.***
6.4 Antiviral medicines	
6.4.1 Antiherpes medicines	
□ aciclovir	**Powder for injection:** 250 mg (as sodium salt) in vial. **Tablet:** 200 mg.

6.4.2 Antiretrovirals	
Based on current evidence and experience of use, medicines in the following three classes of antiretrovirals are included as essential medicines for treatment and prevention of HIV (prevention of mother-to-child transmission and post exposure prophylaxis). The Committee emphasizes the importance of using these products in accordance with global and national guidelines. The Committee recommends and endorses the use of fixed-dose combinations and the development of appropriate new fixed-dose combinations, including modified dosage forms, non-refrigerated products and paediatric dosage forms with assured pharmaceutical quality.	
6.4.2.1 Nucleoside/Nucleotide reverse transcriptase inhibitors	
abacavir (ABC)	**Oral liquid:** 100 mg (as sulfate)/5 ml. **Tablet:** 300 mg (as sulfate).
didanosine (ddI)	**Buffered powder for oral liquid:** 100 mg; 167 mg; 250 mg packets. **Capsule (unbuffered enteric-coated):** 125 mg; 200 mg; 250 mg; 400 mg. **Tablet (buffered chewable, dispersible):** 25 mg; 50 mg; 100 mg; 150 mg; 200 mg.
emtricitabine (FTC)*	**Capsule:** 200 mg. **Oral liquid:** 10 mg/ml. * FTC is an acceptable alternative to 3TC, based on knowledge of the pharmacology, the resistance patterns and clinical trials of antiretrovirals.
lamivudine (3TC)	**Oral liquid:** 50 mg/5 ml. **Tablet:** 150 mg.
stavudine (d4T)	**Capsule:** 15 mg; 20 mg; 30 mg; 40 mg.* * The Committee expects this dosage form to be reviewed for possible deletion at the next meeting. **Powder for oral liquid:** 5 mg/5 ml.
tenofovir disoproxil fumarate (TDF)	**Tablet:** 300 mg (tenofovir disoproxil fumarate - equivalent to 245 mg tenofovir disoproxil).
zidovudine (ZDV or AZT)	**Capsule:** 100 mg; 250 mg. **Oral liquid:** 50 mg/5 ml. **Solution for IV infusion injection:** 10 mg/ml in 20-ml vial. **Tablet:** 300 mg.
6.4.2.2 Non-nucleoside reverse transcriptase inhibitors	
efavirenz (EFV or EFZ)	**Capsule:** 50 mg; 100 mg; 200 mg. **Oral liquid:** 150 mg/5 ml. **Tablet:** 600 mg.

nevirapine (NVP)	**Oral liquid:** 50 mg/5 ml. **Tablet:** 200 mg.
6.4.2.3 Protease inhibitors	
Selection of protease inhibitor(s) from the Model List will need to be determined by each country after consideration of international and national treatment guidelines and experience. Ritonavir is recommended for use in combination as a pharmacological booster, and not as an antiretroviral in its own right. This section will be reviewed by the Committee as a priority at its next meeting. It is expected that application for a heat stable tablet formulation containing 200/50 mg lopinavir + ritonavir will be submitted for the next meeting.	
indinavir (IDV)	**Capsule:** 200 mg; 333 mg; 400 mg (as sulfate).
lopinavir + ritonavir (LPV/r)	**Capsule:** 133.3 mg + 33.3 mg. **Oral liquid:** 400 mg + 100 mg/5 ml.
nelfinavir (NFV)	**Oral powder:** 50 mg/g. **Tablet:** 250 mg (as mesilate).
ritonavir	**Oral liquid:** 400 mg/5 ml. **Oral solid dosage form:** 100 mg.
saquinavir (SQV)	**Capsule:** 200 mg.
FIXED-DOSE COMBINATIONS	
efavirenz + emtricitabine* + tenofovir	**Tablet:** 600 mg + 200 mg + 300 mg. * FTC is an acceptable alternative to 3TC, based on knowledge of the pharmacology, the resistance patterns and clinical trials of antiretrovirals.
emtricitabine* + tenofovir	**Tablet:** 200 mg + 300 mg. * FTC is an acceptable alternative to 3TC, based on knowledge of the pharmacology, the resistance patterns and clinical trials of antiretrovirals.
stavudine + lamivudine + nevirapine	**Tablet:** 30 mg + 150 mg + 200 mg.
zidovudine + lamivudine	**Tablet:** 300 mg + 150 mg.
zidovudine + lamivudine + nevirapine	**Tablet**: 300 mg + 150 mg + 200 mg.
6.4.3 Other antivirals	
ribavirin	**Injection for intravenous administration:** 1000 mg and 800 mg in 10-ml phosphate buffer solution. **Oral solid dosage forms:** 200 mg; 400 mg; 600 mg.
6.5 Antiprotozoal medicines	
6.5.1 Antiamoebic and antigiardiasis medicines	
diloxanide	**Tablet**: 500 mg (furoate).

