REPUBLIC OF KENYA

MINISTRY OF HEALTH

BASIC PAEDIATRIC PROTOCOLS

for ages up to 5 years

February 2022

5th Edition

DRAFT

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Acknowledgements

The development of this 5th edition of the Basic Pediatric Protocol marks an important milestone in the efforts of the health sector to ensure that quality health services are provided to children under five years in Kenya. Its use is expected to contribute to provision of the highest quality of health care service delivery as envisaged in the Constitution of Kenya.

The Ministry of Health, expresses its gratitude to the members who made the original contribution to the protocol, and to the reviewers who have contributed to updating the guidelines in this book. The review was done through a long process of consultation, teamwork and information gathering. It was headed by Dr. Caroline Mwangi, Head, Division of Neonatal and Child Health in consultation with the various pediatric stakeholders.

We wish to thank everyone who reviewed most of the evidence and made recommendations to this protocol. Special thanks goes to Elsa Odira, Program Manager, Division of Neonatal and Child Health, and the core review team, Dr. Joy Odhiambo (Kisumu) Dr. Maryanne Wachu (Bomet) Dr. Abdullahi Rashid (Wajir) Dr. Rachael Kanguha (Tharaka Nithi) Dr. Brenda Oeba (Nyamira) Alice Nyimbaye (Homabay), Jason Kiruja (KNH), Dr Emelda A. Manguro (Machakos) and Beatrice Juma (Kisumu).

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February, 2022

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Foreword

This pocket book consists of guidelines on triage, assessment & classification of illness severity, criteria for admission, and inpatient management of the major causes of childhood morbidity & mortality such as pneumonia, diarrhea, malaria, severe acute malnutrition, meningitis, HIV, TB and neonatal conditions. The guidelines target management of the seriously ill newborn or child in the first 24 - 48 hours of arrival at hospital.

The booklet is aimed at doctors, clinical officers, nurses and other health workers responsible for the care of sick newborns and young children at all levels, although it mainly targets those who provide basic hospital care. It will also be useful for tertiary or university hospitals for defining basic evidence informed care to students in medical schools and other health training institutions. The guidelines presume health facilities that provide care should have the capacity to do essential investigations for common serious childhood illnesses and avail essential drugs for the care of seriously sick children.

The first edition was inspired by the WHO Book, "A Pocket Book of Hospital Care for Children" (2005 Edition). It has subsequently been updated based on specific and up to date reviews of emerging new research evidence and technologies using the GRADE approach.

The simplified algorithms in this booklet can be enlarged and used as job aides in emergency rooms (casualty and outpatient departments), paediatric wards, delivery rooms and newborn units. These guidelines will undergo periodic revision to keep abreast with new developments and hence continue to deliver quality care to the children of this nation. Updates or additional materials can be found at the websites: https://kenyapaediatric.org and www.guidelines.health.go.ke.

I thank KEMRI - Wellcome Trust Research Programme, the Kenya Paediatric Association, Division of Neonatal and Child Health, Department of Paediatrics and Child Health from the University of Nairobi for assisting in updating the guidelines.

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Principles of good care

1) Facilities must have basic equipment and drugs in stock at all times, and adequate staff skilled in paediatric care.

2) Sick children coming to hospital must be immediately triaged, assessed and if necessary, provided with emergency treatment as soon as possible.

3) Assessment of diagnosis and illness severity must be thorough and treatment must be carefully planned. All stages should be accurately and comprehensively documented.

4) The protocols provide a minimum standard and safe approach to most but not all common problems. Care needs to be taken to identify and treat children with less common problems rather than just applying the protocols.

5) All treatments should be clearly and carefully prescribed, usually based on a measurement of weight, on patient treatment sheets with doses checked by nurses before administration. (Please write dose frequency as 6hrly, 8hrly, 12hrly etc. rather than qid, tid, etc.)

6) The parents / caretakers need to understand what the illness and its treatment are. They provide invaluable assistance in caring for the child. Being polite to parents considerably improves communication.

7) The response to treatment needs to be assessed. For very severely ill children this should include a review in the first 6 hours of admission - such a review needs to be planned between medical and nursing staff and progress documented.

8) Correct supportive care - particularly adequate feeding, use of oxygen and fluids - is as important as disease specific care.

9) Laboratory tests should be used appropriately and use of unnecessary drugs should be avoided.

10) An appropriate discharge and follow up plan needs to be made as the child leaves hospital.

11) Good hand hygiene practices and good hygiene in the patient's environment improves outcomes for all sick children.

Specific policies

- ✓ All children and newborns admitted to hospital requiring medical treatment should have their own inpatient number and admission should be recorded using a standardized paediatric or newborn admission record form & inpatient registers.
- ✓ Treatments, including supportive care, should be fully and clearly prescribed.
- ✓ Medical records are legal documents and entries should be clear, accurate and signed with a date and time of the entry recorded.
- ✓ All paediatric admissions should be offered HIV testing using PITC.
- ✓ All newborn admissions aged ≤14 days should receive Vitamin K unless it has already been given.
- ✓ Routine immunization status should be checked and missed vaccines given before discharge.
- ✓ Every child with condition(s) that cannot be managed effectively with the available resources receives appropriate, timely referral, with seamless continuity of care.
- ✓ Assess for abuse, neglect or any other form of maltreatment and refer to the social worker
- ✓ All children with special needs should be assessed, managed or referred appropriately

Admission and assessment

- ✓ All admitted children must have weight recorded and used for calculation of fluids / feeds and drug doses.
- ✓ Length / Height should be measured with weight for height (WHZ) recorded and used to assess nutritional status for children.
- ✓ Mid-Upper Arm Circumference (MUAC) should be used for nutritional assessment for children > 6months of age.
- ✓ All vital signs should be taken including Temperature, Oxygen saturation, Pulse rates and Respiratory rates which must be counted for 1 minute, and Blood pressure.
- ✓ Conscious level should be assessed on all children admitted using the AVPU scale or an alternative such as the GCS (Glasgow coma scale) adapted for children.
- ✓ Children with AVPU < A should have their blood glucose checked. If not possible, treat for hypoglycemia.
- ✓ The sickest newborns / children in the ward should be near the nursing station (acute area) and prioritized for re-assessment / observations.

- Good hand hygiene saves lives and can be achieved by handwashing with soap and running water OR hand rubbing with alcohol-based rub (70%).
- Gloves do not protect patients and are not a substitute for hand hygiene
- If hands are visibly dirty, they must be cleaned first with soap and water.
- The alcohol hand-rub must be allowed to dry off to be effective.

The five moments of hand hygiene

All equipment used for patient care should be decontaminated appropriately according to IPC guidelines.

Hand hygiene technique

Duration of the entire procedure: 40 - 60 seconds

Wet hands with water;

Apply enough soap to cover all hand surfaces;

Rub hands palm to palm;

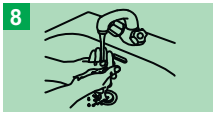
Right palm over left dorsum with interlaced fingers and vice versa;

Palm to palm with fingers interlaced;

Backs of fingers to opposing palms with fingers interlocked;

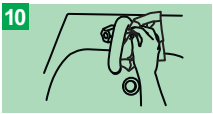
Rotational rubbing of left thumb clasped in right palm and vice versa;

Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



Rinse hands with water;

Dry hands thoroughly with a single use towel;



Use towel to turn off faucet;

Your hands are now safe.

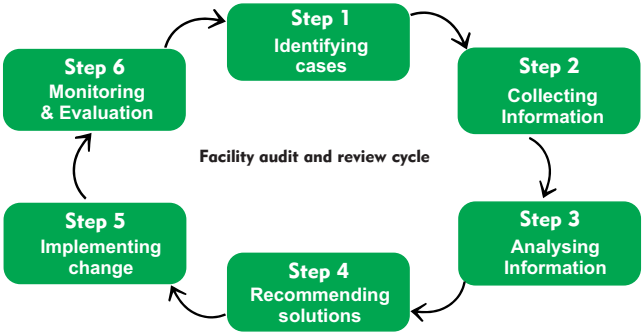
WHO guidelines on hand hygiene in health care 2009

1. Clinical audit is aimed at self-improvement and is not about finding who to blame.

2. Hospitals should have an audit team comprising 4 to 8 members, led by a senior clinician and including nurses, admin, lab technicians and nutritionists etc. 1-2 people, usually MO or CO interns and nurses should be selected on a rotating basis to perform the audit and report back to the audit team and department staff.

3. The aims are for hospitals to diagnose key problems in providing care. It is essential that identifying problems is linked to suggesting who needs to act, how, and by when to implement solutions. Follow up on whether progress is being achieved with new audits should be done to identify new problems and plan new actions etc.

4. Deaths and surviving cases should be audited within 24 hours as per the facility audit and review cycle below.



5. Use the audit framework tool (Table 1), to identify modifiable administrative factors, health worker related factors and patient oriented factors in collecting relevant information in step 2 of the audit review cycle.

Table 1: Audit framework tool

Administrative Factors	Health Worker Related Factors	Patient Orientated Factors
☐ Absence of guidelines to guide on diagnosis and management plan ☐ Absence of guidelines on appropriate use of equipment & supplies ☐ Lack of medication ☐ Lack of transportation/ referral mechanisms and delay in transportation within and in-between facilities ☐ Inadequate Human Resource for Health capacity and high staff turnover	☐ Lack of knowledge in case management, interpretation of investigations etc. ☐ Delay in executing management plan & increased turnaround time for tests/investigations & in reviewing of results ☐ Medical errors: incorrect medication, administration, poor monitoring practices ☐ Poor communication across cadres, departments and with parents/caregivers ☐ Poor documentation practice ☐ Delay in decision for referral within facility & In-between facilities.	☐ Poor accessibility to health facilities ☐ Delay in seeking treatment for child ☐ Refusal of treatment for child.

6. Use an audit tool to compare care given with recommendations in these protocols and other guidelines (e.g. for TB, HIV/AIDS) and the most up to date reference materials for less common conditions.

7. Look at assessments, diagnoses, investigations, treatments and whether what was planned was done correctly and recorded. Check doses and whether drugs / fluids / feeds are correct and actually given and if clinical review and nursing observations were adequate - **if it is not written down it was not done!**

8. This data can be used to provide accountability for results and compel decision makers to pay due attention and respond to the problems identified.

List of essential equipment (*for advanced care)

Airway

- Oropharyngeal airway
- Nasopharyngeal airway
- Laryngeal mask airway
- Endotracheal tubes*
- Suction devices
  - functional suction machine
  - penguin suckers
- Suction catheters

Breathing

- BVM (Ambu-bag)- 300ml for neonates, 500mls for older children
- Masks for BVM - sizes 00, 0, 1, 2
- Nasal prongs- neonatal, infant and child
- Non-rebreather masks- neonatal, infant and child
- Nasal catheter- infant and child
- Pulse oximeter with neonatal and paediatric probes
- Oxygen splitters
- Oxygen sources- concentrators, cylinders, piped oxygen
- Oxygen accessories- humidifiers, flowmeters, regulator and gauge
- CPAP machine
- Nebulizer kit
- Spacers

Circulation

- BP machine with cuffs for neonatal and paediatric
- IV cannulas- Gauges 26, 24, 22, 20, 18
- Infusion sets:
  - Paediatric burrettes
  - Infusion/syringe pump*
  - Blood-giving set with its burrette
- Cardiac monitors*
- Paediatric vacutainers
- Intraosseous needles

Disability

- Glucometer
- Pen torch
- Nasogastric tubes of different sizes

*where available

List of essential equipment (*for advanced care)

General

Power source with backup

- Thermometer
- Heater
- Radiant warmer
- Linen
- Weighing scale
  - Baby weighing scale
  - Child weighing scale
- Stadiometer
- Infantometer
- MUAC tapes
- ORT Corner Equipment
- Resuscitation couch/table
- Phototherapy machine
- Emergency tray or trolley

*where available

Doses (For overweight children, base dose calculation on median weight for age or height)

Acyclovir	Encephalitis: 20mg/kg IV 8hrly for 14 - 21 days
Adrenaline *1 in 10000*	Give 0.1ml/kg IV in resuscitation To make this strength dilute 1ml of 1 in 1000 adrenaline in 9mls water for injection to make10mls
Adrenaline *1 in 1000*	Severe viral croup 2ml of 1:1000 nebulized If effective repeat with careful monitoring
Adrenaline	For anaphylaxis < 6years: 150micrograms IM (0.15ml)
Ampicillin *1 in 1000*	Neonate: 50mg/kg/dose 12 hourly IV or IM if aged <7 days and 6 hourly if aged 8 - 28 days. Age 1month and over: 50mg/kg/dose (Max 500mg) 6 hourly IV/ IM
Artemether	Loading dose: 3.2mg/kg IM stat Maintenance dose: 1.6mg/kg IM 24hrly
Albendazole	Age < 2yrs, 200mg PO stat Age ≥ 2yrs, 400mg PO stat
Amikacin	15mg/kg once daily. Slow IV over 3-5 min Amikacin trough concentration should be monitored (if available) If serious gram - ve infection / resistance to gentamicin higher doses may be used with monitoring
Aminophylline	Newborn Loading dose 6mg/kg IV over 1 hour or rectal, Maintenance (IV or oral): Age 0 ≤ 6 days - 2.5mg/kg 12hrly, Age 7-28 days - 4mg /kg hourly
Amoxicillin	Use 25mg/kg/dose for simple infections and 40-45mg/kg for pneumonia (Newborn Page 72,other ages Page18)
Artesunate	In children ≤20Kg give 3mg/kg/dose of injectable artesunate (IV/IM) at 0,12 and 24 hours and continue once daily until oral administration is feasible If weight >20Kg give 2.4mg/kg/dose injectable artesunate at 0,12 and 24 hours and continue once daily until oral administration is feasible
Azithromycin	10mg/kg max 500mg PO daily for 3 days

Essential Drugs	**Doses** (For overweight children, base dose calculation on median weight for age or height)
Budesonide	pMDI with a spacer 200 micrograms daily (low dose)
Benzyl Penicillin *(Crystalline Penicillin)*	**Age ≤ 6days:** 50,000 iu/kg/dose 12 hourly IV or IM **Age 7 days and over:** 50,000 iu/kg/dose 6 hourly IV/IM *Newborn Page 72, other ages Page 17*
Caffeine Citrate	Loading dose oral: 20 mg/kg (or IV over 30 min) maintenance followed 12-24 hours by maintenance dose 5 mg/kg daily oral (or IV over 30 min)
Calcium (Monitor calcium especially if on Vitamin D or long term therapy)	**Symptomatic hypocalcemia (tetany/convulsions)** Initial IV bolus of 10% calcium gluconate: Neonate- 0.5-2ml/kg (0.11-0.46mmol/kg) for 1 dose, over 5-10mins Older child- 0.5ml/kg (0.11mmol/kg) to a maximum of 20ml (4.5mmol) over 5-10mins *then maintain on continuous IV infusion over:* Neonate - 0.5mmol/kg over 24hrs (2.3mls/kg/d) 1mo-1 year-1mmol/kg (max 8.8mmol) over 24hrs (4.5mls/kg/d) 2yrs- 5yrs- 8.8mmol over 24hrs (40ml/d) Switch to oral formulation as soon as possible **Mild Hypocalcemia:** Neonates: 50-150mg/kg/d oral elemental calcium divided 6hrly Older child: 50mg/kg/d oral elemental calcium divided 6hrly
Carbamazepine (PO)	**Age 1 m - 12yrs:** initially 5mg/kg at night, increased as necessary by 2.5-5mg/kg every 3-7 days; usual maintenance dose 5 mg/kg 2-3 times daily. *Avoid abrupt withdrawal and watch carefully for side effects*
Cefotaxime	Dosage if aged < 7days: Pre-term: 50mg/kg 12 hourly; Term aged < 7 days: 50mg/kg 8 hourly
Ceftazidime	Age < 7 days or weight < 1200g : 50 mg/kg IM/IV 12 hourly Age > 7 days or weight >1200 g : 50 mg/kg IM/IV 8 hourly 1 mo- 12 yrs : 30-50 mg/kg IM/IV 8 hourly (Max: 6 g/day) (for pseudemonal infections)
Ceftriaxone	Newborn Page 72, other Page 17
7.1% Chlorhexidine Digluconate Gel	Apply immediately after birth. For subsequent applications, clean the cord before application. Apply once daily up to the 7th day or until the cord falls off, whichever comes first

Ciprofloxacin

Dysentery dosing: Page 18
Note:may increase renal toxicity of gentamicin / amikacin)

Clotrimazole 1%

Use Clotrimazole paint for oral thrush and apply 2-3 times daily until cleared

Co-trimoxazole
(4mg/kg Trimethoprim &20mg/kg sulphamethoxazole)

Weight	240mg/5ml (syrup) *12 hrly*	480mg (tabs) *12 hrly*
2 - 3kg	2.5 mls	1/4
4 - 10kg	5 mls	1/2
11 - 15 kg	7.5 mls	1/2
16 - 20 kg	10 mls	1

Dexamethasone

IV or IM 0.6mg/kg stat *for severe viral croup*

Dextrose/glucose

5mls/kg 10% dextrose IV over 3-5 mins, *page15*
Neonate: 2 mls/kg

Dihydrocodeine

Age 1- 4 yrs : 0.5mg / kg every 4-6 hours
Age 4 - 12 yrs: 0.5 -1 mg/kg (max. 30 mg) every 4-6 hrs

Diazepam (*IV)*

0.3 mg/kg & See separate chart Page 15

Diazepam (*rectal)*

0.5mg/kg & *See separate chart Page 15*

Digoxin *(oral)*

Age 2-5 yrs: initially 35 micrograms/kg in 3 divided doses for 24 hrs then 10 micrograms/kg daily in 1-2 doses

Age 5-10 yrs: initially 25 micrograms/kg *(max 750 micrograms)* in 3 divided doses for 24 hours then 6 micrograms/kg daily *(max.250 micrograms daily) in 1-2 doses*

Age 10-12 yrs: initially 0.75-1.5 mg in 3 divided doses for 24 hrs then 62.5-250 micrograms daily in 1-2 doses