□ metronidazole	**Injection:** 500 mg in 100-ml vial. **Oral liquid:** 200 mg (as benzoate)/5 ml. **Tablet:** 200-500 mg.
6.5.2 Antileishmaniasis medicines	
□ meglumine antimoniate	**Injection**, 30%, equivalent to approximately 8.1% antimony in 5-ml ampoule.
paromomycin	**Solution for intramuscular injection:** 750 mg of paromomycin base present as the sulfate.
Complementary List	
amphotericin B	***Powder for injection:*** *50 mg in vial.*
pentamidine	***Powder for injection:*** *200 mg; 300 mg (isetionate) in vial.*
6.5.3 Antimalarial medicines	
6.5.3.1 For curative treatment	
Medicines for the treatment of *P. falciparum* malaria cases should be used in combination. The list currently recommends combinations according to treatment guidelines. The Committee recognizes that not all of these FDCs exist and encourages their development and rigorous testing. The Committee also encourages development and testing of rectal dosage formulations.	
amodiaquine*	**Tablet:** 153 mg or 200 mg (as hydrochloride). * To be used (a) in combination with artesunate 50 mg OR (b) may be used alone for the treatment of *P.vivax, P.ovale and P.malariae* infections.
artemether	**Oily injection:** 80 mg/ml in 1-ml ampoule. For use in the management of severe malaria.
artemether + lumefantrine*	**Tablet:** 20 mg + 120 mg. * Not recommended in the first trimester of pregnancy or in children below 5 kg.
artesunate*	**Injection:** ampoules, containing 60 mg anhydrous artesunic acid with a separate ampoule of 5% sodium bicarbonate solution. For use in the management of severe malaria. **Tablet:** 50 mg. * To be used in combination with either amodiaquine, mefloquine or sulfadoxine + pyrimethamine.
chloroquine*	**Oral liquid:** 50 mg (as phosphate or sulfate)/5 ml. **Tablet:** 100 mg; 150 mg (as phosphate or sulfate). * For use only for the treatment of *P.vivax* infection.
doxycycline*	**Capsule:** 100 mg (as hydrochloride). **Tablet (dispersible):** 100 mg (as monohydrate). * For use only in combination with quinine.

mefloquine*	**Tablet:** 250 mg (as hydrochloride). * To be used in combination with artesunate 50 mg.
primaquine*	**Tablet:** 7.5 mg; 15 mg (as diphosphate) * Only for use to achieve radical cure of *P.vivax* and *P.ovale* infections, given for 14 days.
quinine*	**Injection:** 300 mg quinine hydrochloride/ml in 2-ml ampoule. **Tablet:** 300 mg (quinine sulfate) or 300 mg (quinine bisulfate). * For use only in the management of severe malaria, and should be used in combination with doxycycline.
sulfadoxine + pyrimethamine*	**Tablet:** 500 mg + 25 mg. * Only in combination with artesunate 50 mg.
6.5.3.2 For prophylaxis	
chloroquine*	**Oral liquid:** 50 mg (as phosphate or sulfate)/5 ml. **Tablet:** 150 mg (as phosphate or sulfate). * For use only in central American regions, for use for *P.vivax*.
doxycycline	**Capsule or tablet:** 100 mg (hydrochloride).
mefloquine	**Tablet:** 250 mg (as hydrochloride).
proguanil*	**Tablet:** 100 mg (hydrochloride). * For use only in combination with chloroquine.
6.5.4 Antipneumocystosis and antitoxoplasmosis medicines	
pyrimethamine	**Tablet:** 25 mg.
sulfamethoxazole + trimethoprim	**Injection**: 80 mg + 16 mg/ml in 5-ml ampoule; 80 mg + 16 mg/ml in 10-ml ampoule.
Complementary List	
pentamidine	***Tablet:** 200 mg; 300 mg.*
6.5.5 Antitrypanosomal medicines	
6.5.5.1 African trypanosomiasis	
Medicines for the treatment of 1st stage African trypanosomiasis	
pentamidine*	**Powder for injection:** 200 mg (pentamidine isetionate) in vial. * To be used for the treatment of *Trypansoma brucei gambiense* infection.
suramin sodium*	**Powder for injection:** 1 g in vial. * To be used exclusively for the treatment of the initial phase of *Trypansoma brucei rhodesiense* infection.
Medicines for the treatment of 2nd stage African trypanosomiasis	
eflornithine	**Injection:** 200 mg (hydrochloride)/ml in 100-ml bottle.

melarsoprol	**Injection:** 3.6% solution, 5-ml ampoule (180 mg of active compound).
6.5.5.2 American trypanosomiasis	
benznidazole	**Tablet:** 100 mg.
nifurtimox	**Tablet:** 30 mg; 120 mg; 250 mg.
7. ANTIMIGRAINE MEDICINES	
7.1 For treatment of acute attack	
acetylsalicylic acid	**Tablet:** 300-500 mg.
paracetamol	**Tablet:** 300-500 mg.
7.2 For prophylaxis	
□ propranolol	**Tablet:** 20 mg; 40 mg (hydrochloride).
8. ANTINEOPLASTIC, IMMUNOSUPPRESSIVES AND MEDICINES USED IN PALLIATIVE CARE	
8.1 Immunosuppressive medicines	
Complementary List	
azathioprine	***Powder for injection:*** *100 mg (as sodium salt) in vial.* ***Tablet:*** *50 mg.*
ciclosporin	***Capsule:*** *25 mg.* ***Concentrate for injection:*** *50 mg/ml in 1-ml ampoule for organ transplantation.*
8.2 Cytotoxic medicines This section is expected to be reviewed at the next meeting.	
Complementary List	
asparaginase	***Powder for injection:*** *10 000 IU in vial.*
bleomycin	***Powder for injection:*** *15 mg (as sulfate) in vial.*
calcium folinate	***Injection:*** *3 mg/ml in 10-ml ampoule.* ***Tablet:*** *15 mg.*
chlorambucil	***Tablet:*** *2 mg.*
cisplatin	***Powder for injection:*** *10 mg; 50 mg in vial.*
cyclophosphamide	***Powder for injection:*** *500 mg in vial.* ***Tablet:*** *25 mg.*
cytarabine	***Powder for injection:*** *100 mg in vial.*
dacarbazine	***Powder for injection:*** *100 mg in vial.*
dactinomycin	***Powder for injection:*** *500 micrograms in vial.*
daunorubicin	***Powder for injection:*** *50 mg (as hydrochloride).*

doxorubicin	***Powder for injection:*** *10 mg; 50 mg (hydrochloride) in vial.*
etoposide	***Capsule:*** *100 mg.* ***Injection:*** *20 mg/ml in 5-ml ampoule.*
fluorouracil	***Injection:*** *50 mg/ml in 5-ml ampoule.*
mercaptopurine	***Tablet:*** *50 mg.*
methotrexate	***Powder for injection:*** *50 mg (as sodium salt) in vial.* ***Tablet:*** *2.5 mg (as sodium salt).*
procarbazine	***Capsule:*** *50 mg (as hydrochloride).*
vinblastine	***Powder for injection:*** *10 mg (sulfate) in vial.*
vincristine	***Powder for injection:*** *1 mg; 5 mg (sulfate) in vial.*
8.3 Hormones and antihormones	
Complementary List	
dexamethasone	***Injection:*** *4 mg dexamethasone phosphate (as disodium salt) in 1-ml ampoule.*
hydrocortisone	***Powder for injection:*** *100 mg (as sodium succinate) in vial.*
□ *prednisolone**	***Tablet:*** *5 mg; 25 mg.* ** There is no evidence for complete clinical similarity between prednisolone and dexamethasone at high doses.*
tamoxifen	***Tablet:*** *10 mg; 20 mg (as citrate).*
8.4 Medicines used in palliative care	
The WHO Expert Committee recognizes the importance of listing specific medicines in the Palliative Care Section. Some medicines currently used in palliative care are included in the relevant sections of the Model List, according to their therapeutic use, e.g. analgesics. The Guidelines for Palliative Care that were referenced in the previous list are in need of update. The Committee expects applications for medicines needed for palliative care to be submitted for the next meeting.	
9. ANTIPARKINSONISM MEDICINES	
biperiden	**Injection**: 5 mg (lactate) in 1-ml ampoule. **Tablet:** 2 mg (hydrochloride).
levodopa + □ carbidopa	**Tablet:** 100 mg + 10 mg; 250 mg + 25 mg.
10. MEDICINES AFFECTING THE BLOOD	
10.1 Antianaemia medicines	
ferrous salt	**Oral liquid:** equivalent to 25 mg iron (as sulfate)/ml. **Tablet:** equivalent to 60 mg iron.
ferrous salt + folic acid	**Tablet** equivalent to 60 mg iron + 400 micrograms folic acid (Nutritional supplement for use during pregnancy).
folic acid	**Tablet:** 1 mg; 5 mg.