Essential Drugs	**Doses** (For overweight children, base dose calculation on median weight for age or height)
Erythromycin	30-50 mg/kg/day in 3-4 divided doses; max: 2 g/day
Flucloxacillin	Newborn Page 72, other Page 17 & 18
Fluconazole	Oral Candidiasis: PO/IV 6mg/kg on day 1, then 3mg/kg/d Esophageal/systemic candidiasis: PO/IV 12mg/kg on day 1 then 6mg/kg/d
Gentamicin	7.5 mg/kg/24 hr IM or slow IV Newborn Page 72, other Page 17
Hydroxyurea	*(For severe SCD only: Pain >3 episodes/ yr; stroke; transfusion ≥ 2/ yr; acute chest syndrome)* Child 2-12 years initially 10-15mg/kg once daily, increased every 12 weeks in steps of 2.5 - 5 mg/kg daily according to response; usual dose 15 - 30 mg/kg daily (max. 35 mg/kg daily)
Ibuprofen	5 - 10 mg/kg 8 hourly
Iron (Fe)	**Iron deficiency anaemia**: Pre-term infant: 2-4 mg elemental Fe/kg/day max dose: 15 mg elemental Fe/day **Child:** 3 - 6 mg elemental Fe/kg/day **Prophylaxis:** Pre-term infant 2-4 mg elemental Fe/kg/24 hr max dose: 15 mg elemental Fe/day Term: 1-2mg elemental Fe/24 hr Max 15mg per day
Lactulose	**Hepatic Encephalopathy Infants:** 1.7-6.7 g/day (2.5 -10 mL) orally daily divided in 3 to 4 doses. Adjust dosage to produce 2 - 3 soft stools per day. **Children:** 25-60 g/day (40-90 mL) orally daily divided in 3-4 doses. Adjust dosage to produce 2-3 soft stools/day. **Chronic constipation:** Children: 0.7-2 gm/kg/day (1 to 3 mL/kg/day) orally in divided doses daily; not to exceed 40 g/day (60 mL/day).
Levetiracetam	Loading dose: 30mg/kg IV infusion over 15 mins then Maintenance dose: 30mg/kg/day divided into two doses to start 12 hours after the loading dose.
Lorazepam	0.1mg/kg IV over 30-60 seconds Max dose 4mg (Page 15)
Metronidazole	*Newborn Page 72 other Page 17 & 18*

	Doses (For overweight children, base dose calculation on median weight for age or height)
Midazolam	(buccal for management of convulsions) 1-2 months 0.3mg/kg to a maximum of 2.5mg/dose 3-11 months: 2.5mg per dose 1-4 yrs: 5mg/dose
Morphine	**Neonate:** 0.05 - 0.2 mg/kg/dose IM, SC, slow IV every 4hr **Infant and Child:** PO 0.2-0.5 mg/kg/dose every 4-6 hr as needed IM IV/SC 0.1-0.2 mg/kg/dose every 2-4 hrs as needed Max 15 mg/dose
Naloxone	Acute opioid overdose: <5years: 0.1mg/kg per dose. Repeat two-three times if needed. Do not exceed 2mg per dose
Nystatin	Neonates 0.5ml (50,000 U), Infants 1ml (100,000 U), Older child 2-3ml (200,000-300,000IU) to each side of the mouth 6 hrly (2 weeks if HIV+ve)
Omeprazole	Esophagitis, GERD, ulcers: Start at 1mg/kg/d PO/IV once daily or divided 12hrly (max 20mg/d)
Oral Rehydration Solution (ORS)	Low Osmolarity formula for treatment of diarrhoea (see page 31 & 32)
Paracetamol	10-15mg / kg 6 to 8 hrly
Penicillin V	< 3 years: 125 mg twice daily > 3 years: 250mg twice daily
Pethidine, IM	0.5 to 1mg / kg every 4-6 hours
Phenobarbitone	Loading with 15mg/kg *(if NOT on maintenance phenobarb)* followed by 2.5mg - 5mg/kg daily, *Page 16*
Phenytoin	**Age 1m - 12 yrs** (IV, oral) 15-20 mg/kg at a rate not exceeding 1 mg/kg/minute as a loading dose; maintenance dose of 2.5 - 5 mg/kg twice daily (max.150mg twice daily) *Similar dosing can be used in neonates.*
Potassium	**Hypokalemia** oral 1 - 4 mmol/kg/day monitor serum potassium
Prednisolone	Asthma 1-2mg/kg PO daily (maximum doses see in Asthma page)

Doses (For overweight children, base dose calculation on median weight for age or height)

Proguanil
Malaria prophylaxis in sickle cell disease

<1 year: 25mg daily
>1 year up to 5 years: 50mg daily

Quinine — *Page 28 and 29*

Salbutamol

IV therapy should only be used on an HDU, ideally with a monitor, and MUST be given slowly as directed

IV in hospital only over 5 mins < 2 yrs 5 microgram/kg, ≥ 2 yrs up to 15 microgram/kg *max dose 250 micrograms (0.25mg)*

Nebulised: 2.5mg/dose as required refer to page 41

Inhaled *Acute exacerbation* 100 microgram per puff *see page 41*

TB Treatment — *See page 43*

Sodium Valproate

Neonate initially 20mg/kg once daily; maintenance 10 mg/kg twice daily PO
1 mo - 12yrs initially 10-15 mg/kg (max. 600mg) daily in 1-2 divided doses max 60 mg/kg daily. Maintenance 25-30 mg/kg daily in 2 divided doses PO

Vitamin A
Once on admission, not to be repeated within1 month. For malnutrition with eye disease repeat on day 2 and day 14

Age	Dosage Oral
< 6m	50,000 u stat
6 - 12m	100,000 u stat
> 12m	200,000 u stat

Vitamin D - *Chole or ergocalciferol: Rickets Low dose regimens daily for 8-12wks or one high dose. ± Calcium for first week of treatment.*

Age	Dosage
< 6m	3,000 u = 75 micrograms (PO)
> 6m	6,000 u = 150 micrograms (PO)
> 6m stat IM	300,000 u = 7.5 mg IM Stat

Vitamin D - *Maintenance*
After treatment course

Age	Dosage Oral
< 6m	200 - 400 u (5 - 10 µg)
6 - 12m	400 - 800 u (10 - 20 µg)

Vitamin K

Newborns: 1mg stat IM (<1500g, 0.5mg IM stat)
For liver disease: 0.3mg /kg stat, max 10mg

Zinc Sulphate
For Diarrhoea

Age ≤ 6 m: 10mg daily for 10-14 days
Age > 6 m: 20mg daily for 10-14 days

Emergency drugs – Diazepam, Lorazepam and Glucose

(Note: Diazepam is not used in neonates)

Weight (kg)	Diazepam (The whole syringe barrel of a 1ml or 2ml syringe should be inserted gently so that prdose is given at a depth of 4-5cm)				Glucose, 5mls/kg of 10% glucose over 5 - 10 minutes For neonates - 2 mls/kg	
	IV	IV	PR	PR	IV	
	Dose, 0.3mg/kg	mls of 10mg/2ml solution	Dose, 0.5mg/kg	mls of 10mg/2ml solution	Total Volume of 10% Glucose	To make 10% glucose
3.0	1.0	0.20	1.5	0.3	15	**50% Glucose and <u>water</u> for injection:** **10 mls syringe:** ✓ 2 mls 50% glucose ✓ 8 mls Water **20 mls syringe:** ✓ 4 mls 50% Glucose ✓ 16 mls Water
4.0	1.2	0.25	2.0	0.4	20	
5.0	1.5	0.30	2.5	0.5	25	
6.0	1.8	0.35	3.0	0.6	30	
7.0	2.1	0.40	3.5	0.7	35	
8.0	2.4	0.50	4.0	0.8	40	
9.0	2.7	0.55	4.5	0.9	45	
10.0	3.0	0.60	5.0	1.0	50	
11.0	3.3	0.65	5.5	1.1	55	
12.0	3.6	0.70	6.0	1.2	60	**50% Glucose and <u>5% Glucose</u>:** **10 mls syringe:** ✓ 1 mls 50% Glucose ✓ 9 mls 5% Glucose **20 mls syringe:** ✓ 2 mls 50% Glucose ✓ 18 mls 5% Glucose
13.0	3.9	0.80	6.5	1.3	65	
14.0	4.2	0.85	7.0	1.4	70	
15.0	4.5	0.90	7.5	1.5	75	
16.0	4.8	0.95	8.0	1.6	80	
17.0	5.1	1.00	8.5	1.7	85	
18.0	5.4	1.10	9.0	1.8	90	
19.0	5.7	1.15	9.5	1.9	95	
20.0	6.0	1.20	10.0	2.0	100	

Anticonvulsant drug doses and administration

Weight (kg)	**Phenobarb,** Loading dose, 15mg/kg *(use 20mg/kg for neonates)*	**Phenobarb,** maintenance, 5mg/kg daily *(high dose - chronic therapy)*		**Phenobarb** maintenance, 2.5mg/kg daily *(starting dose - fits in acute febrile illness)*		**Phenytoin,** loading dose, 15mg/kg *IV over 20 - 30 mins*	**Phenytoin,** maintenance, 5mg/kg daily
	IM / oral	**IM – mg**	**oral - tabs**	**IM / oral**		**IV / oral**	**IV / oral**
2.0	30	10	-	5	-	*Tablets may be crushed and put down ng tube if required.*	
2.5	37.5	12.5		6.25			
3.0	45	15	½ tab	7.5		45	15
4.0	60	20		10		60	20
5.0	75	25		12.5	½ tab	75	25
6.0	90	30	1 tab	15		90	30
7.0	105	35		17.5		105	35
8.0	120	40		20	1 tab	120	40
9.0	135	45	1½ tab	22.5		135	45
10.0	150	50		25		150	50
11.0	165	55		27.5		165	55
12.0	180	60	2 tabs	30		180	60
13.0	195	65		32.5	1½ tab	195	65
14.0	210	70		35		210	70
15.0	225	75	2½ tab	37.5		225	75
16.0	240	80		40		240	80
17.0	255	85		42.5		255	85
18.0	270	90	3 tabs	45		270	90
19.0	285	95		47.5	2 tabs	285	95
20.0	300	100		50		300	100

Intravenous/intramuscular antibiotic doses

(for age ≥ 7 days, neonatal doses: page 50)

Weight *(kg)*	**Penicillin*** (50,000 iu/kg)	**Flucloxacillin** (50mg/kg)	**Gentamicin** (7.5mg/kg)	**Ceftriaxone IV/ IM** Max 50mg/kg 24hrly for neonates** *Meningitis/ Very Severe Sepsis, 50mg/kg BD* not to exceed 4 g/day	**Metronidazole** (7.5mg/kg) **IV** not to exceed 4 g/day
	IV / IM	**IV / IM**	**IV / IM**		**Age < 1m:** 12 hrly **Age ≥ 1m:** 8 hrly
	6 hrly	**8 hrly**	**24 hrly**	**50mg/kg**	
3.0	150,000	150	20	150	20
4.0	200,000	200	30	200	30
5.0	250,000	250	35	250	35
6.0	300,000	300	45	300	45
7.0	350,000	350	50	350	50
8.0	400,000	400	60	400	60
9.0	450,000	450	65	450	65
10.0	500,000	500	75	500	75
11.0	550,000	550	80	550	80
12.0	600,000	600	90	600	90
13.0	650,000	650	95	650	95
14.0	700,000	700	105	700	105
15.0	750,000	750	110	750	110
16.0	800,000	800	120	800	120
17.0	850,000	850	125	850	125
18.0	900,000	900	135	900	135
19.0	950,000	950	140	950	140
20.0	1,000,000	1000	150	1000	150

***Not recommended if jaundiced or age ≤ 6 days*

Oral antibiotic doses

(for neonatal doses see page 50)

Weight (kg)	High dose Amoxicillin *for pneumonia & severe infections* 40-45mg/kg/dose 12 hrly			Amoxicillin 12 hrly (for mild infections) 25mg/kg/dose		Flucloxacillin 15mg/kg/dose 8 hrly		Ciprofloxacin 15mg/kg/dose (for 3 days) 12 hrly	Metronidazole 7.5mg/kg/dose 8 hrly
	Syrup		D. Tab	mls	250mg	mls	250mg	250mg	200mg
	125mg / 5mls	250mg 5mls	250mg tabs	125mg/5ml	tabs	125mg/5ml	caps or tabs	tabs	tabs
3.0	5mls	2.5	1/2 tab	4		2.5	1/4		
4.0	7.5mls	3.75		4		2.5	1/4	1/4	
5.0	10mls	5	1 tab	6		5	1/4	1/4	1/4
6.0	10mls	5		6		5	1/2	1/4	1/4
7.0		7.5		8		5	1/2	1/2	1/2
8.0		7.5		8		5	1/2	1/2	1/2
9.0		7.5		8		5	1/2	1/2	1/2
10.0		10	2 tabs	12	1	5	1	1/2	1/2
11.0		10		12	1	10	1	1	1/2
12.0		10		12	1	10	1	1	1/2
13.0		12.5		12	1	10	1	1	1/2
14.0		12.5	3 tabs	12	1	10	1	1	1
15.0		12.5		15	1	10	1	1	1
16.0				15	1	10	1	1	1
17.0				15	1	10	1	1	1
18.0				15	1	10	1	1	1
19.0				15	1	10	1	1	1
20.0				15	2	10	1	1	1

Initial Maintenance Fluids/Feeds

(Normal Renal function)

Note:

- **Oral Feeding** should start as soon as safe and infants may rapidly increase to 150mls/kg/day of feeds as tolerated *(50% more than in the chart)*
- Add 50mls 50% dextrose to 450mls Ringer's Lactate to make Ringer's/5% dextrose for maintenance fluid
- Drip rates are in drops per minute

Weight (kg)	**Volume in 24hrs**	**Rate** (mls/hr)	**Drip rate adult IV set** *(20 drops=1ml)*	**Drip rate paediatric burette** *(60 drops=1ml)*	**3hrly bolus feed volume**
3	300	13	4	13	40
4	400	17	6	17	50
5	500	21	7	21	60
6	600	25	8	25	75
7	700	29	10	29	90
8	800	33	11	33	100
9	900	38	13	38	110
10	1000	42	14	42	125
11	1050	44	15	44	130
12	1100	46	15	46	140
13	1150	48	16	48	140
14	1200	50	17	50	150
15	1250	52	17	52	150
16	1300	54	18	54	160
17	1350	56	19	56	160
18	1400	58	19	58	175
19	1450	60	20	60	175
20	1500	63	21	63	185
21	1525	64	21	64	185
22	1550	65	22	65	185
23	1575	66	22	66	185
24	1600	67	22	67	200
25	1625	68	23	68	200

Triage of sick children

Emergency Signs *If history of trauma ensure cervical spine is protected*

No emergency signs

Airway & Breathing

- Obstructed breathing
  - Central cyanosis
  - Severe respiratory distress
  - Weak / absent breathing

Circulation

- Cold hands with **ANY** of:
  - Capillary refill > 3 secs
  - Weak + fast pulse
  - Slow (<60 bpm) or absent pulse

→ Immediate transfer to emergency area:
- Start life support procedures,
- Give oxygen,
- Weigh if possible.

Coma / convulsing / confusion : AVPU = 'P or U'

Diarrhoea with sunken eyes with return of skin pinch 2 secs

→
- Immediate transfer to emergency area
- Assess/treat for severe dehydration

Priority Signs

No priority signs

- **T**iny - Sick infant aged < 2 months
- **T**emperature - very high > 39.5°C
- **T**rauma - major trauma
- **P**ain - child in severe pain
- **P**oisoning - mother reports poisoning
- **P**allor - severe palmar pallor
- **R**estless / Irritable / Floppy
- **R**espiratory distress
- **R**eferral - has an urgent referral letter
- **M**alnutrition - visible severe wasting
- **O**edema of both feet
- **B**urns - severe burns

→ Front of the Queue:
- Clinical review as soon as possible
- Weigh
- Baseline observations

Non-urgent *(children with none of these signs)*

Ensure Safety, Stimulate, Shout for HELP! Change Setting to emergency area

1) Assess and clear airway
2) Open airway to sniffing position using head tilt - chin lift maneuver
If history of trauma, ensure cervical spine is protected and use jaw thrust to open airway

Assess breathing - *look, listen, feel for 5 seconds*

No breathing

Give 5 rescue breaths with BVM connected to 100% oxygen- if chest doesn't rise, check if airway is open & the position of the mask

Ensure at least 2 good breaths

Support airway
Continue oxygen

Adequate breathing

Check for large pulse and for signs of life for 5-10 secs

No pulse or weak, slow pulse

Give 15 chest compressions then continue giving 15 chest compressions for each 2 breaths for 2 minutes.

pulse palpable and > 60bpm

1) Continue ventilation *(rate 20 breaths per minute, give oxygen),*
2) Look for signs of dehydration or poor circulation and give emergency fluids as necessary,
3) Consider treating hypoglycaemia,
4) Continue full examination to establish cause of illness and treat appropriately

Reassess every 1-2 mins
1. Give 0xygen via NRM at 10-15L/min and titrate flow depending on oxygen saturation; target SpO2 94-98%
2. Monitor vital signs every 15mins
3. Take history and full examination, and decide on admission care

Re-assess ABC

pulse palpable and >60bpm

No change

1) Continue 15 chest compressions for every 2 breaths for 2 minutes
2) Reassess ABC

pulse palpable and >60bpm

No change

1) Consider iv 0.1ml/kg 1 in 10,000 adrenaline if 3 people in team,
2) Consider fluid bolus if shock likely and treatment of hypoglycaemia
3) Continue CPR in cycles of 2 - 3 minutes
4) Reassess every 2 - 3 minutes.

Pulse palpable and > 60bpm

Infant/Child WITH SIGNS OF LIFE

(without trauma ssessment prior to a full history and examination)

Obs	**Safe** ▪ Stimulate - **if not Alert** ▪ Shout for Help - **if not Alert** ▪ Setting for further evaluation **(If not alert AVPU <A)**	▪ Check eye contact / movements ▪ Shout for help unless obviously alert ▪ **If not Alert** place on resuscitation couch ▪ **If alert,** it may be appropriate to continue evaluation while child is with parent
A	▪ Assess for obstruction by listening for stridor / airway noises. ▪ Look in the mouth **if not alert** ▪ Position - **if not alert, to a sniffing position**	▪ Suction (to where you can see) if indicated (not in an alert child) ▪ Position only if not alert and placed on couch ▪ Use Oropharyngeal airway only if unconscious without a gag reflex
B	Assess adequacy of breathing ▪ **Respiratory rate for 1 min (very fast)?** ▪ **Head nodding?** ▪ Nasal flaring ▪ **Central cyanosis?** ▪ **Grunting?** ▪ **Lower chest wall indrawing?** ▪ Deep / Acidotic breathing? ▪ **Check oxygen saturation (SPO2<90%)?** ▪ Listen for wheeze or crackles	**Decide:** **Is there a need for oxygen?** ▪ If any of the bolded signs present, start oxygen via nasal prongs and titrate based on SpO2 to target 90-95%. **Is there a need for immediate bronchodilator?** • If wheeze present, give bronchodilators
C	Assess adequacy of circulation ▪ Large pulse - very fast or very slow? ▪ **Temperature gradient?** ▪ **Capillary refill time?** ▪ **Peripheral pulse -present / weak (Note initial response to stimulation/alertness)** ▪ Check for signs of severe pallor ***If signs of poor circulation*** ▪ Check for severe dehydration ▪ Check for severe pallor ▪ Check for severe wasting/ bilateral oedema/ MUAC	**Decide:** – Does this child have severely impaired circulation **AND** diarrhea with sunken eyes / prolonged skin pinch (hypovolemic shock)? **If yes** give 20mls/kg Ringer's Lactate **over 15 mins** as rapid bolus and progress to Plan C Step 2 fluids for diarrhea/dehydration – If there is severely impaired circulation BUT no diarrhea, no dehydration, no severe acute malnutrition and no severe anaemia, give 20mls /kg of Ringer's Lactate over 2 hours in 5-10ml/kg aliquots – If severely impaired circulation **with** severe acute malnutrition, give 20mls /kg of Ringer's Lactate/5% dextrose over 2 hours. – **If there is respiratory distress and circulatory compromise with severe pallor,** organise immediate transfusion. As you await blood, give maintenance fluids/feeds ONLY (check page 14) – If impaired circulation (some but not all of the bolded signs) BUT no diarrhea, no severe anaemia, with or without severe acute malnutrition, give maintenance fluids/feeds only. DO NOT BOLUS!
D	▪ Assess AVPU ▪ Check glucose at bedside	**Decide:** **If child alert, assess ability to drink** **Does this child need 10% dextrose?** If hypoglycemic or AVPU< A and unable to check glucose administer 10%D at 5mls/kg

Actions after ABCD:
- Take full history and examination
- Document all interventions given and the time they were done
- Continue observing patient as clerkship continues

Oxygen Therapy

Hypoxemia is often present in sick children and is a major risk factor for death regardless of the diagnosis

Indications for oxygen therapy:

- Oxygen saturation (SpO2) <90% measured using pulse oximeter
- Convulsions
- Post-resuscitation
- Physical signs that indicate absolute need for oxygen include:
  - *Central cyanosis*
  - *Head nodding*
  - *Nasal flaring*
  - *Grunting*
  - *Severe lower chest wall indrawing*
  - *Respiratory rate >70 bpm*
  - *AVPU<A and inability to drink or breastfeed plus respiratory distress*

Administration of oxygen

1. Start giving oxygen at accurate and safe levels & titrate every 15-30mins by 0.5L/min until the target saturation of 91-95% for neonates and 90-95% for older children. For children, the target saturation is 94-98%.