hydroxocobalamin	**Injection:** 1 mg in 1-ml ampoule.
10.2 Medicines affecting coagulation	
heparin sodium	**Injection:** 1000 IU/ml; 5000 IU/ml; 20,000 IU/ml in 1-ml ampoule.
phytomenadione	**Injection:** 10 mg/ml in 5-ml ampoule. **Tablet**: 10 mg.
protamine sulfate	**Injection:** 10 mg/ml in 5-ml ampoule.
□ warfarin	**Tablet:** 1 mg; 2 mg; 5 mg (sodium salt).
11. BLOOD PRODUCTS AND PLASMA SUBSTITUTES	
11.1 Plasma substitutes	
□ dextran 70*	**Injectable solution:** 6%. * Polygeline, injectable solution, 3.5% is considered as equivalent.
11.2 Plasma fractions for specific use	
All plasma fractions should comply with the WHO Requirements for the Collection, Processing and Quality Control of Blood, Blood Components and Plasma Derivatives (Revised 1992). (WHO Technical Report Series, No. 840, 1994, Annex 2).	
Complementary List	
human normal immunoglobulin	***Intramuscular administration:*** *16% protein solution.* ***Intravenous administration:*** *5%, 10% protein solution.*
□ *factor VIII concentrate*	***Dried.***
□ *factor IX complex (coagulation factors, II, VII, IX, X) concentrate*	***Dried.***
12. CARDIOVASCULAR MEDICINES	
12.1 Antianginal medicines	
□ atenolol	**Tablet**: 50 mg; 100 mg.
glyceryl trinitrate	**Tablet (sublingual):** 500 micrograms.
□ isosorbide dinitrate	**Tablet (sublingual):** 5 mg.
verapamil	**Tablet**: 40 mg; 80 mg (hydrochloride).
12.2 Antiarrhythmic medicines	
This subsection will be reviewed at the next meeting of the Expert Committee.	
□ atenolol	**Tablet:** 50 mg; 100 mg.
digoxin	**Injection:** 250 micrograms/ml in 2-ml ampoule. **Oral liquid:** 50 micrograms/ml. **Tablet:** 62.5 micrograms; 250 micrograms.
epinephrine (adrenaline)	**Injection:** 100 micrograms/ml (as acid tartrate or hydrochloride) in 10-ml ampoule.
lidocaine	**Injection:** 20 mg (hydrochloride)/ml in 5-ml ampoule.

verapamil	**Injection:** 2.5 mg (hydrochloride)/ml in 2-ml ampoule. **Tablet:** 40 mg; 80 mg (hydrochloride).
Complementary List	
☐ *procainamide*	***Injection:*** *100 mg (hydrochloride)/ml in 10-ml ampoule.*
☐ *quinidine*	***Tablet:*** *200 mg (sulfate).*
12.3 Antihypertensive medicines	
☐ amlodipine	**Tablet:** 5 mg.
☐ atenolol	**Tablet:** 50 mg; 100 mg.
☐ enalapril	**Tablet:** 2.5 mg.
hydralazine*	**Powder for injection**: 20 mg (hydrochloride) in ampoule. **Tablet:** 25 mg, 50 mg (hydrochloride). * Hydralazine is listed for use in the acute management of severe pregnancy-induced hypertension only. Its use in the treatment of essential hypertension is not recommended in view of the availability of more evidence of efficacy and safety of other medicines.
☐ hydrochlorothiazide	**Tablet (scored)**: 25 mg.
methyldopa*	**Tablet**: 250 mg. * Methyldopa is listed for use in the management of pregnancy-induced hypertension only. Its use in the treatment of essential hypertension is not recommended in view of the availability of more evidence of efficacy and safety of other medicines.
Complementary List	
sodium nitroprusside	***Powder for infusion:*** *50 mg in ampoule.*
12.4 Medicines used in heart failure	
This subsection will be reviewed at the next meeting of the Expert Committee.	
digoxin	**Injection:** 250 micrograms/ml in 2-ml ampoule. **Oral liquid:** 50 micrograms/ml. **Tablet:** 62.5 micrograms; 250 micrograms.
☐ enalapril	**Tablet:** 2.5 mg.
☐ furosemide	**Injection:** 10 mg/ml in 2-ml ampoule. **Tablet:** 40 mg.
☐ hydrochlorothiazide	**Tablet (scored):** 25 mg.
Complementary List	
dopamine	***Injection:*** *40 mg (hydrochloride)in 5-ml vial.*

12.5 Antithrombotic medicines	
acetylsalicylic acid	**Tablet:** 100 mg.
Complementary List	
streptokinase	***Powder for injection:*** *1.5 million IU in vial.*
12.6 Lipid-lowering agents	
□ simvastatin*	**Tablet:** 5 mg; 10 mg; 20 mg; 40 mg. * For use in high-risk patients.
13. DERMATOLOGICAL MEDICINES (topical)	
13.1 Antifungal medicines	
benzoic acid + salicylic acid	**Ointment or cream:** 6% + 3%.
□ miconazole	**Ointment or cream:** 2% (nitrate).
sodium thiosulfate	**Solution:** 15%.
Complementary List	
selenium sulfide	***Detergent-based suspension:*** *2%.*
13.2 Anti-infective medicines	
□ methylrosanilinium chloride (gentian violet)	**Aqueous solution:** 0.5%. **Tincture:** 0.5%.
neomycin sulfate + □ bacitracin	**Ointment:** 5 mg neomycin sulfate + 250 IU bacitracin zinc/g.
potassium permanganate	**Aqueous solution:** 1:10 000.
silver sulfadiazine	**Cream:** 1%, in 500-g container.
13.3 Anti-inflammatory and antipruritic medicines	
□ betamethasone	**Ointment or cream:** 0.1% (as valerate).
□ calamine lotion	**Lotion.**
□ hydrocortisone	**Ointment or cream:** 1% (acetate).
13.4 Astringent medicines	
aluminium diacetate	**Solution**: 5%.
13.5 Medicines affecting skin differentiation and proliferation	
benzoyl peroxide	**Lotion or cream:** 5%.
coal tar	**Solution:** 5%.
dithranol	**Ointment:** 0.1%-2%.
fluorouracil	**Ointment:** 5%.
□ podophyllum resin	**Solution:** 10-25%.
salicylic acid	**Solution:** 5%.

urea	**Ointment or cream:** 10%.
13.6 Scabicides and pediculicides	
☐ benzyl benzoate	**Lotion:** 25%.
permethrin	**Cream:** 5%. **Lotion:** 1%.
14. DIAGNOSTIC AGENTS	
14.1 Ophthalmic medicines	
fluorescein	**Eye drops:** 1% (sodium salt).
☐ tropicamide	**Eye drops:** 0.5%.
14.2 Radiocontrast media	
☐ amidotrizoate	**Injection:** 140-420 mg iodine (as sodium or meglumine salt)/ml in 20-ml ampoule.
barium sulfate	**Aqueous suspension.**
☐ iohexol	**Injection:** 140-350 mg iodine/ml in 5-ml; 10-ml; 20-ml ampoules.
Complementary List	
☐ *meglumine iotroxate*	***Solution:** 5-8 g iodine in 100-250 ml.*
15. DISINFECTANTS AND ANTISEPTICS	
15.1 Antiseptics	
☐ chlorhexidine	**Solution:** 5% (digluconate) for dilution.
☐ ethanol	**Solution:** 70% (denatured).
☐ polyvidone iodine	**Solution:** 10%.
15.2 Disinfectants	
☐ chlorine base compound	**Powder:** (0.1% available chlorine) for solution.
☐ chloroxylenol	**Solution:** 4.8%.
glutaral	**Solution:** 2%.
16. DIURETICS	
amiloride	**Tablet:** 5 mg (hydrochloride).
☐ furosemide	**Injection**: 10 mg/ml in 2-ml ampoule. **Tablet**: 40 mg.
☐ hydrochlorothiazide	**Tablet (scored):** 25 mg.
mannitol	**Injectable solution**: 10%; 20%.
spironolactone	**Tablet:** 25 mg.

17. GASTROINTESTINAL MEDICINES	
17.1 Antacids and other antiulcer medicines	
aluminium hydroxide	**Oral liquid:** 320 mg/5 ml. **Tablet:** 500 mg.
□ ranitidine	**Injection:** 25 mg/ml in 2-ml ampoule. **Oral liquid:** 75 mg/5 ml. **Tablet**: 150 mg (as hydrochloride).
magnesium hydroxide	**Oral liquid:** equivalent to 550 mg magnesium oxide/10 ml.
17.2 Antiemetic medicines	
metoclopramide	**Injection:** 5 mg (hydrochloride)/ml in 2-ml ampoule. **Tablet:** 10 mg (hydrochloride).
promethazine	**Injection:** 25 mg (hydrochloride)/ml in 2-ml ampoule. **Oral liquid:** 5 mg (hydrochloride)/5 ml. **Tablet:** 10 mg; 25 mg (hydrochloride).
17.3 Anti-inflammatory medicines	
□ sulfasalazine	**Retention enema.** **Suppository**: 500 mg. **Tablet:** 500 mg.
Complementary List	
□ *hydrocortisone*	***Retention enema.*** ***Suppository:*** *25 mg (acetate).* (the □ only applies to hydrocortisone retention enema).
17.4 Laxatives	
□ senna	**Tablet:** 7.5 mg (sennosides) (or traditional dosage forms).