2. Change the oxygen delivery methods (nasal prongs, catheter or NRM) and flow rates to achieve target saturations.

3. If target saturations are not being achieved with the highest flow rate, refer the patient for advanced care (high flow nasal cannula, CPAP or mechanical ventilation).

4. Once target saturations are achieved, maintain the oxygen flow rate and FiO2 and monitor the SpO2 and the work of breathing.

5. If the child remains stable (SpO2 >90%, no increased WoB and no emergency signs), start weaning off oxygen by 0.5L/min every 15-30mins while monitoring the SpO2 and work of breathing to assess whether supplemental oxygen is still required.

6. Once oxygen is stopped, recheck SpO2 after 1h, as late desaturation can sometimes occur

7. Discharge only if child has been stable with SpO2 ≥ 90% and no increased WoB on room air for at least 24hrs

Prescribing Oxygen

Oxygen Administration Device.	Flow rate	Fraction of inspired Oxygen (FiO2)
Nasal prong *(Preferred method of delivering oxygen to infants and children < 5 years of age).*	Standard Flow Rate: **Neonates:** 0.5 - 1 L/min **Infants:** 1 - 2 L/min **Child:** 1 - 4 L/min	Delivers **35%** O2 to the patient.
	High Flow rate **Preterm Neonates:** 1 L/min **Term neonates:** 2 L/min **Infants/child:** 4- 8L/min	Delivers **50%** O2 to patient
Nasal catheter	**Neonates:** Not recommended **Infants/child:** 1- 2L/min	Delivers **40%** O2 to patient
Oxygen face mask with reservoir bag (non-rebreather mask)	**All groups:** 10-15L/min (The bag should not deflate so as not to dilute the O2 concentration)	Delivers **80-95%** O2 to patient

**Humidification is needed for all patients on high flow rates*

*Check for abdominal distension regularly.

Always DOCUMENT the flow rate, delivery device, monitoring frequency and target oxygen saturation as part of the oxygen prescription

Use of Intra-osseous lines

If IV access fails, IO line is a rapid, safe & reliable route for obtaining blood samples and administration of drugs, fluids & blood.

- ✓ Use IO or bone marrow needle 15 - 18G if available or 16 - 21G hypodermic needle if not available
- ✓ Clean after identifying landmarks then use sterile gloves and sterilize site
- ✓ **Site** - Middle of the antero-medial (flat) surface of tibia at junction of upper and middle thirds
  - bevel to toes and introduce vertically (90^{0})
  - advance slowly with rotating movement
- ✓ **Stop** advancing when there is a '*sudden give*' - then aspirate with 5 mls syringe
- ✓ Slowly inject 3mls Normal Saline looking for any leakage under the skin - if OK attach IV fluid giving set and apply dressings and strap down
- ✓ Give fluids as needed - a 20 mls / 50 mls syringe will be needed for boluses
- ✓ Watch for leg / calf muscle swelling
- ✓ Replace IO access with IV within 8 hours

Treatment of convulsions

Age > 1 month.

For convulsions in the first month, refer to page 58

Child convulsing? →

Ensure safety and check ABCD
A - Place in lateral position, suction if indicated
B - Start on oxygen via NRM
C - Check for temp gradient, severe pallor
D - Check RBS or give 5mls/kg of 10% Dextrose

↓

Convulsion lasting > 5min?

↓ *Yes*

- **Give IV Diazepam 0.3mg/kg** slowly over 1minute OR rectal diazepam 0.5mg/kg
  Alternatives include IV Lorazepam or buccal midazolam (dosages in the formulary)
  Check ABCD when convulsion stops, observe and investigate cause

↓ **Convulsion continues 5mins after first dose of diazepam**

- **Give the second dose of IV diazepam 0.3 mg/kg slowly over 1 minute, OR rectal diazepam 0.5 mg/kg**
- Continue oxygen
- Check airway and breathing when convulsion stops, Investigate & treat cause

↓ **Convulsion continues 5mins after second dose of diazepam**

- **Give IM phenobarbitone 15mg/kg (loading dose)**
- Initiate maintenance therapy with phenobarbitone 2.5 mg/kg OD for 48 hrs then review
- Continue oxygen during active seizure
- Check ABC when convulsion stops
- Investigate cause

↓ *No*

Child having 3rd convulsion lasting <5 mins in <2 hrs (short multiple convulsions).

(If children have up to 2 fits lasting <5mins, they DO NOT require emergency drug treatment?)

↓

- **Give IM phenobarbitone 15mg/kg (loading dose)**
- Initiate maintenance therapy with phenobarbitone 2.5 mg/kg OD for 48 hrs then review
- Continue oxygen during active seizure
- Check ABC when convulsion stops
- Investigate cause

- DO NOT give more than 2 doses of diazepam in 24hrs once phenobarbitone is used
- DO NOT give a phenobarbitone-loading dose to an epileptic on maintenance phenobarbitone
- Phenytoin and levetiracetam (see doses in the formulary) are alternatives to phenobarbitone

If a high quality blood slide is negative with signs of **SEVERE** malaria, start treatment **BUT REPEAT** 24 hourly up to 3 times and **STOP** treatment if 3rd test is negative

SEVERE MALARIA
Fever **plus** any of:
- AVPU = 'V', 'P', 'U' or,
- Unable to drink or,
- Respiratory distress with severe anaemia or, acidotic breathing or,
- Hypoglycaemia (glucose ≤ 2.5 mmols/L) or,
- > 2 convulsions

Yes →

Treat with Artesunate
(or quinine if artesunate is not available)
1) Check dosage charts
give loading dose if using quinine
2) Treat hypoglycaemia
3) Maintenance fluids / feeds
4) **DO NOT** give bolus iv fluids unless diarrhoea with signs of shock
5) If respiratory distress or cardiac failure & Hb < 5 g/dL, transfuse 10 mls/kg packed cells (or 20 mls/kg whole blood) **urgently**

No ↓

Severe anaemia, Hb ≤5g/L or HCT ≤15%, alert (AVPU = 'A'), able to drink and breathing comfortably.

Yes →

Treatment:
- AL *(or oral second line if not available)*
- Iron and
- If Hb < 4 g/dL; Transfuse 10 mls/kg packed cells or 20mls/kg whole blood **over 4 hours**

No ↓

Fever, none of the severe signs above, able to drink / feed, AVPU = 'A'

↓

Conduct reliable malaria test (BS or RDT)

Test positive →

Treat with AL*(or oral second line if 1st line is not available*

Test negative ↓

Antimalarial **NOT** required, look for another cause or illness. **Repeat test** if concerns remain.

→ If Hb < 9 g/dL, treat with oral iron for 14 days initially. If respiratory distress develops, and Hb < 5g/dL, transfuse urgently.

Treatment failure:

1. Consider other causes of illness / co-morbidity
2. A child on oral antimalarials who develops signs of severe malaria (Unable to sit or drink, AVPU=V,U or P and / or respiratory distress) at any stage should be changed to iv artesunate (or quinine if not available).
3. If a child on oral antimalarials has fever and a positive blood slide after 3 days (72 hours) then check compliance with therapy and if treatment failure proceed to second line treatment

Artesunate

Artesunate typically comes as a powder together with a 1ml vial of 5% bicarbonate that then needs to be further diluted with either normal saline or 5% dextrose - the amount to use depends on whether the drug is to be given iv or im (*see table below)*

- ***DO NOT*** use water for injection to prepare artesunate for injection
- ***DO NOT*** give artesunate if the solution in the syringe is cloudy
- ***DO NOT*** give artesunate as a slow iv drip (infusion)
- ***YOU MUST*** use artesunate ***within 1 hour*** after it is prepared for injection

Preparing IV / IM Artesunate	**IV**	**IM**
Artesunate powder (*mg*)	60mg	60mg
Sodium Bicarbonate (*mls,5%*)	1ml	1ml
Normal Saline or 5% Dextrose (*mls*)	5 mls	2mls
Artesunate concentration (*mg/ml*)	10mg/ml	20mg/ml

Quinine

For **IV infusion** typically 5% or 10% dextrose is used.

- Use at least 1ml fluid for each 1mg of quinine to be given
- ***DO NOT*** infuse quinine at a rate of more than 5mg/kg/hour
  - Use 5% Dextrose or normal saline for infusion with 1 ml of fluid for each 1mg of quinine.
  - The 20mg/kg loading dose therefore takes 4 hours or longer
  - The 10mg/kg maintenance dose therefore takes 2 hours or longer

For **im Quinine:**

- Take 1ml of the 2mls in a 600mg Quinine suphate iv vial and add 5mls water for injection - this makes a 50mg/ml solution.
- For a loading dose this will mean giving 0.4mls/kg
- For the maintenance dosing this will mean giving 0.2mls/kg
- If you need to give more than 3mls (a child over 8 kg for a loading dose or over 15kg for maintenance doses then give the dose into two im sites - ***do not give more than 3mls*** per injection site.

** *For oral Quinine 200 mg Quinine Sulphate = 200mg Quinine Hydrochloride or Dihydrochloride but = 300mg Quinine Bisulphate. The table of doses below is ONLY correct for a 200mg Quinine Sulphate tablet.*

Malaria treatment doses

- ***Artesunate*** is given IV / IM for a minimum of 24 hours.
- **After the third injection of artesunate and** the child can eat/drink then change to a **full course** of **artesinin combination therapy** (ACT) 8-12 hours after the last dose of artesunate *(typically the 1st line oral anti-malarial, Artemether Lumefantrine)*

Weight ≤ 20Kg at 3mg/kg/dose and >20Kg at 2.4mg/kg/dose of Artesunate

Weight (kg)	Artesunate, 3mg/kg *At 0,12 and 24h then daily for max 7 days*			Quinine, loading 20mg/kg then 10mg/kg		Quinine (10mg/kg) 200mg tabs Quinine sulphate** 8 hourly
	IV mls of 60mg in 6mls	Dose in mg	im mls of 60mg in 3mls	IV infusion / IM		
				Loading	8 hrly	
3.0	0.9	9	0.45	60	30	1/4
4.0	1.2	12	0.6	80	40	1/4
5.0	1.5	15	0.8	100	50	1/4
6.0	1.8	18	0.9	120	60	1/2
7.0	2.1	21	1.1	140	70	1/2
8.0	2.4	24	1.2	160	80	1/2
9.0	2.7	27	1.4	180	90	1/2
10.0	3	30	1.5	200	100	3/4
11.0	3.3	33	1.6	220	110	3/4
12.0	3.6	36	1.8	240	120	3/4
13.0	3.9	39	12	260	130	3/4
14.0	4.2	42	2.1	280	140	3/4
15.0	4.5	45	2.3	300	150	1
16.0	4.8	48	2.4	320	160	1
17.0	5.1	51	2.6	340	170	1
18.0	5.4	54	2.7	360	180	1
19.0	5.7	57	2.9	380	190	1 1/4
20.0	6.0	60	3	400	200	1 1/4

Artemether *(20mg)* **+ Lumefantrine** *(120mg)*
Give with food
Start then at 8h then BD on day 2 and 3

Weight	Age	Dose
< 5 kg	-	1/2 tablet
5 - 15 kg	3 - 35 mo	1 tablet
15 - 24 kg	3 - 7 yrs	2 tablets
25 - 34 kg	9 - 11 yrs	3 tablets

Dihydroartemisinin + Piperaquine (2nd Line)
OD for 3 days

Age	Dose
3 - 35 mo	1 paed tab
3 - 5 yrs	2 paed tabs
6 - 11 yrs	1 adult tab

Investigation

Age ≥ 60 days and history of fever

Yes

One of:
- Coma, inability to drink / feed,
- AVPU = 'P or U'.
- Stiff neck,
- Bulging fontanelle,
- Fits if age <6 months or >6 yrs
- Evidence of partial seizures

Yes →

LP **MUST** be done
Immediate LP to view by eye +/- laboratory examination even if malaria slide positive **unless**:
- Child requires CPR,
- Pupils respond poorly to light
- Skin infection at LP site.

No

- Agitation / irritability
- Any convulsions

Yes →

Do an LP unless completely normal mental state after febrile convulsion. Review within 8 hours and repeat LP if doubt persists.

No

Meningitis unlikely, investigate other causes of fever

Treatment

Interpretation of LP and treatment definitions:
Either Bedside examination:
- Looks cloudy in bottle (turbid) and not a blood stained tap,

And / or Laboratory examination with one or more of (*if possible*):
- White cell count > 10 x 10^6/L
- Gram positive diplococci or Gram negative cocco-bacilli

No to all

Yes to one →

Classify **DEFINITE** meningitis:
1) Ceftriaxone
Steroids are not indicated

One of:
- Coma,
- Stiff neck,
- Bulging fontanelle,

+ LP looks clear

No to all

Yes to one →

Classify **PROBABLE** meningitis:
1) Ceftriaxone
Change treatment based on CSF results
Steroids are not indicated.

CSF Wbc + Gram stain result

All normal

Test not done →

Classify **POSSIBLE** meningitis:
1) Ceftriaxone
Senior review.

No meningitis

Diarrhoea / Gastroenteritis

Age ≥ 1 month (excluding severe malnutrition)

History of diarrhoea / vomiting, age ≥ 1 month

Yes

Hypovolaemic shock from diarrhoea / dehydration

All four of

- Weak/absent pulse;
- AVPU < A;
- Cold hands + Temp gradient;
- Capillary refill > 3 secs **PLUS** sunken eyes and slow skin pinch

Yes

IV/IO Ringer's lactate 20mls/kg

A second bolus may be given if still in shock before **proceeding to step 2 of Plan C** (*see below*)

Treat for Hypoglycaemia

NB:If Hb <5g/dl,severe pallor transfuse urgently **BUT** do not give bolus

No

Plan C Step 1

IV Ringer's Lactate 30mls/kg

- over 30 mins if age ≥ 12m OR
- over 60min if age < 12m

SEVERE Dehydration

Unable to drink or AVPU < A plus, any of the following:

- sunken eyes
- return of skin pinch ≥ 2 secs

OR

Plan C Step 2

IV Ringer's Lactate 70mls

- over 2.5 hrs if age ≥ 12m OR
- over 5 hrs if age < 12m

Give ORS at 5 mls/kg/hr via NGT

If not able to start IV, give NGT ORS 120mls/kg over 6 hrs

No

Re-assess at least hourly and after 3-6 hrs reclassify as severe some or no dehydration and treat accordingly

SOME Dehydration

Able to drink adequately but with **2 or more** of:

- Sunken eyes
- Skin pinch 1 - 2 secs
- Restlessness / irritability

Yes

Plan B

- ORS by mouth at 75 mls/kg over 4 hrs
- Continue breast feeding as tolerated

Reassess after 4 hrs reclassify and treat accordingly

No

NO Dehydration

Diarrhoea but not enough signs to classify as some dehydration

Yes

Plan A

- 10mls/kg ORS after each loose stool
- Continue breast feeding
- Encourage feeding if > 6 months

All cases to receive Zinc. Antimicrobials are NOT indicated unless there is dysentery or proven amoebiasis or giardiasis.

Dehydration management

(child WITHOUT severe malnutrition/severe anaemia)*

Weight (kg)	Shock, 20mls/kg Ringer's Immediately	Plan C – Step 1	Plan C – Step 2			Plan B - 75mls/kg
		30mls/kg Ringer's	**70mls/kg** Ringer's or NG ORS			Oral / ORS
		Age <12m, 1 hour **Age ≥1yr,** ½ hour	**Age <12m,** over 5 hrs = drops/min**	**Volume**	**Age ≥ 1yr,** over 2½ hrs = drops/min**	*Over 4 hours*
2.00	40	**50**	*10*	**150**	** *Assumes 'adult' IV giving sets where 20 drops=1ml*	**150**
2.50	50	**75**	*13*	**200**		**150**
3.00	60	**100**	*13*	**200**		**200**
4.00	80	**100**	*20*	**300**		**300**
5.00	100	**150**	*27*	**400**	*55*	**350**
6.00	120	**150**	*27*	**400**	*55*	**450**
7.00	140	**200**	*33*	**500**	*66*	**500**
8.00	160	**250**	*33*	**500**	*66*	**600**
9.00	180	**250**	*40*	**600**	*80*	**650**
10.00	200	**300**	*50*	**700**	*100*	**750**
11.00	220	**300**	*55*	**800**	*110*	**800**
12.00	240	**350**	*55*	**800**	*110*	**900**
13.00	260	**400**	*60*	**900**	*120*	**950**
14.00	280	**400**	*66*	**1000**	*135*	**1000**
15.00	300	**450**	*66*	**1000**	*135*	**1100**
16.00	320	**500**	*75*	**1100**	*150*	**1200**
17.00	340	**500**	*80*	**1200**	*160*	**1300**
18.00	360	**550**	*80*	**1200**	*160*	**1300**
19.00	380	**550**	*90*	**1300**	*180*	**1400**
20.00	400	**600**	*95*	**1400**	*190*	**1500**

**Consider immediate blood transfusion if severe pallor or Hb<5g/dl on admission*

Diabetic Ketoacidosis Management

Initial Management

Presentation

History:	Clinical signs:	Biochemical features:
Polyuria, Polydipsia, Enuresis, Weight loss, Nausea, Vomiting, Abdominal pain, Reduced level of consciousness	Dehydration, Deep sighing respiration (Kussmaul), Fruity breath, Lethargy/drowsiness	• Blood glucose >11mmol/l • pH <7.3 • Bicarbonate <15mmol/l • Ketones in urine

Diagnosis of Diabetic Ketoacidosis confirmed

• Assess severity & amp; level of dehydration. Fix 2 IV lines & amp; draw samples for electrolytes and other investigations as required
• Senior review

Initial Management

SHOCK:
• AVPU <A
• Weak/absent peripheral pulses
• Prolonged CRT
• Cold extremities

• Airway +/- NG tube
• Breathing - Give Oxygen via non-rebreather mask
• Circulation - 0.9% Normal Saline 10 - 20mls/kg over 15mins

Severe (pH <7.1, HCO3 <5mmol/L) | Moderate (pH <7.2, HCO3 <10mmol/L)

Severe/some dehydration, Acidotic breathing or vomiting

Resuscitation fluid:

0.9% Normal Saline 10mls/kg over 1 hour

Mild (pH <7.2, HCO3 <15mmol/L)

Clinically well and tolerating fluids

• Start subcutaneous insulin
• Oral rehydration

NO IMPROVEMENT AFTER 6 HOURS

- NPO
- Calculate fluid requirements over 48hr

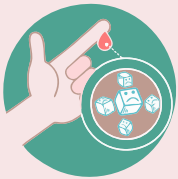
Fluid requirement=maintenance fluid x2 + fluid deficit resuscitation fluid given for severe/moderate (DO NOT DEDUCT FLUID GIVEN FOR SHOCK!)

*Maintenance fluid calculation over 24hrs:
• 100mls/kg for the first 10kg
• 50mls/kg for the next 10kg
• 25mls/kg for additional kg

**Fluid deficit (assume 10% dehydration) = 100mls/kg

AFTER FIRST HOUR of fluids:

• Start regular insulin 0.05 – 0.1IU/kg/hr by infusion
• Check potassium and add 20mmol of potassium per 500ml of fluid unless patient is anuric.



Care continues on the next page

Critical observations:

- **Hourly** fluid input and output
- **Hourly** blood glucose
- Neurological status at least **hourly**
- Electrolytes and BGA 2 - 4 **hourly** after starting IV fluid therapy
- Monitor ECG for T-wave change sessions as required
- Senior review

ACIDOSIS

* If blood glucose ≤17mmol/l or blood glucose falls >5mmol/L/hr change to 5% dextrose in 0.9% saline.
** If blood glucose ≤10mmol/L, change to 10% dextrose in 0.9% saline

Resolution of DKA:
- Clinically well, drinking well, tolerating food
- pH >7.3
- Serum ketones <1.0

- Start subcutaneous insulin
- Stop intravenous insulin after an appropriate interval

NO IMPROVEMENT AFTER 6 HOURS

Re-evaluate:

Fluid balance + IV therapy, ketones
- May require further resuscitation fluid
- Check insulin dose correct
- Consider sepsis

Check if the inslun is corrct

* To make 5% dextrose in 0.9% saline, add 50ml of 50% dextrose to 450mls
** 0.9% saline.
To make 10% dextrose in 0.9% saline, add 100ml of 50% dextrose to 400mls 0.9% saline
Do not correct acidosis in DKA with bicarbonate
If febrile, start antibiotics

NEUROLOGICAL DETERIORATION

Warning signs:
- Headache
- Irritability
- Incontinence
- Slowing heart rate
- Reduced consciousness level
- Specific neurological signs

- Exclude hypoglycemia
- Is it Cerebral Oedema?

If yes

Management of Cerebral Oedema:

- Call Senior staff
- Prop head of bed at 30°
- Give oxygen
- Give Mannitol 2.5/kg OR 3% hypertonic saline 5ml/kg
- Restrict IV fluids by ½
- Move to ICU/PICU
- Cranial imaging when stabilised

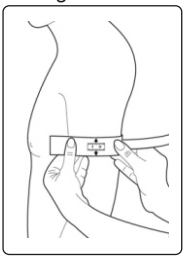
ISPAD Clinical Practice Consensus Guidelines 2018: Diabetic ketoacidosis and hyperglycemic osmolar state

Measuring nutritional status

Anthropometric measurements assess the nutrition status of a child to determine if there is wasting or stunting. MUAC is a simple and quick method to detect wasting. Weight and Height/Length measurements can be useful to detect wasting, stunting and for growth monitoring over time.

Mid upper arm circumference (MUAC)

MUAC is measured using a tape around the left upper arm. MUAC is used to quickly assess the nutritional status in emergency settings.



Weight, Height and Age

- ***Weight for height (W/H) :*** Measure length lying if aged <2 yr to give weight for length. Low W/H (or W/L) = wasting, and indicates acute malnutrition.
- ***Weight for age (W/A):*** Low W/A does not distinguish acute from chronic malnutrition. W/A is thus **not used** for diagnosis of acute malnutrition, but can be used to monitor growth e.g. in the MCH booklet

In the diagnosis of acute malnutrition, we use W/H ***expressed as Z scores***. Z - scores can be obtained from simple tables *(pg 55 & 56)*

Visible Severe Wasting tends to identify only severest cases of SAM. It is better to use MUAC or WHZ score.

Kwashiorkor = severe malnutrition *(at any age)*

Classifying malnutrition
(for WHZ values see pg 53 to 54)

Acute Malnutrition *(severity)*	MUAC *(cm)*	WHZ
None	>13.5	> - 1
At Risk	12.5 to 13.4	> - 2 to ≤ 1
Moderate	11.5 to 12.4	> - 3 to ≤ - 2
Severe	< 11.5	≤ - 3
	Kwashiorkor	

Exclude other medical conditions that can lead to wasting e.g CVS, GIT, endocrine

Fluid management

in severe malnutrition with diarrhoea

Shock: AVPU<A, plus absent or weak pulse plus prolonged capillary refilling (>3s) plus cold periphery with temperature gradient - Give 20 mls/kg in 2 hrs of Ringer's lactate with 5% dextrose (to make this solution, add 50 mls 50% dextrose to 450 mls Ringer's Lactate)

If severe anaemia start urgent blood transfusion not Ringer's.

If not in shock or after treating shock

- If unable to give oral / ngt fluid because of very poor medical condition use / continue with iv fluids at maintenance regimen of 4mls/kg/hr
- **If able to introduce oral or ng fluids / feeds:**
  - **For 2 hours:** Give ReSoMal at 10mls/kg/hour
  - **Then:** Give ReSoMal at 7.5ml/kg over 1 hour then introduce first feed with F75 and alternate ReSoMal with F75 each hour at 7.5mls/kg/hr for 10 hours - can increase or decrease hourly fluid as tolerated between 5-10 mls/kg/hr.
- At 12 hours switch to 3 hourly oral / NG feeds with F75 (*next page*)

Weight (kg)	**Fluids for shock complicating malnutrition**		**Oral / NG** ***first 12 hours***	**Maintenance**
	20mls/kg over 2 hrs		7.5mls/kg/hr	4mls/kg/hr
	Ringer's in 5% Dextrose		ReSoMal*/ F75 *(*10mls/kg first 2hrs)*	Ringer's in 5% Dextrose
	IV		**Oral / NG**	**IV**
	Shock (*over 2hrs)*	**Drops/min** *adult iv set (20 drops = 1ml)*	**7.5mls/kg/hr** for up to 10 hours	mls/ hour
4.00	80	*14*	30	15
5.00	100	*17*	37	20
6.00	120	*20*	45	25
7.00	140	*24*	52	30
8.00	160	*27*	60	30
9.00	180	*30*	67	35
10.00	200	*34*	75	40
11.00	220	*37*	82	44
12.00	240	*40*	90	46
13.00	260	*44*	97	48
14.00	280	*47*	115	50
15.00	300	*50*	122	52

Complicated severe acute malnutrition

age 6 - 59 months

Check using ABC approach and admit if acute illness ***and either*** of:

- MUAC < 11.5 cm (*or visible severe wasting if no MUAC*) with WHZ < 3 used if child aged < 6 months
- Oedema / other signs of Kwashiokor (*flaky pale skin/hair changes)*

Step 1

- Check blood glucose and treat if < 3 mmol/l (*5mls/kg10% dextrose* If glucose test unavailable treat for hypoglycaemia *if not alert*
- Oral / NG glucose or feeds should as soon as possible (*not > 30 mins after admission)*

Step 2

- Check for hypothermia, axillary temperature < 35^{0}C.
- If present warm with blankets, warm bags of fluid or a heater.

Step 3

- Check for dehydration if has diarrhoea. If in shock, use IV fluids if not in shock use ReSoMal (see page 36)
- Transfuse *if Hb <4 g/dL*, 10mls/kg whole blood in 3hrs + frusemide 1mg/kg (*for shock see previous page)*

Step 4

Electrolyte imbalance. **Use commercial F75**. *If not available* mineral mix and 4 mmol/kg/day of oral potassium may need to be added to feeds, *Never use Frusemide for oedema!*

Step 5

All ill children with SAM should get IV Penicillin (*or Ampicillin*) **AND** Gentamicin. Give 5 days of gentamicin, if improved change Pen to Amoxicillin (40mg/kg 12hrly PO) at 48 hrs. **Add**:

- Nystatin / Clotrimazole for oral thrush if present
- Albendazole after 7 days treatment.
- TEO (+ *atropine drops*) for pus/ulceration in the eye

Step 6

Correct micronutrient deficiencies. **Give**:

- Vitamin A (PO) if eye signs on admission and days 2 and 14.
- Multivits for at least 2 weeks *if no RUTF or F75/F100*
- Folic acid 2.5mg alt days *if no RUTF or F75/F100*
- Iron ONLY when child is gaining weight & *If no RUTF*

Step 7

Prescribe feeding needed (*see chart* on page 38) and place ng.

Steps 8, 9 & 10: Ensure appetite and weight are monitored and start catch-up feeding **with RUTF** or F100 (*usually day 3-7*). Provide a caring and stimulating environment for the child and start educating the family so they help in the acute treatment and are ready for discharge.

Feeding children with severe malnutrition

(age 6 - 59 months)

- If aged < 6 months use EBM or term formula or use diluted F100 - to each 100mls F100 add 35mls clean water
- When appetite returns (and oedema much improved) **change from F75 to F100 at 130mls/kg (the same volume as F75 for no oedema) in the transition phase (about 2 days)**, if F100 not available change to RUTF for transition phase.
- **After transition phase use RUTF** that has 500 kcal in 92g packets for **rehabilitation**. All vitamins, minerals and iron are in RUTF. Allow the child to nibble RUTF very frequently. RUTF can be mixed into uji or other foods slowly introduced.

Weight (kg)	F75 – acute feeding				F100 Transition phase	RUTF Transition Phase	RUTF Rehabil'n Phase
	No or moderate oedema *(130mls/kg/day)*		Severe oedema, even face *(100mls/kg/day)*		Replace starter F-75 with an equal amount of catch-up F-100 for 2 days.		
	Total Feeds / 24 hrs	3 hourly feed volume	Total Feeds / 24 hrs	3 hourly feed volume	**F100 Rehabilitation phase**	Packets per 24hrs	Packets per 24hrs
4.0	520	65	400	50	On the third day if on F-100, increase each successive feed by 10 ml until some feed remains uneaten (usually at 200ml/kg/day).	1.5	2.0
4.5	585	75	450	60			
5.0	650	80	500	65		2.1	2.5
5.5	715	90	550	70			
6.0	780	100	600	75			
6.5	845	105	650	85			
7.0	910	115	700	90	Monitor vital signs. If both pulse and breathing rates increase (breathing by 5 breaths/min and pulse by 25 beats/min), sustained for two successive 4-hourly readings, then: Reduce the volume fed to 100 ml/kg per day for 24 h.	2.5	3.0
7.5	975	120	750	95			
8.0	1040	130	800	100			
8.5	1105	140	850	110		2.8	3.5
9.0	1170	145	900	115			
9.5	1235	155	950	120		3.1	4.0
10.0	1300	160	1000	125			
10.5	1365	170	1050	135		3.6	4.0
11.0	1430	180	1100	140			
11.5	1495	185	1150	145			
12.0	1560	195	1200	150		4.0	5.0

If respiratory distress or oedema gets worse or the jugular veins are engorged reduce feed volumes

For HIV exposed/ infected children see separate protocol

History of cough or difficulty breathing, age > 60 days

Yes

ONE of the danger signs

- Oxygen saturation <90%
- Central Cyanosis
- Inability to drink / breast feed
- AVPU = 'V', 'P' or 'U', or
- Grunting

Yes — Wheeze — **SEVERE PNEUMONIA**
Admit/Refer
- Oxygen
- IV Penicillin & Gentamicin
- Continue monitoring SpO2
- Supportive care

No

- Lower chest wall indrawing

OR

- Fast breathing
  RR ≥ 50/min (Age 2-11mo)
  RR ≥ 40/min (Age 12-59mo)

Yes — Wheeze — **PNEUMONIA (NON SEVERE PNEUMONIA)**
High dose Amoxicillin DT (40-45 mg/kg/dose 12hrly)
Counsel carefully on danger signs and need to return if these develop

All children must be reviewed within 48 hrs (if review is not possible, then admit children with indrawning

No

No pneumonia,
Cough/Cold

If there is a wheeze,
Consider **POSSIBLE ASTHMA or alternative diagnosis** and treat according to separate protocol.

Pneumonia treatment failure definitions

HIV Infection or TB may underlie treatment failure- testing helps the child.
See HIV page for PCP treatment (pg 49); see TB page for PTB (page 44)

Treatment failure definition	Action required
Any time. Progression of pneumonia to severe pneumonia *(development of cyanosis or inability to drink in a child with pneumonia without these signs on admission)* Obvious cavitation on CXR	Admit the child. Change treatment from amoxicillin to penicillin and gentamicin Treat with Flucloxacillin and gentamicin IV for Staphaureus or Gram negative pneumonia.
48 hours	
Severe pneumonia child getting worse, re-assess thoroughly, get chest X ray if not already done *(looking for empyema /effusion, cavitation etc).* Pneumonia *without* improvement in at least **one** of: ✓ *Respiratory rate,* ✓ *Severity of indrawing,* ✓ *Fever,* ✓ *Ability to drink or feed.*	Switch to Ceftriaxone unless suspect Staphylococcal pneumonia then use flucloxacillin and gentamicin. *Suspect PCP especially if <12m, an HIV test **must** be done - treat for Pneumocystis if HIV positive* Admit the child. Change treatment from amoxicillin to penicillin and gentamicin.
Day 5.	
At least **three** of: ✓ *Fever, temp >38^{0}C* ✓ *Respiratory rate >60 bpm* ✓ *Still cyanosed or saturation <90% and no better than admission* ✓ *Chest in drawing persistent* ✓ *Worsening CXR*	• If only on amoxicillin, admit the child and change to penicillin and gentamicin • If on penicillin and gentamicin change to ceftriaxone. • Suspect PCP, an HIV test **must** be done - treat for Pneumocystis if HIV positive.
Persistent Cough	
Persistent fever and respiratory distress.	Consider TB, perform mantoux, CXR, and check TB treatment guidelines.

Possible asthma

Wheeze + History of cough or difficulty breathing,
(Likelihood of asthma much higher if age >12m and recurrent wheeze)

Yes

Severe Asthma
Any one of these;

- Oxygen saturation <90%
- Central cyanosis
- Inability to drink / breast feed
- AVPU= "V", "P" or "U" or
- Inability to talk/complete sentences
- Pulse rate >200 bpm (0-3 yrs) and >180 bpm (4-5yrs)
- Silent chest on auscultation

Yes →

Immediate Management
ADMIT
Oxygen
Nebulize 2.5 mg salbutamol or 6 puffs of inhaler with spacer and mask give every 20 minutes upto 3 doses if needed
Prednisolone 1-2mg/kg*
Consider ipratropium bromide 80 mcg every 20 min if poor response**
Antibiotics as for severe pneumonia

No

Mild or Moderate Asthma
Wheeze PLUS

- Lower chest wall indrawing

OR

- Fast breathing

(RR ≥ 50/min (Age 2-11mo)
RR ≥ 40/min (Age 12-59mo)

Yes →

Salbutamol 2 puffs of inhaler (or 2.5 mg nebulized) every 20 minutes upto 3 doses if needed
Oxygen

Monitor closely for 1-2 hours

If mild symptoms allow home on salbutamol MDI give 2 puffs every 6 hours.
Counsel caregiver on signs of deterioration and schedule review within 48 hours.

If lack of response to salbutamol, increasing respiratory rate, worsening saturation, any signs of severe asthma. Refer to Immediate Management above.

- Recurrence of asthma symptoms
  - Consider Inhaled corticosteroid (ICS) therapy or adjust the doses if already on ICS. **(L*ook out for other comorbidities)***
  - Demonstrate MDI and spacer use to the caregiver before discharge from the health facility. Preferably use spacer with face masks for <3 years for 4-5 years use facemask or mouthpiece.
  - Advise on regular follow up.

* Prednisolone administered for 3-5 days. Max dose of 20mg/day for < 2 years and 30mg/day for 2-5 years.

** Repeat every 20 minutes for one hour if needed.

ALGORITHM FOR DIAGNOSIS OF TB IN CHILDREN¥

History of TB

For all children presenting to a health facility ask for the following suggestive symptoms

- ✓ Cough
- ✓ Fever
- ✓ Weight loss/ poor weight gain (failure to thrive)
- ✓ Lethargy/ reduced playfulness less active

- Suspect TB if child has two or more of these suggestive symptoms
- Ask for history of contact with adult/adolescent with chronic cough or TB within the last 2 years.

Physical examination

Examine the child and check for:

- Temperature > 37.5 ºC (fever)
- Weight (to confirm poor weight gain/weight loss) - check growth with monitoring curve
- Respiratory rate (fast breathing)
- Respiratory system examination - any abnormal findings

Investigations

Examine other systems for abnormal signs suggestive of extra-pulmonary TB

Obtain specimen* for Xpert MTB/RIF (and culture when indicated**)
Do a chest Xray where available
Do a mantoux test*** where available
Do a HIV test?
Do other tests to diagnose extra-pulmonary TB where suspected

Diagnosis

Bacteriologically confirmed TB: Diagnose if specimen is positive for MTB

Make a clinical diagnosis of PTB if:

Child has **two or more** of the following symptoms:

- Persistent cough, fever, weight loss/poor weight gain (failure to thrive), lethargy

PLUS **two or more** of the following:

- Positive contact, abnormal respiratory signs, abnormal CXR, positive mantoux

Note: If child has clinical signs suggestive of EPTB, refer to National TB guidelines.

¥ National Tuberculosis, Leprosy and Lung Disease Program, Ministry of Health - Kenya. Integrated guideline for Tuberculosis, Leprosy and Lung disease 2021.