17.5 Medicines used in diarrhoea	
17.5.1 Oral rehydration	
oral rehydration salts*	glucose: 75 mEq sodium: 75 mEq or mmol/l chloride: 65 mEq or mmol/l potassium: 20 mEq or mmol/l citrate: 10 mmol/l osmolarity: 245 mOsm/l glucose: 13.5 g/l sodium chloride: 2.6 g/l potassium chloride: 1.5 g/l trisodium citrate dihydrate+: 2.9 g/l + trisodium citrate dihydrate may be replaced by sodium hydrogen carbonate (sodium bicarbonate) 2.5 g/l. However, as the stability of this latter formulation is very poor under tropical conditions, it is only recommended when manufactured for immediate use. * In cases of cholera a higher concentration of sodium may be required.
17.5.2 Medicines for diarrhoea in children	
zinc sulfate*	**Oral liquid:** in 10 mg per unit dosage forms. **Tablet:** in 10 mg per unit dosage forms. * In acute diarrhoea zinc sulfate should be used as an adjunct to oral rehydration salts.
17.5.3 Antidiarrhoeal (symptomatic) medicines in adults	
codeine*	**Tablet:** 30 mg (phosphate). * The role of this item has been questioned and its continued inclusion on the list will be reviewed at the next meeting of the Expert Committee.
18. HORMONES, OTHER ENDOCRINE MEDICINES AND CONTRACEPTIVES	
18.1 Adrenal hormones and synthetic substitutes	
Addison's disease is a rare condition; adrenal hormones are already included in section 3.	
18.2 Androgens	
Complementary List	
testosterone	***Injection:*** *200 mg (enantate) in 1-ml ampoule.*
18.3 Contraceptives	
18.3.1 Oral hormonal contraceptives	
☐ ethinylestradiol + ☐ levonorgestrel	**Tablet:** 30 micrograms + 150 micrograms.
☐ ethinylestradiol + ☐ norethisterone	**Tablet:** 35 micrograms + 1.0 mg.
levonorgestrel	**Tablet:** 30 micrograms; 750 micrograms (pack of two); 1.5 mg.

18.3.2 Injectable hormonal contraceptives	
medroxyprogesterone acetate	**Depot injection:** 150 mg/ml in 1-ml vial.
medroxyprogesterone acetate + estradiol cypionate	**Injection:** 25 mg + 5 mg.
norethisterone enantate	**Oily solution:** 200 mg/ml in 1-ml ampoule.
18.3.3 Intrauterine devices	
copper-containing device	
18.3.4 Barrier methods	
condoms	
diaphragms	
18.3.5 Implantable contraceptives	
levonorgestrel-releasing implant	Two-rod levonorgestrel-releasing implant, each rod containing 75 mg of levonorgestrel (150 mg total).
18.4 Estrogens	
□ ethinylestradiol*	**Tablet:** 10 micrograms; 50 micrograms. * The public health relevance and/or comparative efficacy and/or safety of this item has been questioned and its continued inclusion on the list will be reviewed at the next meeting of the Expert Committee.
18.5 Insulins and other antidiabetic agents	
glibenclamide	**Tablet:** 2.5 mg; 5 mg.
insulin injection (soluble)	**Injection:** 40 IU/ml in 10-ml vial; 100 IU/ml in 10-ml vial.
intermediate-acting insulin	**Injection:** 40 IU/ml in 10-ml vial; 100 IU/ml in 10-ml vial (as compound insulin zinc suspension or isophane insulin).
metformin	**Tablet:** 500 mg (hydrochloride).
18.6 Ovulation inducers	
Complementary List	
clomifene	***Tablet:** 50 mg (citrate).*
18.7 Progestogens	
norethisterone*	**Tablet:** 5 mg. * The public health relevance and/or comparative efficacy and/or safety of this item has been questioned and its continued inclusion on the list will be reviewed at the next meeting of the Expert Committee.

Complementary List	
*medroxyprogesterone acetate**	***Tablet:*** *5 mg.* * The public health relevance and/or comparative efficacy and/or safety of this item has been questioned and its continued inclusion on the list will be reviewed at the next meeting of the Expert Committee.
18.8 Thyroid hormones and antithyroid medicines	
levothyroxine	**Tablet:** 50 micrograms; 100 micrograms (sodium salt).
potassium iodide	**Tablet:** 60 mg.
□ propylthiouracil	**Tablet:** 50 mg.
19. IMMUNOLOGICALS	
19.1 Diagnostic agents	
All tuberculins should comply with the WHO Requirements for Tuberculins (Revised 1985). WHO Expert Committee on Biological Standardization. Thirty-sixth report. (WHO Technical Report Series, No. 745, 1987, Annex 1).	
tuberculin, purified protein derivative (PPD)	**Injection.**
19.2 Sera and immunoglobulins	
All plasma fractions should comply with the WHO Requirements for the Collection, Processing and Quality Control of Blood, Blood Components and Plasma Derivatives (Revised 1992). WHO Expert Committee on Biological Standardization. Forty-third report. (WHO Technical Report Series, No. 840, 1994, Annex 2).	
anti-D immunoglobulin (human)	**Injection:** 250 micrograms in single-dose vial.
antitetanus immunoglobulin (human)	**Injection:** 500 IU in vial.
antivenom immunoglobulin*	**Injection.** * Exact type to be defined locally.
diphtheria antitoxin	**Injection:** 10 000 IU; 20 000 IU in vial.
□ rabies immunoglobulin	**Injection:** 150 IU/ml in vial.
19.3 Vaccines	
Selection of vaccines from the Model List will need to be determined by each country after consideration of international recommendations, epidemiology and national priorities. The list below details the vaccines for which there is either a recommendation from the Strategic Advisory Group of Experts on Immunization (SAGE) (http://www.who.int/immunization/sage_conclusions/en/index.html) and/or a WHO position paper (http://www.who.int/immunization/documents/positionpapers/en/index.html). This site will be updated as new position papers are published and contains the most recent information and recommendations. All vaccines should comply with the WHO Requirements for Biological Substances.	
BCG vaccine	
cholera vaccine	