** Specimen may include: Expectorated sputum (child >5 years), induced sputum, nasopharyngeal aspirate, and gastric aspirate. Attempt to obtain specimen in every child*

***Do a culture and DST for the following children:*

1. Rifampicin resistance detected by the Xpert test
2. Refugees and children in contact with anyone who has Drug Resistant TB
3. Those not responding to TB treatment
4. Those with Indeterminate Xpert results

**** This may include IGRA in facilities where available # Use IMCI guidelines to classify severity of disease*

Treat for TB as follows:
- All children with **bacteriologically confirmed TB**
- All children with a **clinical diagnosis of TB**

NB : Children who do not have an Xpert result or their Xpert result is negative but they have clinical signs and symptoms suggestive of TB, should be treated for TB.

Regimens and dosing

TB disease category	Recommended regimen	
	Intensive phase	Continuation phase
All forms of TB except TB meningitis, bone and joint TB	2 months RHZE	4 months RH
TB meningitis Bone and joint TB	2 months RHZE	10 months RH
Drug-resistant TB	Refer to DR TB specialist	

Steroid therapy should be given for; TB meningitis and other forms of intracranial TB, PTB with respiratory distress, PTB with airway obstruction by hilar lymph nodes, severe miliary TB or pericardial effusion.

- Give **Prednisone at 2 mg/kg (max 60mg/day) once daily for 4 weeks.** Taper down over 2 weeks (1 mg/kg for 7 days, then 0.5 mg/kg for 7 days)

TB drug doses

Weight band (kg)	Number of tablets		
	Intensive phase		Continuation phase
	RHZ (75/50/150mg)	E (100mg)	RHZ (75/50mg)
< 2kg	¼	¼	¼
2.0 - 2.9kg	½	½	½
3.0 - 3.9kg	¾	¾	¾
4.0 - 7.9kg	1	1	1
8.0 - 11.9kg	2	2	2
12.0 - 15.9kg	3	3	3
16.0 - 24.9kg	4	4	4
> 25kg	Use adult dosage and preparation		

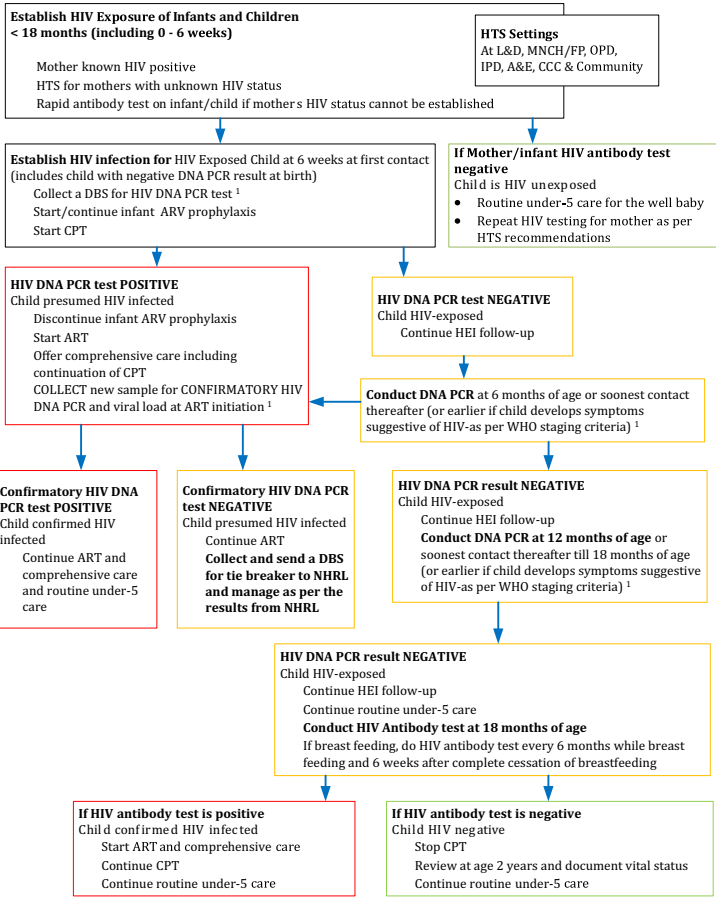
Pyridoxine (Give through the whole course of treatment)

Weight (kg)	Number of tablets of pyridoxine (50mg)
5-7	Quarter tablet daily
8-14	Half tablet daily
15 and above	One full tablet daily

Isoniazid Preventative Therapy (IPT): *Refer to National TB Guidelines*

Population	Recomendations
HIV testing and counseling of infants and children aged less than 18 months	▪ HIV exposure status of all infants should be established at the 6-week immunization visit or at first contact thereafter, using maternal medical information ▪ Conduct HIV antibody testing for mother or children less than 18 months of age and of unknown status to establish their HIV exposure status ▪ All HIV-exposed infants should be offered routine DNA PCR testing at the 6-week immunization visit, or at the earliest opportunity for infants seen after 6 weeks of age ▪ Infants with an initial positive HIV DNA PCR results should be presumed to be HIV infected and started on ART in line with national guidelines
HIV testing and counseling of children older than 18 months	▪ Conduct HIV testing and counseling for all children presenting to the health facility irrespective of reason for their visit to the health facility ▪ Conduct HIV testing and counseling for all children of HIV infected adults as soon as possible, within one month of confirming the HIV positive status of the adult
HIV testing and counseling of adolescents	▪ Conduct HIV testing and counseling for all adolescents including key populations presenting to the health facility irrespective of reason for their visit to the health facility ▪ All adolescents identified HIV positive should be linked to prevention, care and treatment services ▪ All adolescents should be counseled about the potential benefits and risks of disclosure of their HIV status and empowered and supported to determine if, when, how and to whom to disclose ▪ For sexually active adolescents with partners, HIV testing and counseling should be offered to their partners and Children

Algorithm for Early Infant Diagnosis of HIV



[1] *Where Point of Care DNA PCR is available- EID should be done using the whole blood at the facility. For baseline viral load testing – If available, use point of care machine for viral load; If there is no point of care machine to do viral load- Take a DBS and send it to the VL testing laboratory*

Presumptive Diagnosis of HIV in children < 18 months while awaiting DNA PCR Results

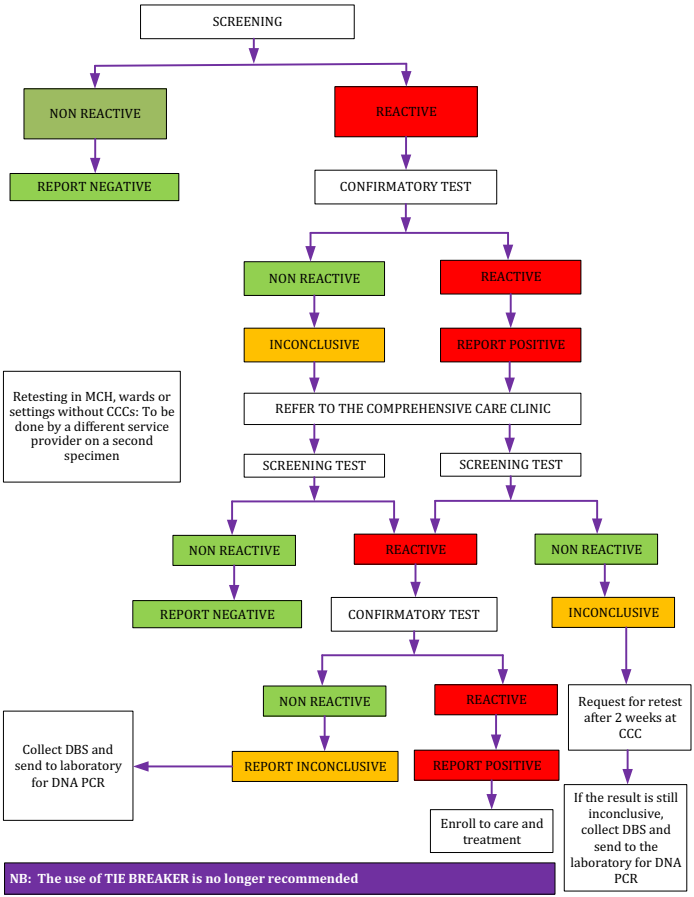
Child < 18 months of age; HIV antibody test positive and symptomatic with:
2 or more of the following:

- Oral candidiasis/thrush
- Severe pneumonia
- Severe sepsis

OR, any of the following

- Any WHO Clinical Stage 4 condition
- Recent maternal death (if likely to be have been HIV-related) or advanced HIV disease in mother
- Child's CD4% < 25%

HIV Testing Services Algorithm for the child >18 months



ARVs for Infant Prophylxis

Infant prophylaxis:

- AZT+NVP for 6 weeks, NVP should be continued until 6 weeks after complete cessation of breastfeeding.
- Infant prophylaxis can be discontinued after a minimum of 12 weeks on NVP if the child is not breastfeeding (death of mother or separation with mother).

Dosing of ARVs for Infant Prophylaxis from birth to 12wks of age

Age/Weight	Dosing of NVP (10mg/ml) OD	Dosing of AZT (10mg/ml) BD
Birth to 6 weeks		
Birth weight < 2,000 g	2 mg/kg per dose, OD	4 mg/kg per dose, BD
Birth weight 2,000-2,499 g	10 mg (1 ml), OD	10 mg (1 ml), BD
Birth weight ≥ 2,500 g	15 mg (1.5 ml), OD	15 mg (1.5 ml), BD
> 6 weeks to 12 weeks of age*		
Any weight	20 mg (2 ml), OD	60 mg (6 ml), BD
> 12 weeks (Table 7.5 and 7.6)		

*Dose adjustment required once child reaches 6 weeks of age

Nevirapine dosing for infant prophylaxis beyond 12wks of age*

Age	Dosing of NVP (10mg/ml) Once Daily
12 weeks – 6 months	25 mg (2.5 ml), OD
7 months – 9 months	30 mg (3 ml), OD
10 months – 12 months	40 mg (4 ml), OD
> 12 months	Consult the Regional or National HIV Clinical TWG (Uliza Toll-free Hotline 0800 72 48 48; ulizanascop@gmail.com)

* If child presents to facility late and has to be on AZT and NVP beyond 12 weeks of age

AZT Dosing for Infant Prophylaxis beyond 12 Weeks of Age

Weight	Dosing of AZT: (10mg/ml syrup) Twice Daily
3.0-5.9 kg	6 ml, BD
6.0-9.9 kg	9 ml, BD
10.0-13.9 kg	12 ml, BD
14.0-19.9 kg	15 ml, BD

* If child presents to facility late and has to be on AZT and NVP beyond 12 weeks of age

Neonatal Resuscitation

For trained health workers - Anticipate and prepare

Note for all newborns:

- Practice immediate cord clamping and cutting for newborns requiring resuscitation
- For newborns with good heart rate and spontaneous breathing, practice delayed cord clamping and cutting (1-3 mins)

PREPARE BEFORE DELIVERY - EQUIPMENT, WARMTH, GETTING HELP

Breathing should be started within 60 secs

Initial steps of stabilization:
- dry & stimulate baby with warm towel
- observe for Crying/breathing (not laboured?) Good muscle tone?
- cover with warm dry towel

Is baby crying/breathing (not laboured?) Good muscle tone?

No to any one

Immediate cord cutting & transfer to radiant warmer

Yes

Place on mother's abdomen for skin-to-skin care, delayed cord cutting, initiate breastfeeding & essential newborn care

A - Airway

- **Check if airway is clear**
  If secretions are visible, use suction to clear
- Put head in **sniffing** position

B - Breathing

Is baby breathing?

Yes

Laboured breathing?

Yes

Oxygen/ CPAP

No

- Keep warm
- Monitor rate of breathing and heart rate

Poor or No breathing/gasping

SHOUT FOR HELP!

Start ventilation with room air ensuring the chest rises at **40-60 breaths/min**

After 1 min, check heart rate for 5-10 secs

C - Circulation

Is heart rate >60bpm?

Yes

Continue ventilations for **1 min at 40-60breaths**

No

- **Connect 100% oxygen**
- Give 1 EFFECTIVE breath for every 3 chest compressions for 1 min

Reassess ABC after 1 minute

Regular breathing (RR >30bpm) + HR >60bpm:
- Give oxygen & titrate against SpO2 (90-95%)
- IVF/EBM
- Blood sugars 2hrs after birth
- Keep warm & maintain at 36.5-37.5°C
- ENC- Vit K, cord care, eye care
- Treat infections if indicated
- Family centered care
- Ensure HIV risk is known

Newborn care management guidelines

1. Keep warm and maintain body temperature 36.5-37.5°C
2. Apply 7.1% Chlorhexidine digluconate on the cord immediately after cutting the cord and then once daily up to the 7th day or until the cord falls off, whichever comes first (see next page on procedure)

3. Vitamin K
- All babies born in hospital should receive Vitamin K soon after birth
- All infants aged < 14 days should receive Vitamin K on admission if not already given.
- If born at home and admitted aged < 14 days give Vitamin K unless already given
- **1mg Vitamin K IM if weight < 1.5kg, 0.5mg IM if weight < 1.5kg**

4. Administer TEO to all newborns

5. Growth

Preterm babies should gain about 10-15g/kg/d of body weight every day after the first 7 days of life. Term babies gain weight at 20-30g/d. If they are not, check that the right amount of feed is being given.

6. Vitamins and Minerals

All premature infants (< 36 weeks or < 2kg) should receive the following vitamins and minerals daily once they are on full feeds and/or at age of 2 weeks for a minimum of 6 months:
- 2.5 mls of multivitamin syrup daily once they are on full milk feeding at the age of about 2 wks
- Folate 2.5mg weekly
- Give iron supplementation (refer to page 7 for dosages)
- Give Vit D 400IU orally daily
- Add daily calcium supplements(120-140mg/kg/d elemental calcium) from day 28 of life after checking calcium
- Daily phosphorus (60-90mg/kg/d)

7. Kangaroo mother care (KMC)

KMC recommended for stable pre-terms (refer to National KMC Guidelines)

Application steps for Chlorhexidine gel to the newborn umbilical cord in the immediate post delivery period

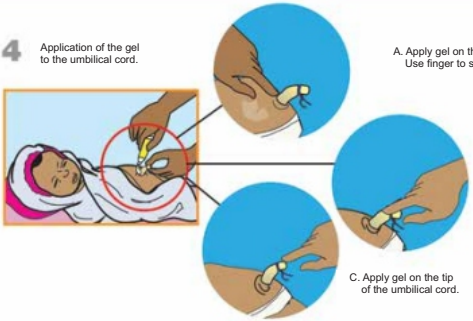
Use of 7.1% Chlorhexidine digluconate which delivers 4% Chlorhexidine to prevent infection in newborn is recommended immediately the cord is cut

Chlorhexidine of newborn cord care exists in different preparations and packages. Always store your Chlorhexidine in a cool, clean, dry place.

In preparation to apply Chlorhexidine to the newborns umbilical cord, change gloves.

Open and squeeze the tube or satchet to apply Chlorhexidine gel.

4 Application of the gel to the umbilical cord.



A. Apply gel on the base of the umbilical cord. Use finger to spread the gel.

B. Apply gel on the stamp of the umbilical cord.

C. Apply gel on the tip of the umbilical cord.

Do not clean off any Chlorhexidine gel from the umbilical cord after application.

Do not apply anything else after applying Chlorhexidine.

WARNING

7.1% Chlorhexidine digluconate gel is for use on the newborn umbilical cord only

Do not swallow

Keep away from eyes, nose, ears and mouth

Newborn ≥ 1.5kg: Feeding / Fluid requirements

- ✓ **Well baby** - Immediate milk feeding -**Table A**. For first feed give 7.5mls and increase by this amount each feed until full daily volume reached
- ✓ **Day 1 - Sick baby** start with 24hrs IV 10%D to stimulate the gut, give **2mls/kg of colostrum via NGT every 3hrs** to be started when ABC are stabilized - **do not deduct this from IVF**.
- ✓ From Day 2 unless baby very unwell start NGT feeds - Begin with 7.5mls 3hrly if ≥1.5kg & <2kg; and 10mls 3hrly if ≥ 2kg. Increase feed by the same amount every day and reduce iv fluids to keep within the total daily volume until IVF stopped – **Table C**
- ✓ For IV fluids from Day 2 Add Na+ 2-3mmol/kg/day (19mls/kg of normal saline) and K+ 1-2mmol/kg/day to 10% glucose solution.
- ✓ Always feed with EBM unless contra-indicated.
- ✓ Maximum fluid that can be given intravenously is 150ml/kg/d. Maximum snteral feed volume is 180ml/kg/d. It may be possible to increase enteral feeds further to as much as 200mls/kg/day but seek expert advice.
- ✓ If signs of poor perfusion or fluid overload please ask for senior opinion on whether to give a bolus, step-up or step-down daily fluids.

Age	Total Daily Fluid / Milk Vol.
Day 1	60 mls/kg/day
Day 2	80 mls/kg/day
Day 3	100 mls/kg/day
Day 4	120 mls/kg/day
Day 5	140 mls/kg/day
Day 6	160 mls/kg/day
Day 7	180 mls/kg/day

A. Nasogastric 3 hrly feed amounts for well babies on full volume feeds on day 1 and afterwards

Weight (kg)	1.5 to 1.6	1.7 to 1.8	1.9 to 2.0	2.1 to 2.2	2.3 to 2.4	2.5 to 2.6	2.7 to 2.8	2.9 to 3.0	3.1 to 3.2	3.3 to 3.4	3.5 to 3.6	3.7 to 3.8	3.9 to 4.0
Day 1	12	14	15	17	18	20	21	23	24	26	27	29	30
Day 2	15	18	20	22	24	26	28	30	32	34	36	38	40
Day 3	19	23	25	28	30	33	35	38	40	43	45	48	50
Day 4	24	27	30	33	36	39	42	45	48	51	54	57	60
Day 5	28	32	35	39	42	46	49	53	56	60	63	67	70
Day 6	32	36	40	44	48	52	56	60	64	68	72	76	80
Day 7	36	41	45	50	54	59	63	68	72	77	81	86	90

B. IV fluid rates in mls/hr for sick newborns ≥ 1.5kg who cannot be fed

Weight (kg)	1.5 to 1.59kg	1.6 to 1.7kg	1.8 to 1.9kg	2.0 to 2.1kg	2.2 to 2.3kg	2.4 to 2.5kg	2.6 to 2.7kg	2.8 to 2.9kg	3.0 to 3.1kg	3.2 to 3.3kg	3.4 to 3.5kg	3.6 to 3.7kg	3.8 to 3.9kg
Day 1	4	4	5	5	6	6	7	7	8	8	9	9	10
Day 2	5	6	6	7	8	8	9	10	10	11	12	12	13
Day 3	6	7	8	9	10	10	11	12	13	14	15	15	16
Day 4	8	9	10	11	12	13	14	15	16	17	18	19	20
Day 5	9	10	11	12	13	15	16	17	18	19	20	22	23

C. Standard regimen for introducing NGT feeds in a sick newborn ≥ 1.5kg after 24 hrs IV fluids

Weight (kg)	1.5		1.6 - 1.7		1.8 - 1.9		2.0 - 2.1		2.2 - 2.3		2.4 - 2.5		2.6 - 2.7		2.8 - 2.9	
	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed
Day 1	4	0	4	0	5	0	5	0	6	0	6	0	7	0	7	0
Day 2	3	5	3	8	4	8	4	10	4	10	5	10	6	10	6	10
Day 3	3	10	2	15	3	15	2	20	3	20	4	20	5	20	5	20
Day 4	3	15	1	22	2	22	0	30	2	30	3	30	4	30	5	30
Day 5+	2	20	0	30	1	30	0	36	0	39	1	40	2	40	4	40

Newborn < 1.5kg: Feeding / Fluid requirements (sick newborns)

Age	Total Daily Fluid / Milk Vol.
Day 1	80 mls/kg/day
Day 2	100 mls/kg/day
Day 3	120 mls/kg/day
Day 4	140 mls/kg/day
Day 5	160 mls/kg/day
Day 6+	180 mls/kg/day

- **Day 1 - Sick baby** (convulsions, unconscious, severe respiratory distress evidenced by severe chest wall indrawing, absent bowel sounds) start iv 10%D for 24hrs. To stimulate the gut, give 2mls/kg of colostrum via NGT every 3hrs to be started when A,B,C are stabilized - do not deduct this from IVF!
- **Day 2:** Start feeding with EBM via NGT (unless baby is still unstable) at 30ml/kg/day EBM. Increase the EBM feeds by 30m/kg/day and reduce IV fluids to keep within the total daily volume until IVF stopped ie until full 3 hourly feed volume achieved appropriate for weight and postnatal age in days. Increase total feeds (IVF + EBM) by 20ml/kg/day to max of 150ml/kg/day. Once no longer on IVF increase to max of 180ml/kg/day, but it may be possible to
- For IV fluids from Day 2 Add Na+ 2-3mmol/kg/day (19mls/kg of normal saline) and K+ 1-2mmol/kg/day to 10% glucose solution.
- Always feed with EBM unless contra-indicated.
- Maximum fluid that can be given intravenously is 150ml/kg/d.
- Maximum internal feed volume is 180ml/kg/d.
- It may be possible to increase enteral feeds further to as much as 200mls/kg/day but seek expert advice.

Hourly IV Fluid rates for Newborns <1.5kg:
Using a burette / soluset with 60 drops = 1ml
then drip rate = mls/hr

Weight (kg)	0.8 to 0.9	0.9 to 1.0	1.1. to 1.2	1.3 to 1.4	1.4 to 1.5	Weight (kg)
Day 1	3	3	4	4	5	Day 1
Day 2	4	4	5	5	6	Day 2
Day 3	5	5	6	7	8	Day 3
Day 4	5	6	6	8	9	Day 4
Day 5+	6	7	7	9	10	Day 5+

Standard regimen for introducing NGT feeds for sick newborns <1.5kg

0.8 - 0.9		0.9 - 1.0		1.1 - 1.2		1.3 - 1.4		1.4 - 1.5	
IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed
3	0	3	0	4	0	3	0	4	0
2	5	3	5	3	5	4	5	5	5
1	10	2	10	2	10	3	10	4	10
0	15	1	15	1	15	3	15	4	15
0	16	0	18	0	22	2	26	3	28

Newborn < 1.5kg: Feeding requirements (well newborns)

All babies <1.5 kg and well (without respiratory distress, who have not required BVM resuscitation, and do not have a congenital malformation as a contraindication to feeding) start feeds with EBM of 5 mls and increase by 5 mls **each 3 hourly feed** until full 3 hourly feed volume achieved (80 mls/kg/day on day 1 and increasing by 20mls/kg each day)

Always use EBM for NGT feeds unless contra-indicated

Causes of failure to gain weight should be carefully investigated; if underlying causes have been excluded case by case decisions should be made on how best to support nutritional intakes to enable growth

Fortifiers are not routinely required but such babies should routinely receive recommended vitamin and mineral supplements at appropriate post-gestational ages.

It may be possible to increase volumes further to as much as 200mls/kg/day but seek expert advice.

Weight (Kg)	0.8-0.9 NG 3 hourly feed	0.9.-1.0 NG 3 hourly feed	1.1-1.2 NG 3 hourly feed	1.3-1.4 NG 3 hourly feed	1.4-1.5 NG 3 hourly feed	Total Daily Fluid/Milk Volume
Day 1	8	9	11	13	14	80ml/kg/day
Day 2	10	11	14	16	18	100ml/kg/day
Day 3	12	14	17	20	21	120ml/kg/day
Day 4	14	16	19	23	25	140mls/kg/day
Day 5	16	18	22	26	28	160mls/kg/day
Day 6	18	20	25	29	31	180ml/kg/day

Early Onset Neonatal Hypoglycemia

Age 0-72hrs of life

All well and not at risk neonates

*All high risk neonates at birth

All sick neonates

BG at 2hrs of age

Immediate blood Glucose

Blood Glucose equal to or more than 2.6mmol/l?

Yes

No

1. Keep warm and maintain skin contact
2. If able to BF, feed as per the cues, if not NGT or IVF continue feeding as per guidelines
3. Monitor for at least 12hrs for IODM/LGA and 24hrs for preterms/SGA.

Hypoglycaemia

Blood Glucose less than 2.6mmol/l

Asymptomatic & BG equal or more that 1.8mmol/l

Symptomatic or BG less than 1.8mmol/l

0.4ml/kg 50% buccal glucose & Cup feed or insert NGT

0.4ml/kg 50% buccal glucose & fix IV line

Immediate EBM through NGT volume for 3hrly feed and CT regular 3hrly feeds

10% Dextrose 2ml/kg mini-bolus over 3minutes and immediately start maintenance IVF. Start EBM as soon as baby's condition allows, 3hrly feed volume through NGT. Continue regular 3hrly feeds

BG after 1-2hrs then prior to the 3hrly feed
If normal BG on 3 consecutive measurement then measure 6hrly

Monitor: BG after 30minutes after the mini-bolus then 3hrly (if on EBM BG prior to the 3hrly feed).
If normal BG on 3 consecutive measurement - 6hrly

If BG remains low

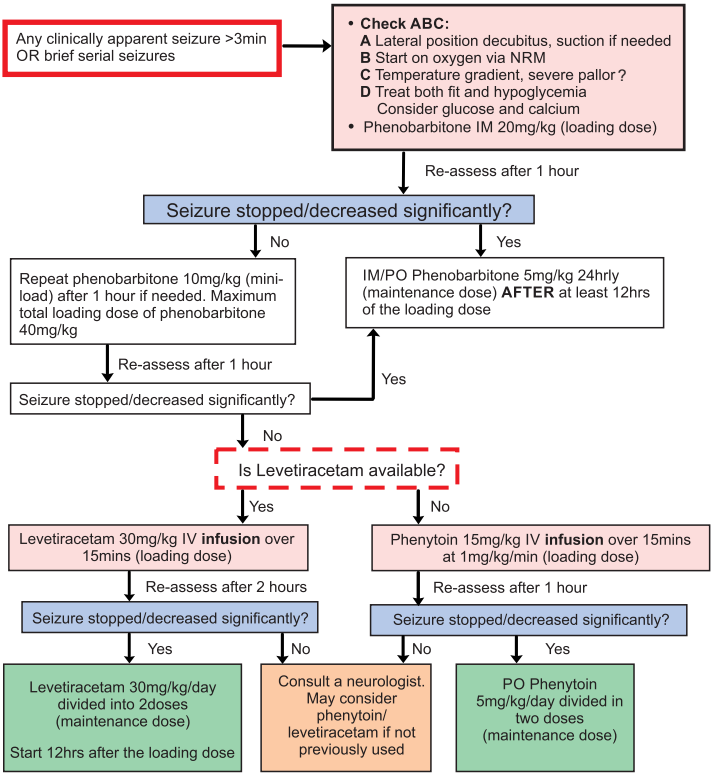
Symptoms and signs associated with hypoglycaemia

	Mild-moderate (Don't miss these signs!)	Severe
CNS	Jitteriness, irritability, High pitched cry Lethargy, hypotonia, Tremors, Hypothermia	Seizure
RS	Tachypnoea	Apnoea, Cyanosis
CVS	Tachycardia, Sweating	Pallor (circulatory collapse)
GI	Poor feeding, Vomiting	

High-risk neonates include preterms, IUGR, SGA, hypothermia, perinatal asphyxia, IODM, LGA, delayed start of feeding and maternal risk factors (beta agonists, history of DM (maternal/family), obesity, sibling history of seizures/sudden death)

Neonatal Convulsions

In the absence of clinical seizures, neonates with hypoxic-ischaemic encephalopathy need not to be given prophylactic treatment with phenobarbitone



WHEN TO STOP ANTICONVULSANTS:

1. In neonates with normal neurological examination and/or normal electroencephalography, consider stopping antiepileptic drugs if neonate has been seizure-free for more than 72hrs; the drug(s) should be reinstituted in case of recurrence of seizures.
2. In neonates in whom seizure control is achieved with a single antiepileptic drug, the drug can be discontinued abruptly without any tapering of the doses.
3. In neonates requiring more than one antiepileptic drug for seizure control, the drugs may be stopped one by one, with phenobarbital being the last drug to be withdrawn.

- ✓ Assess for jaundice in bright, natural light if possible, check the eyes, blanched skin on nose and the sole of the foot
- ✓ Refer early if jaundice in those aged <24 hrs and facility cannot provide phototherapy and exchange transfusion
- ✓ If bilirubin measure unavailable start phototherapy in the following:
  - In a well-baby with jaundice easily visible on the sole of the foot
  - In a preterm baby with ANY visible jaundice
  - In a baby with easily visible jaundice and inability to feed or other signs of neurological impairment and consider immediate exchange transfusion

- ✓ Risk factors for bilirubin encephalopathy- dehydration, preterm births, respiratory distress, sepsis, hypoxia,seizures.
- ✓ Stop phototherapy - when bilirubin levels 50 micromol/L lower than phototherapy threshold (see next page) for the baby's age on day of testing.

Phototherapy and supportive care - checklist

1. **Shield the eyes with eye patches** - Remove periodically such as during feeds
2. **Keep the baby naked** (except for a small sized diaper covering only the genital area for hygiene purposes)
3. Place the the baby at the centre at the cot - have one baby for every phototherapy machine
4. Using a light metre measure the irradiance required. Ensure the baby's head, hands and feet receive the desired irradiance.
5. **Do not place anything on the phototherapy devices including linen** - lights and baby need to be kept cool so do not block air vents / flow or light. Also keep device clean - dust can carry bacteria and reduce light
6. **Monitor vital signs especially temperature** every 3 hrs and weight every alternate day.
8. **Periodic (12 to 24 hrs)** plasma/serum bilirubin test. Visual testing for jaundice or transcutaneous bilirubin is unreliable.
9. **Make sure that each light source is working** and emitting light. Fluorescent tube lights should be replaced if:
   - More than 6 months in use (or usage time >2000 hrs)
   - Tube ends have blackened
   - Lights flicker
10. LED lights:
    - Generate less heat thus monitor for hypothermia- ensure the temperature where the phototherapy will take place has a room temperature of 25-28°C

Neonatal Jaundice

Examine every baby for jaundice: sclera, gum, palm and sole of feet

Must measure bilirubin within 2hrs in baby with:
- Jaundice on 1st day of life
- Jaundice on sole and palms
- Jaundice in preterms <35 weeks
- Jaundice plus any danger sign
- Any jaundice in a baby with history of a sibling who had jaundice that required exchange transfusion or phototherapy
- Jaundice in baby with Rh incompatibility
- Any jaundiced neonate in NBU

Investigate for causes of jaundice

Serum bilirubin below level of phototherapy

Serum bilirubin 1–50µmol/l below the level of phototherapy. Repeat after 24hrs

Serum bilirubin above level phototherapy but below the level of exchange transfusion

Serum bilirubin level of exchange transfusion

Phototherapy irradiance 30-35 µW/cm^2/nm. Prepare for exchange transfusion

Serum bilirubin below level of exchange transfusion by more than 50µmol/l

Standard Phototherapy irradiance 25-30 µW/cm^2/nm.

Encourage short breastfeeding, & bonding breaks (less than 30min every 3hrs)
Do not give additional fluids/feeds.

Monitor adequacy of feeding by assessing wet diapers and alternate day weight.
Monitor vital signs

Serum bilirubin below level of exchange transfusion by less than 50µmol/l

Intensive Phototherapy irradiance 30-35 µW/cm^2/nm.

Feed via NGT or IV & Lactation support
Monitor adequacy of feeding by assessing wet diapers and alternate day weight.
Monitor vital signs

Check serum bilirubin level 6 hrs after starting phototherapy
Check bilirubin level every 12hrs if level stable or falling

Level at more than 50µmol/l below threshold for phototherapy
- stop phototherapy
- repeat level after 24hrs

Level within phototherapy range but more than 50µmol/l below exchange transfusion level 25-30 irradiance

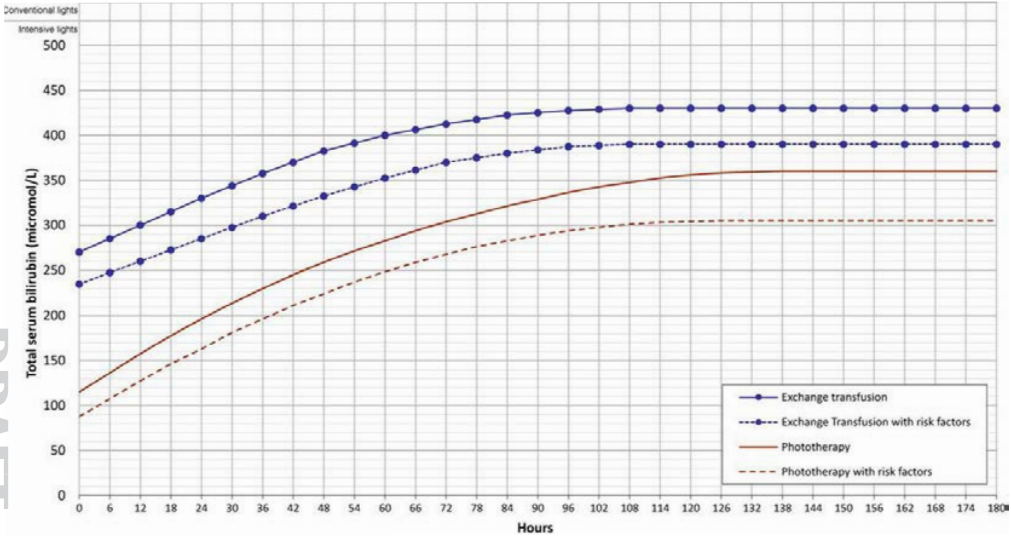
Level below level of exchange transfusion by less than 50µmol/l- continue 30-35 irradiance

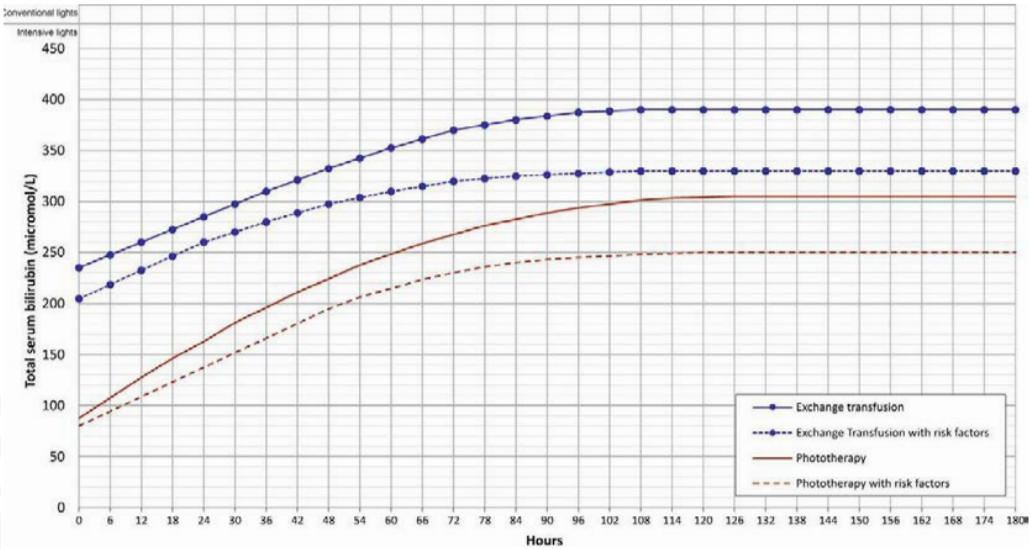
Level above threshold for exchange transfusion and/or clinical signs of acute encephalopathy - exchange transfusion

Risk factors for bilirubin encephalopathy : dehydration, preterm births, respiratory distress, sepsis, hypoxia, seizures, acidosis, rate of increase of bilirubin level.

In the presence of risk factors (sepsis, haemolysis, acidosis or asphyxia) use the lower line.

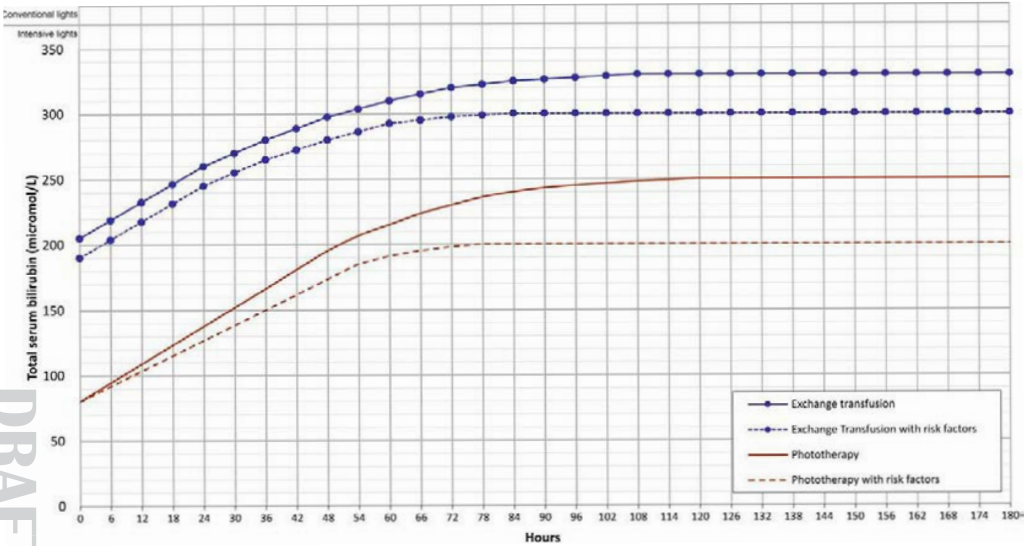
2. If baby is greater than 12 hours old with total serum bilirubin (TSB) 1–50 micromol/L below the line, repeat the TSB within 6–24 hours.
3. Babies under phototherapy:
   a. Consider measuring the TSB 4–6 hourly until the rise of serum bilirubin is known to be controlled, then measure TSB 12-24 hourly.
   b. Stop phototherapy if the TSB is greater than 50 micromol/L below line and recheck in 12-24 hours.
4. If baby presents with TSB above threshold and the TSB is not expected to be below the threshold after 6 hours of intensive phototherapy, an exchange transfusion is indicated.
5. If there are signs of bilirubin encephalopathy an immediate exchange transfusion is recommended.