diphtheria vaccine	
hepatitis A vaccine	
hepatitis B vaccine	
Haemophilus influenzae type b vaccine	
influenza vaccine	
Japanese encephalitis vaccine	
measles vaccine	
meningococcal meningitis vaccine	
mumps vaccine	
pertussis vaccine	
pneumococcal vaccine	
poliomyelitis vaccine	
rabies vaccine	
rotavirus vaccine	
rubella vaccine	
tetanus vaccine	
typhoid vaccine	
varicella vaccine	
yellow fever vaccine	
20. MUSCLE RELAXANTS (PERIPHERALLY-ACTING) AND CHOLINESTERASE INHIBITORS	
□ alcuronium	**Injection:** 5 mg (chloride)/ml in 2-ml ampoule.
neostigmine	**Injection:** 500 micrograms in 1-ml ampoule; 2.5 mg (metilsulfate) in 1-ml ampoule. **Tablet:** 15 mg (bromide).
suxamethonium	**Injection:** 50 mg (chloride)/ml in 2-ml ampoule. **Powder for injection** (chloride) in vial.
Complementary List	
pyridostigmine	***Injection**: 1 mg in 1-ml ampoule.* ***Tablet**: 60 mg (bromide).*
□ *vecuronium*	***Powder for injection**: 10 mg (bromide) in vial.*

21. OPHTHALMOLOGICAL PREPARATIONS	
This section will be reviewed at the next meeting of the Expert Committee.	
21.1 Anti-infective agents	
aciclovir	**Ointment:** 3% W/W.
☐ gentamicin*	**Solution (eye drops):** 0.3% (sulfate). * Final selection depends on indication for use.
☐ tetracycline	**Eye ointment:** 1% (hydrochloride).
21.2 Anti-inflammatory agents	
☐ prednisolone	**Solution (eye drops):** 0.5% (sodium phosphate).
21.3 Local anaesthetics	
☐ tetracaine	**Solution (eye drops):** 0.5% (hydrochloride).
21.4 Miotics and antiglaucoma medicines	
acetazolamide	**Tablet:** 250 mg.
☐ pilocarpine	**Solution (eye drops):** 2%; 4% (hydrochloride or nitrate).
☐ timolol	**Solution (eye drops):** 0.25%; 0.5% (as maleate).
21.5 Mydriatics	
atropine	**Solution (eye drops):** 0.1%; 0.5%, 1% (sulfate).
Complementary List	
epinephrine (adrenaline)	***Solution (eye drops):** 2% (as hydrochloride).*
22. OXYTOCICS AND ANTIOXYTOCICS	
22.1 Oxytocics	
☐ ergometrine	**Injection:** 200 micrograms (hydrogen maleate) in 1-ml ampoule.
oxytocin	**Injection:** 10 IU in 1-ml ampoule.
Complementary List	
misoprostol	***Vaginal tablet:** 25 micrograms.*
mifepristone – misoprostol**	***Tablet** 200 mg – **tablet** 200 micrograms.* ** Requires close medical supervision.*
Where permitted under national law and where culturally acceptable.	
22.2 Antioxytocics (tocolytics)	
nifedipine	**Immediate release capsule:** 10 mg.