Conventional lights
Intensive lights
Total serum bilirubin (micromol/L)
450
400
350
300
250
200
150
100
50
0
0 6 12 18 24 30 36 42 48 54 60 66 72 78 84 90 96 102 108 114 120 126 132 138 144 150 156 162 168 174 180
Hours
Exchange transfusion
Exchange Transfusion with risk factors
Phototherapy
Phototherapy with risk factors

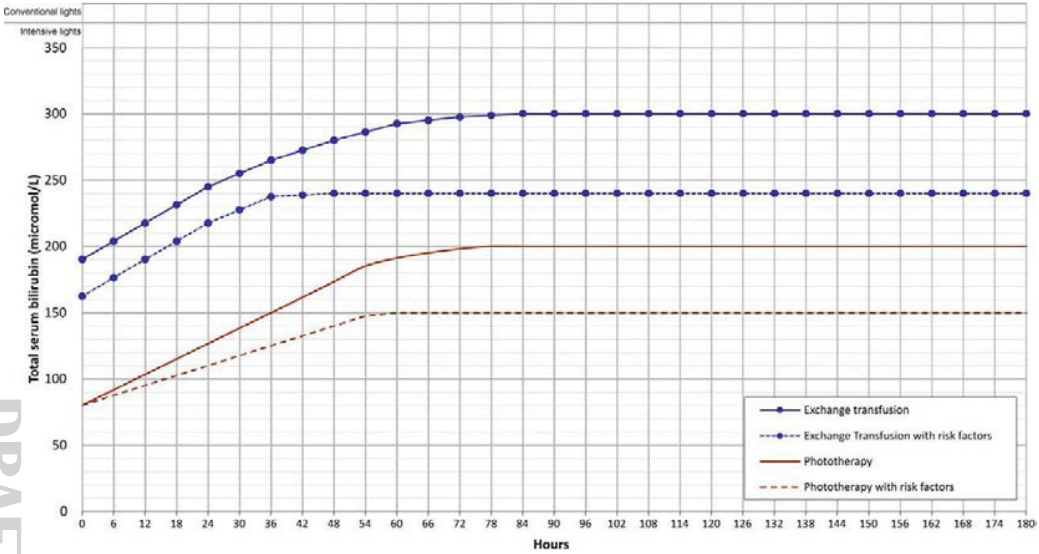
Normogram C

Jaundice management for baby less than 35 weeks gestation, greater than 1999 g birth weight



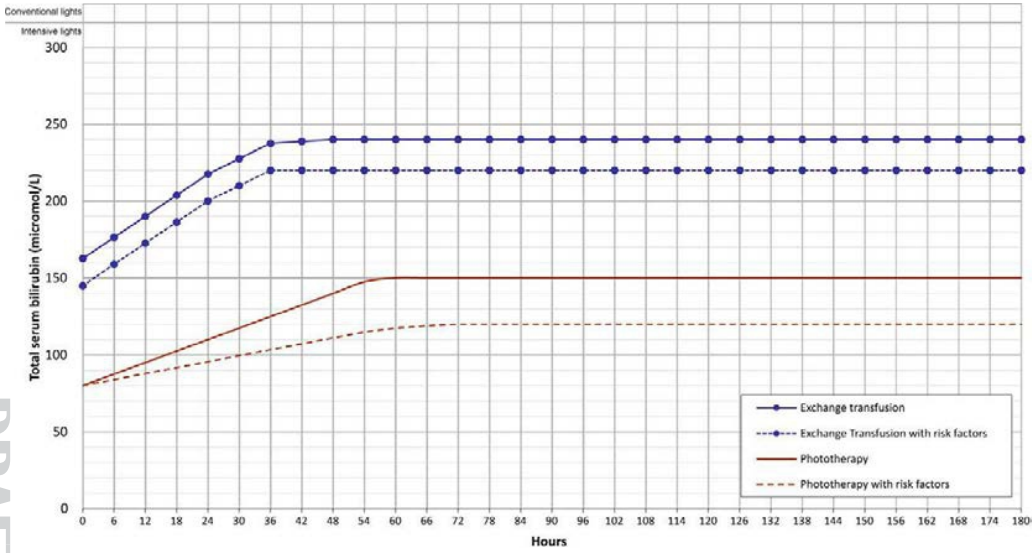
Normogram D

Jaundice management for baby less than 35 weeks gestation, 1500 g to 1999 g birth weight

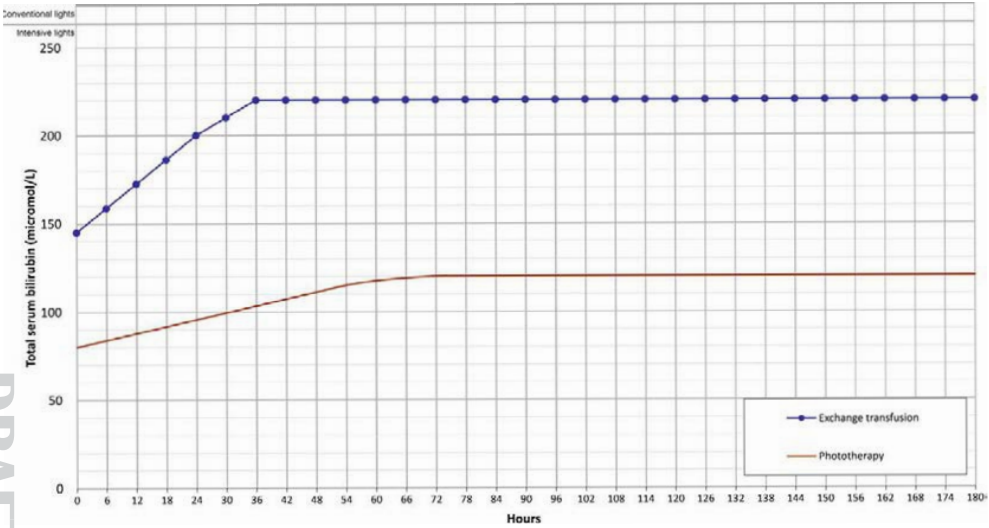


Normogram E

Jaundice management for baby less than 35 weeks gestation 1000 g to 1499 g birth weight

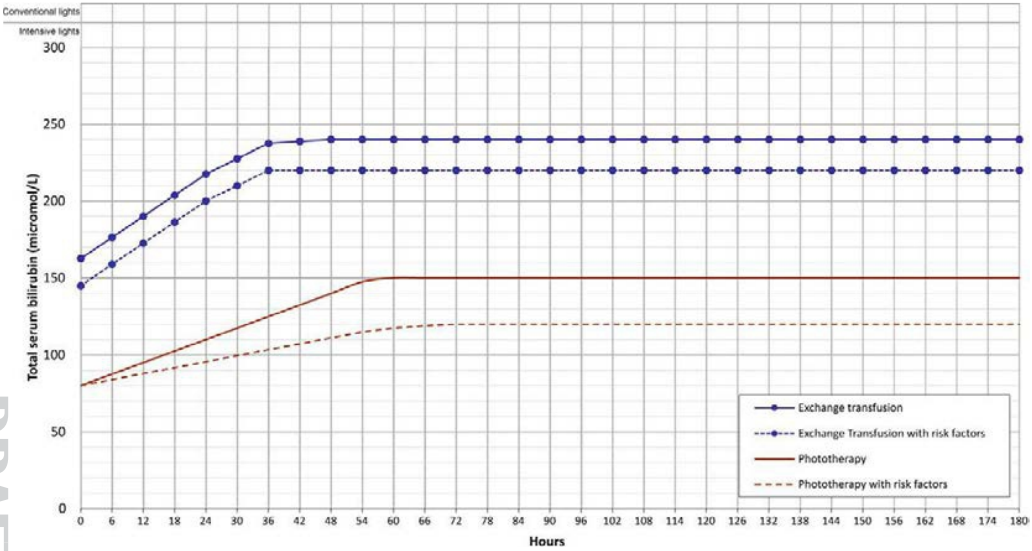


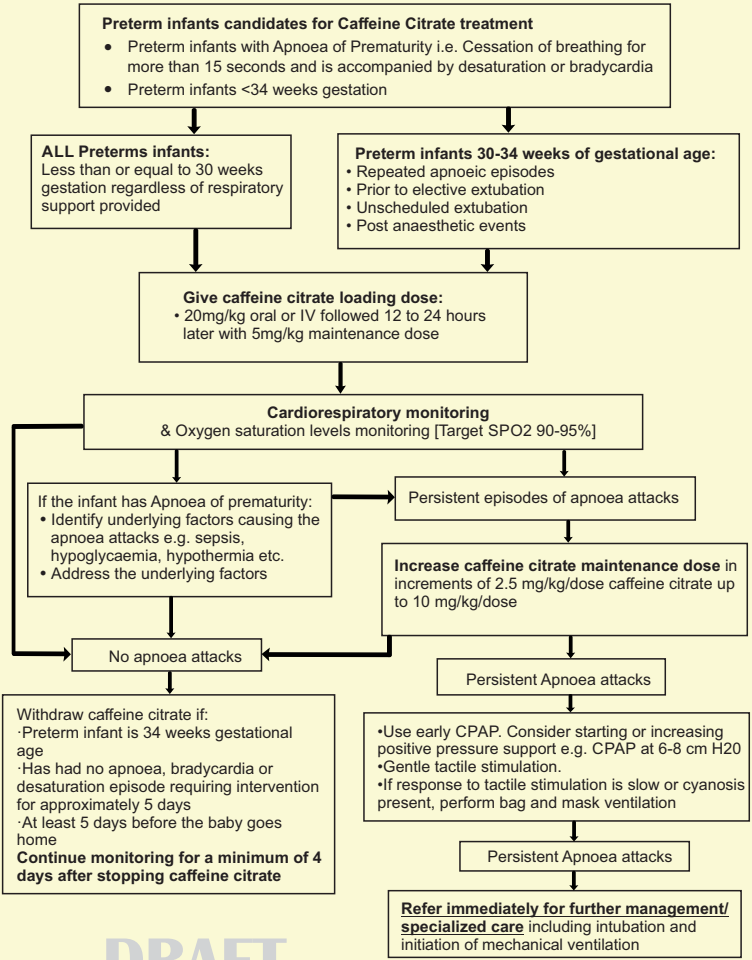
Jaundice management for baby less than 35 weeks gestation less than 1000g birth weight



Normogram G

Jaundice management for baby less than 35 weeks gestation 1000 g to 1499 g birth weight




Preterm infants candidates for Caffeine Citrate treatment
• Preterm infants with Apnoea of Prematurity i.e. Cessation of breathing for more than 15 seconds and is accompanied by desaturation or bradycardia
• Preterm infants <34 weeks gestation
ALL Preterms infants:
Less than or equal to 30 weeks gestation regardless of respiratory support provided
Preterm infants 30-34 weeks of gestational age:
• Repeated apnoeic episodes
• Prior to elective extubation
• Unscheduled extubation
• Post anaesthetic events
Give caffeine citrate loading dose:
• 20mg/kg oral or IV followed 12 to 24 hours later with 5mg/kg maintenance dose
Cardiorespiratory monitoring
& Oxygen saturation levels monitoring [Target SPO2 90-95%]
If the infant has Apnoea of prematurity:
• Identify underlying factors causing the apnoea attacks e.g. sepsis, hypoglycaemia, hypothermia etc.
• Address the underlying factors
Persistent episodes of apnoea attacks
Increase caffeine citrate maintenance dose in increments of 2.5 mg/kg/dose caffeine citrate up to 10 mg/kg/dose
No apnoea attacks
Persistent Apnoea attacks
Withdraw caffeine citrate if:
·Preterm infant is 34 weeks gestational age
·Has had no apnoea, bradycardia or desaturation episode requiring intervention for approximately 5 days
·At least 5 days before the baby goes home
Continue monitoring for a minimum of 4 days after stopping caffeine citrate
•Use early CPAP. Consider starting or increasing positive pressure support e.g. CPAP at 6-8 cm H20
•Gentle tactile stimulation.
•If response to tactile stimulation is slow or cyanosis present, perform bag and mask ventilation
Persistent Apnoea attacks
Refer immediately for further management/ specialized care including intubation and initiation of mechanical ventilation

Continuous Positive Airway Pressure (CPAP)

AT BIRTH – IN DELIVERY ROOM
Babies with spontaneous respiration and HR more than 100b/min (with or without resuscitation

Below 28 weeks (< 1000g)

Oxygen 1L/min via nasal prongs (If resources available, initiate prophylactic CPAP)

Preterms 28-30 weeks (1001-1300g)

Initiate prophylactic CPAP in delivery ward (or oxygen 1L/min – transfer to NBU for immediate CPAP)

Preterms >30 weeks (>1300g)

NEONATES IN NBU
Spontaneous respiration but have respiratory distress

One or more of:
- Resp rate > 60b/min
- Grunting
- Nasal flaring
- Sternal, intercostal recession
- Severe lower chest wall indrawing

Yes

- Oxygen 1l/min via nasal prongs
- Give IVF/EBM by NGT
- Prevent/ treat hypoglycemia
- Treat infections
- Keep warm
- Minimal handling
- If newly born - give essential newborn care

Initiate rescue CPAP at a minimum of 5cmH2O. The other settings are as per the standards of practice for the device being used

Reassess patients HR, RR, SPO2, signs of respiratory distress after 15 mins, 1hr, then 3hrly whenever the CPAP settings are changed

Not Improving

SPO2 ≥ 90% but severe respiratory distress, increase CPAP settings as per the standards of practice.
CONSULT A SENIOR
Maintain SPO2 at 90-95%
Each time reassess for complications* or alternative diagnosis

No

Reassess after 15 min

SPO2 90-95% and signs of respiratory distress improving

Yes

Continue oxygen 1l/min via nasal prongs.
Monitor SPO2/3hrly to target SpO2 90-95%

Improving

SpO2 ≥ 90% &signs of respiratory distress improving, maintain same level of CPAP and reassess every 3 hours
Each time, reassess for complications.
Titrate oxygen and maintain SpO2 at 90-95%

After a minimum of 24hrs on CPAP & SpO2 is consistently above 95% with no signs of respiratory distress:
- Decrease FiO2 before pressure, as per the standards of practice, to achieve SpO2 of 90-95%
- Stop CPAP if stable at FiO2 of 30% oxygen, pressure 5cm of water and SpO2 of 90-95%
- Start oxygen at 1l/min via nasal prongs. Monitor SpO2 at 15 mins.
- If stable continue monitoring 3 hourly

NOTE!
CPAP NOT TO BE DONE FOR NEONATES WITH:

APGAR score of less 4 at 5 min

DEFER CPAP FOR NEONATES WITH:
- Uncontrollable seizures
- Apnoea/gasping respiration

*Complications of CPAP include air leak syndromes e.g. pneumothorax, abdominal distention, pressure injury e.g. nasal septum necrosis/distortion of nares, hypoxia or oxygen toxicity

Neonatal Sepsis

Age <60days

Has **ONE** of the following:

- **Unconscious**
- **History of Convulsions**
- **Unable to feed at all**
- Apnea
- Unable to cry
- Central cyanosis/SpO2 <90%
- Bulging fontanelle
- Persistent vomiting

YES

Severe neonatal sepsis:

- Admit
- Oxygen if SpO2 <90%
- Keep warm if temp <35.5°C; expose if temp ≥38°C
- Check for hypoglycemia, treat if unable to measure glucose page 57
- NGT feeds or IVF page 53
- Do blood cultures; LP
- IV Crystalline penicillin
- Gentamicin for a min of 7days page 72

NO

Has **ONE** of the following:

- Movement only when stimulated,
- Not feeding well on observation,
- Temp ≥38°C or <35.5°C,
- Severe chest wall in-drawing

YES

Neonatal sepsis:

- Admit
- Keep warm if temp <35.5°C; expose if temp ≥38°C
- Prevent and manage hypoglycemia page 57
- NGT feeds or IVF page 53
- IV Crystalline penicillin gentamicin for 2 days then oral amoxicillin for 5 days as outpatient page 72

NO

Systemic bacterial infection unlikely

Assess for other illness and treat appropriately. Give mother advice and arrange for review.

For severe neonatal sepsis or neonatal sepsis:

1) Metronidazole may be added if necrotizing enterocolitis is suspected
2) Flucloxacillin and gentamicin is preferred in:

- Suspected staphylococcal septicaemia
- Neonates with signs of sepsis and also has extensive skin pustules/abscess/omphalitis

Duration of treatment for neonatal sepsis

Problem	Days of treatment
Signs of neonatal Infection in a baby breast feeding well.	▪ IV Antibiotics could be stopped after 48 hours if all the signs of possible sepsis have resolved and the child is feeding well **and** LP, if done, is normal. ▪ Give oral treatment to **complete** 5 days in total. Advise the mother to return with the child if problems recur. ▪ Review the child after 48 hours.
Skin infection with signs of generalised illness such as poor feeding	▪ IV / IM antibiotics could be stopped after 72 hours if the child is feeding well without fever and has no other problem **and** LP, if done, is normal. ▪ Oral antibiotics should be continued for a further 5 days.
Clinical or radiological pneumonia.	▪ IV / IM antibiotics should be continued for a minimum of 5 days or until completely well for 24 hrs. ▪ For positive LP see below.
Severe Neonatal Sepsis	▪ The child should have had an LP. ▪ IV / IM antibiotics should be continued for a minimum of 7 days or until completely well if the LP is clear
Neonatal meningitis or severe sepsis and no LP performed	▪ IV / IM antibiotics should be continued for a minimum of 14 days. ▪ If Gram negative meningitis is suspected treatment should be IV for 3 weeks.

Antibiotic prophylaxis

Antibiotic prophylaxis (Benzyl Penicillin and Gentamicin standard dose) should be given as soon as possible after birth to all newborns (term and preterms) with any one of the following risk factors:

- Prolonged Rupture of Membranes (PROM) >18 hours
- A mother with fever (Temperature > 38º C)
- Suspected or Confirmed chorioamnionitis
- Mother being treated for sepsis at any time during labour or in the last 24 hours before and after birth.

- Treatment should be given for 48-72 hours (at least 4 doses of Penicillin + 2 doses of gentamicin) and may be stopped if the baby has remained entirely well during this period.
- Where possible initiate laboratory investigations immediately but DO NOT withhold antibiotics.
- If there are no risk factors then DO NOT initiate antibiotics treatment.
- A well baby born preterm < 37 wks or Low birth weight with low risk factors does not require antibiotic treatment.