23. PERITONEAL DIALYSIS SOLUTION	
Complementary List	
intraperitoneal dialysis solution (of appropriate composition)	***Parenteral solution.***
24. PSYCHOTHERAPEUTIC MEDICINES	
24.1 Medicines used in psychotic disorders	
☐ chlorpromazine	**Injection:** 25 mg (hydrochloride)/ml in 2-ml ampoule. **Oral liquid:** 25 mg (hydrochloride)/5 ml. **Tablet:** 100 mg (hydrochloride).
☐ fluphenazine	**Injection:** 25 mg (decanoate or enantate) in 1-ml ampoule.
☐ haloperidol	**Injection:** 5 mg in 1-ml ampoule. **Tablet:** 2 mg; 5 mg.
24.2 Medicines used in mood disorders	
24.2.1 Medicines used in depressive disorders	
☐ amitriptyline	**Tablet:** 25 mg (hydrochloride).
fluoxetine	**Capsule or tablet:** 20 mg (present as hydrochloride).
24.2.2 Medicines used in bipolar disorders	
carbamazepine	**Tablet (scored):** 100 mg; 200 mg.
lithium carbonate	**Capsule or tablet:** 300 mg.
valproic acid	**Tablet (enteric-coated):** 200 mg; 500 mg (sodium valproate).
24.3 Medicines used in generalized anxiety and sleep disorders	
☐ diazepam	**Tablet (scored):** 2 mg; 5 mg.
24.4 Medicines used for obsessive compulsive disorders and panic attacks	
clomipramine	**Capsule:** 10 mg; 25 mg (hydrochloride).
24.5 Medicines used in substance dependence programmes	
Complementary List	
☐ *methadone**	***Concentrate for oral liquid**: 5 mg/ml; 10 mg/ml (hydrochloride).* ***Oral liquid:** 5 mg/5 ml; 10 mg/5 ml.* ** The square box is added to include buprenorphine. The medicines should only be used within an established support programme.*
25. MEDICINES ACTING ON THE RESPIRATORY TRACT	
25.1 Antiasthmatic and medicines for chronic obstructive pulmonary disease	
☐ beclometasone	**Inhalation (aerosol):** 50 micrograms per dose (dipropionate); 250 micrograms (dipropionate) per dose.

epinephrine (adrenaline)	**Injection:** 1 mg (as hydrochloride or hydrogen tartrate) in 1-ml ampoule.
ipratropium bromide	**Inhalation (aerosol):** 20 micrograms/metered dose.
□ salbutamol	**Inhalation (aerosol):** 100 micrograms (as sulfate) per dose. **Injection:** 50 micrograms (as sulfate)/ml in 5-ml ampoule. **Oral liquid:** 2 mg/5 ml. **Respirator solution for use in nebulizers**: 5 mg (as sulfate)/ml. **Tablet:** 2 mg; 4 mg (as sulfate).
25.2 Other medicines acting on the respiratory tract	
caffeine citrate	**Injection:** 20 mg/ml (equivalent to 10 mg caffeine base/ml). **Oral liquid:** 20 mg/ml (equivalent to 10 mg caffeine base/ml).
26. SOLUTIONS CORRECTING WATER, ELECTROLYTE AND ACID-BASE DISTURBANCES	
26.1 Oral	
oral rehydration salts	See section 17.5.1.
potassium chloride	**Powder for solution.**
26.2 Parenteral	
glucose	**Injectable solution:** 5%; 10% isotonic; 50% hypertonic.
glucose with sodium chloride	**Injectable solution:** 4% glucose, 0.18% sodium chloride (equivalent to Na^+ 30 mmol/l, Cl- 30 mmol/l).
potassium chloride	**Solution**: 11.2% in 20-ml ampoule (equivalent to K^+ 1.5 mmol/ml, Cl^- 1.5 mmol/ml).
sodium chloride	**Injectable solution:** 0.9% isotonic (equivalent to Na^+ 154 mmol/l, Cl- 154 mmol/l.
sodium hydrogen carbonate	**Injectable solution**: 1.4% isotonic (equivalent to Na^+ 167 mmol/l, HCO_3- 167 mmol/l). **Solution**: 8.4% in 10-ml ampoule (equivalent to Na^+ 1000 mmol/l, HCO_3-1000 mmol/l).
□ sodium lactate, compound solution	**Injectable solution.**
26.3 Miscellaneous	
water for injection	2-ml; 5-ml; 10-ml ampoules.
27. VITAMINS AND MINERALS	
ascorbic acid	**Tablet:** 50 mg.
□ ergocalciferol	**Capsule or tablet:** 1.25 mg (50 000 IU). **Oral liquid:** 250 micrograms/ml (10 000 IU/ml).

iodine	**Capsule:** 200 mg. **Iodized oil:** 1 ml (480 mg iodine); 0.5 ml (240 mg iodine) in ampoule (oral or injectable); 0.57 ml (308 mg iodine) in dispenser bottle.
□ nicotinamide	**Tablet:** 50 mg.
pyridoxine	**Tablet:** 25 mg (hydrochloride).
retinol	**Capsule:** 50 000 IU; 100 000 IU; 200 000 IU (as palmitate). **Oral oily solution:** 100 000 IU (as palmitate)/ml in multidose dispenser. **Tablet (sugar-coated):** 10 000 IU (as palmitate). **Water-miscible injection:** 100 000 IU (as palmitate) in 2-ml ampoule.
riboflavin	**Tablet:** 5 mg.
sodium fluoride	In any appropriate topical formulation.
thiamine	**Tablet:** 50 mg (hydrochloride).
Complementary List	
calcium gluconate	***Injection:*** *100 mg/ml in 10-ml ampoule.*

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