Newborn antibiotic doses

Intravenous / intramuscular antibiotics aged ≤ 7 days

Weight (kg)	Penicillin (50,000iu/kg) IV / IM 12 hrly	Ampicillin / Flucloxacillin (50mg/kg) IV / IM 12 hrly	Gentamicin (3mg/kg <2kg, 5mg/kg ≥ 2kg) IV / IM 24 hrly	Ceftriaxone (50mg/kg) IV / IM 24 hrly	Metronidazole (7.5mg/kg) IV 12 hrly
1.00	50,000	50	3	50	7.5
1.25	75,000	60	4	62.5	10
1.50	75,000	75	5	75	12.5
1.75	100,000	85	6	75	12.5
2.00	100,000	100	10	100	15
2.50	150,000	125	12.5	125	20
3.00	150,000	150	15	150	22.5
4.00	200,000	200	20	200	30

Oral amoxicillin - 50mg/kg/dose twice a day (100mg/kg/d in two divided doses)

Ophthalmia Neonatorum:
Swollen red eyelids with pus should be treated with a single dose of:

- ✓ Kanamycin or Spectinomycin 25mg/kg (max 75mg) IM, or,
- ✓ Ceftriaxone 50mg/kg IM

Warning:

- ✓ **Gentamicin** – Please check the dose is **correct for weight and age in DAYS**
- ✓ **Gentamicin** used OD should **be given IM or as a slow IV push over** 2-3 mins.
- ✓ If a baby is not obviously passing urine after more than 24 hours consider stopping gentamicin.
- ✓ **Penicillin** dosing is **twice daily** in babies aged ≤ 7 days
- ✓ **Ceftriaxone** is not recommended in obviously jaundiced newborns – Cefotaxime/ ceftazidime are safer cephalosporins in the first 7 days of life

Neonatal Sepsis

Classification and treatment of Possible Serious Bacterial Infection (PSBI) Age<60 Days

Young infants 0-59 days old with clinically severe infection whose families do not accept or cannot access referral care should be managed in outpatient settings by an appropriately trained health worker

Classification	Clinical Features	Management
Critical illness	• Unconscious • Convulsions • Unable to feed at all • Apnoea • Unable to cry • Cyanosis • Bulging fontanelle • Major congenital malformations inhibiting oral antibiotic intake • Active bleeding requiring transfusion • Surgical conditions needing hospital referral • Persistent vomiting	• Give first dose benzylpenicillin and gentamicin • Keep warm • Initiate feeding EBM via NGT or IVF • Administer Vitamin K if not previously given • Prepare to urgently refer to hospital
Clinical Severe infection	• Movement only on stimulation • Not feeding well on observation • Temperature ≥ 38°C or <35.5°C • Severe chest wall in-drawing	• Gentamicin injection* once daily for 7 days AND oral amoxicillin twice daily for 7days • Counsel the mother to continue exclusive breastfeeding or EBM • Advice mother when to return
Fast breathing Pneumonia	Only sign is fast breathing ≥60 breaths /min	• Oral amoxicillin twice daily for 7 days • Counsel the mother to continue exclusive breastfeeding or EBM • Advice mother when to return

*Dosage of the antibiotics given for clinical severe infection and/or fast breathing pneumonia:
1. Gentamicin injection - IM 5 - 7.5mg/kg (for low-birth-weight infants 3 - 4mg/kg)
2. Oral amoxicillin - 50mg/kg per dose PO 12hrly

WEIGHT-FOR-LENGTH FROM BIRTH TO 2 YEARS: BOYS

Calculating a childs weight for length or height

In the tables:

- Locate the appropriate table for boys or girls.
- Locate the row containing the childs length in the left column.
- Note where the childs weight lies with respect to the lengths recorded in this row.
- Look up the column to read the weight-for-length of the child.

Example 1: Boy: length 61 cm, weight 5.3 kg. His weight-for-length is 2 SD.
Example 2: Girl: length 67 cm, weight 4.3 kg. Her weight-for-length is < 3SD.

Table A5.2.1 Weight-for-length from birth to 2 years: Boys

Length (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
45.0	1.9	2.0	2.2	2.4	2.7	3.0	3.3
45.5	1.9	2.1	2.3	2.5	2.8	3.1	3.4
46.0	2.0	2.2	2.4	2.6	2.9	3.1	3.5
46.5	2.1	2.3	2.5	2.7	3.0	3.2	3.6
47.0	2.1	2.3	2.5	2.8	3.0	3.3	3.7
47.5	2.2	2.4	2.6	2.9	3.1	3.4	3.8
48.0	2.3	2.5	2.7	2.9	3.2	3.6	3.9
48.5	2.3	2.6	2.8	3.0	3.3	3.7	4.0

[1] Gorstein J et al. Issues in the assessment of nutritional status using anthropometry. *Bulletin of the World Health Organization*, 1994, 72:273283.

Weight Height Reference Tables

WEIGHT-FOR-LENGTH FROM BIRTH TO 2 YEARS: BOYS

Length (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
49.0	2.4	2.6	2.9	3.1	3.4	3.8	4.2
49.5	2.5	2.7	3.0	3.2	3.5	3.9	4.3
50.0	2.6	2.8	3.0	3.3	3.6	4.0	4.4
50.5	2.7	2.9	3.1	3.4	3.8	4.1	4.5
51.0	2.7	3.0	3.2	3.5	3.9	4.2	4.7
51.5	2.8	3.1	3.3	3.6	4.0	4.4	4.8
52.0	2.9	3.2	3.5	3.8	4.1	4.5	5.0
52.5	3.0	3.3	3.6	3.9	4.2	4.6	5.1
53.0	3.1	3.4	3.7	4.0	4.4	4.8	5.3
53.5	3.2	3.5	3.8	4.1	4.5	4.9	5.4
54.0	3.3	3.6	3.9	4.3	4.7	5.1	5.6
54.5	3.4	3.7	4.0	4.4	4.8	5.3	5.8
55.0	3.6	3.8	4.2	4.5	5.0	5.4	6.0
55.5	3.7	4.0	4.3	4.7	5.1	5.6	6.1
56.0	3.8	4.1	4.4	4.8	5.3	5.8	6.3
56.5	3.9	4.2	4.6	5.0	5.4	5.9	6.5
57.0	4.0	4.3	4.7	5.1	5.6	6.1	6.7
57.5	4.1	4.5	4.9	5.3	5.7	6.3	6.9
58.0	4.3	4.6	5.0	5.4	5.9	6.4	7.1
58.5	4.4	4.7	5.1	5.6	6.1	6.6	7.2
59.0	4.5	4.8	5.3	5.7	6.2	6.8	7.4
59.5	4.6	5.0	5.4	5.9	6.4	7.0	7.6
60.0	4.7	5.1	5.5	6.0	6.5	7.1	7.8
60.5	4.8	5.2	5.6	6.1	6.7	7.3	8.0
61.0	4.9	5.3	5.8	6.3	6.8	7.4	8.1
61.5	5.0	5.4	5.9	6.4	7.0	7.6	8.3
62.0	5.1	5.6	6.0	6.5	7.1	7.7	8.5
62.5	5.2	5.7	6.1	6.7	7.2	7.9	8.6
63.0	5.3	5.8	6.2	6.8	7.4	8.0	8.8
63.5	5.4	5.9	6.4	6.9	7.5	8.2	8.9
64.0	5.5	6.0	6.5	7.0	7.6	8.3	9.1

Weight Height Reference Tables

WEIGHT-FOR-LENGTH FROM BIRTH TO 2 YEARS: BOYS

Length (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
64.5	5.6	6.1	6.6	7.1	7.8	8.5	9.3
65.0	5.7	6.2	6.7	7.3	7.9	8.6	9.4
65.5	5.8	6.3	6.8	7.4	8.0	8.7	9.6
66.0	5.9	6.4	6.9	7.5	8.2	8.9	9.7
66.5	6.0	6.5	7.0	7.6	8.3	9.0	9.9
67.0	6.1	6.6	7.1	7.7	8.4	9.2	10.0
67.5	6.2	6.7	7.2	7.9	8.5	9.3	10.2
68.0	6.3	6.8	7.3	8.0	8.7	9.4	10.3
68.5	6.4	6.9	7.5	8.1	8.8	9.6	10.5
69.0	6.5	7.0	7.6	8.2	8.9	9.7	10.6
69.5	6.6	7.1	7.7	8.3	9.0	9.8	10.8
70.0	6.6	7.2	7.8	8.4	9.2	10.0	10.9
70.5	6.7	7.3	7.9	8.5	9.3	10.1	11.1
71.0	6.8	7.4	8.0	8.6	9.4	10.2	11.2
71.5	6.9	7.5	8.1	8.8	9.5	10.4	11.3
72.0	7.0	7.6	8.2	8.9	9.6	10.5	11.5
72.5	7.1	7.6	8.3	9.0	9.8	10.6	11.6
73.0	7.2	7.7	8.4	9.1	9.9	10.8	11.8
73.5	7.2	7.8	8.5	9.2	10.0	10.9	11.9
74.0	7.3	7.9	8.6	9.3	10.1	11.0	12.1
74.5	7.4	8.0	8.7	9.4	10.2	11.2	12.2
75.0	7.5	8.1	8.8	9.5	10.3	11.3	12.3
75.5	7.6	8.2	8.8	9.6	10.4	11.4	12.5
76.0	7.6	8.3	8.9	9.7	10.6	11.5	12.6
76.5	7.7	8.3	9.0	9.8	10.7	11.6	12.7
77.0	7.8	8.4	9.1	9.9	10.8	11.7	12.8
77.5	7.9	8.5	9.2	10.0	10.9	11.9	13.0
78.0	7.9	8.6	9.3	10.1	11.0	12.0	13.1
78.5	8.0	8.7	9.4	10.2	11.1	12.1	13.2
79.0	8.1	8.7	9.5	10.3	11.2	12.2	13.3
79.5	8.2	8.8	9.5	10.4	11.3	12.3	13.4

Weight Height Reference Tables

WEIGHT-FOR-LENGTH FROM BIRTH TO 2 YEARS: BOYS

Length (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
80.0	8.2	8.9	9.6	10.4	11.4	12.4	13.6
80.5	8.3	9.0	9.7	10.5	11.5	12.5	13.7
81.0	8.4	9.1	9.8	10.6	11.6	12.6	13.8
81.5	8.5	9.1	9.9	10.7	11.7	12.7	13.9
82.0	8.5	9.2	10.0	10.8	11.8	12.8	14.0
82.5	8.6	9.3	10.1	10.9	11.9	13.0	14.2
83.0	8.7	9.4	10.2	11.0	12.0	13.1	14.3
83.5	8.8	9.5	10.3	11.2	12.1	13.2	14.4
84.0	8.9	9.6	10.4	11.3	12.2	13.3	14.6
84.5	9.0	9.7	10.5	11.4	12.4	13.5	14.7
85.0	9.1	9.8	10.6	11.5	12.5	13.6	14.9
85.5	9.2	9.9	10.7	11.6	12.6	13.7	15.0
86.0	9.3	10.0	10.8	11.7	12.8	13.9	15.2
86.5	9.4	10.1	11.0	11.9	12.9	14.0	15.3
87.0	9.5	10.2	11.1	12.0	13.0	14.2	15.5
87.5	9.6	10.4	11.2	12.1	13.2	14.3	15.6
88.0	9.7	10.5	11.3	12.2	13.3	14.5	15.8
88.5	9.8	10.6	11.4	12.4	13.4	14.6	15.9
89.0	9.9	10.7	11.5	12.5	13.5	14.7	16.1
89.5	10.0	10.8	11.6	12.6	13.7	14.9	16.2
90.0	10.1	10.9	11.8	12.7	13.8	15.0	16.4
90.5	10.2	11.0	11.9	12.8	13.9	15.1	16.5
91.0	10.3	11.1	12.0	13.0	14.1	15.3	16.7
91.5	10.4	11.2	12.1	13.1	14.2	15.4	16.8
92.0	10.5	11.3	12.2	13.2	14.3	15.6	17.0
92.5	10.6	11.4	12.3	13.3	14.4	15.7	17.1
93.0	10.7	11.5	12.4	13.4	14.6	15.8	17.3
93.5	10.7	11.6	12.5	13.5	14.7	16.0	17.4
94.0	10.8	11.7	12.6	13.7	14.8	16.1	17.6
94.5	10.9	11.8	12.7	13.8	14.9	16.3	17.7
95.0	11.0	11.9	12.8	13.9	15.1	16.4	17.9

Length (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
95.5	11.1	12.0	12.9	14.0	15.2	16.5	18.0
96.0	11.2	12.1	13.1	14.1	15.3	16.7	18.2
96.5	11.3	12.2	13.2	14.3	15.5	16.8	18.4
97.0	11.4	12.3	13.3	14.4	15.6	17.0	18.5
97.5	11.5	12.4	13.4	14.5	15.7	17.1	18.7
98.0	11.6	12.5	13.5	14.6	15.9	17.3	18.9
98.5	11.7	12.6	13.6	14.8	16.0	17.5	19.1
99.0	11.8	12.7	13.7	14.9	16.2	17.6	19.2
99.5	11.9	12.8	13.9	15.0	16.3	17.8	19.4
100.0	12.0	12.9	14.0	15.2	16.5	18.0	19.6
100.5	12.1	13.0	14.1	15.3	16.6	18.1	19.8
101.0	12.2	13.2	14.2	15.4	16.8	18.3	20.0
101.5	12.3	13.3	14.4	15.6	16.9	18.5	20.2
102.0	12.4	13.4	14.5	15.7	17.1	18.7	20.4
102.5	12.5	13.5	14.6	15.9	17.3	18.8	20.6
103.0	12.6	13.6	14.8	16.0	17.4	19.0	20.8
103.5	12.7	13.7	14.9	16.2	17.6	19.2	21.0
104.0	12.8	13.9	15.0	16.3	17.8	19.4	21.2
104.5	12.9	14.0	15.2	16.5	17.9	19.6	21.5
105.0	13.0	14.1	15.3	16.6	18.1	19.8	21.7
105.5	13.2	14.2	15.4	16.8	18.3	20.0	21.9
106.0	13.3	14.4	15.6	16.9	18.5	20.2	22.1
106.5	13.4	14.5	15.7	17.1	18.6	20.4	22.4
107.0	13.5	14.6	15.9	17.3	18.8	20.6	22.6
107.5	13.6	14.7	16.0	17.4	19.0	20.8	22.8
108.0	13.7	14.9	16.2	17.6	19.2	21.0	23.1
108.5	13.8	15.0	16.3	17.8	19.4	21.2	23.3
109.0	14.0	15.1	16.5	17.9	19.6	21.4	23.6
109.5	14.1	15.3	16.6	18.1	19.8	21.7	23.8
110.0	14.2	15.4	16.8	18.3	20.0	21.9	24.1

Weight for length from birth to 2 years: Girls

Length (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
45.0	1.9	2.1	2.3	2.5	2.7	3.0	3.3
45.5	2.0	2.1	2.3	2.5	2.8	3.1	3.4
46.0	2.0	2.2	2.4	2.6	2.9	3.2	3.5
46.5	2.1	2.3	2.5	2.7	3.0	3.3	3.6
47.0	2.2	2.4	2.6	2.8	3.1	3.4	3.7
47.5	2.2	2.4	2.6	2.9	3.2	3.5	3.8
48.0	2.3	2.5	2.7	3.0	3.3	3.6	4.0
48.5	2.4	2.6	2.8	3.1	3.4	3.7	4.1
49.0	2.4	2.6	2.9	3.2	3.5	3.8	4.2
49.5	2.5	2.7	3.0	3.3	3.6	3.9	4.3
50.0	2.6	2.8	3.1	3.4	3.7	4.0	4.5
50.5	2.7	2.9	3.2	3.5	3.8	4.2	4.6
51.0	2.8	3.0	3.3	3.6	3.9	4.3	4.8
51.5	2.8	3.1	3.4	3.7	4.0	4.4	4.9
52.0	2.9	3.2	3.5	3.8	4.2	4.6	5.1
52.5	3.0	3.3	3.6	3.9	4.3	4.7	5.2
53.0	3.1	3.4	3.7	4.0	4.4	4.9	5.4
53.5	3.2	3.5	3.8	4.2	4.6	5.0	5.5
54.0	3.3	3.6	3.9	4.3	4.7	5.2	5.7
54.5	3.4	3.7	4.0	4.4	4.8	5.3	5.9
55.0	3.5	3.8	4.2	4.5	5.0	5.5	6.1
55.5	3.6	3.9	4.3	4.7	5.1	5.7	6.3
56.0	3.7	4.0	4.4	4.8	5.3	5.8	6.4
56.5	3.8	4.1	4.5	5.0	5.4	6.0	6.6
57.0	3.9	4.3	4.6	5.1	5.6	6.1	6.8
57.5	4.0	4.4	4.8	5.2	5.7	6.3	7.0
58.0	4.1	4.5	4.9	5.4	5.9	6.5	7.1
58.5	4.2	4.6	5.0	5.5	6.0	6.6	7.3
59.0	4.3	4.7	5.1	5.6	6.2	6.8	7.5
59.5	4.4	4.8	5.3	5.7	6.3	6.9	7.7

Weight Height Reference Tables

WEIGHT-FOR-LENGTH FROM BIRTH TO 2 YEARS: BOYS

Length (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
60.0	4.5	4.9	5.4	5.9	6.4	7.1	7.8
60.5	4.6	5.0	5.5	6.0	6.6	7.3	8.0
61.0	4.7	5.1	5.6	6.1	6.7	7.4	8.2
61.5	4.8	5.2	5.7	6.3	6.9	7.6	8.4
62.0	4.9	5.3	5.8	6.4	7.0	7.7	8.5
62.5	5.0	5.4	5.9	6.5	7.1	7.8	8.7
63.0	5.1	5.5	6.0	6.6	7.3	8.0	8.8
63.5	5.2	5.6	6.2	6.7	7.4	8.1	9.0
64.0	5.3	5.7	6.3	6.9	7.5	8.3	9.1
64.5	5.4	5.8	6.4	7.0	7.6	8.4	9.3
65.0	5.5	5.9	6.5	7.1	7.8	8.6	9.5
65.5	5.5	6.0	6.6	7.2	7.9	8.7	9.6
66.0	5.6	6.1	6.7	7.3	8.0	8.8	9.8
66.5	5.7	6.2	6.8	7.4	8.1	9.0	9.9
67.0	5.8	6.3	6.9	7.5	8.3	9.1	10.0
67.5	5.9	6.4	7.0	7.6	8.4	9.2	10.2
68.0	6.0	6.5	7.1	7.7	8.5	9.4	10.3
68.5	6.1	6.6	7.2	7.9	8.6	9.5	10.5
69.0	6.1	6.7	7.3	8.0	8.7	9.6	10.6
69.5	6.2	6.8	7.4	8.1	8.8	9.7	10.7
70.0	6.3	6.9	7.5	8.2	9.0	9.9	10.9
70.5	6.4	6.9	7.6	8.3	9.1	10.0	11.0
71.0	6.5	7.0	7.7	8.4	9.2	10.1	11.1
71.5	6.5	7.1	7.7	8.5	9.3	10.2	11.3
72.0	6.6	7.2	7.8	8.6	9.4	10.3	11.4
72.5	6.7	7.3	7.9	8.7	9.5	10.5	11.5
73.0	6.8	7.4	8.0	8.8	9.6	10.6	11.7
73.5	6.9	7.4	8.1	8.9	9.7	10.7	11.8
74.0	6.9	7.5	8.2	9.0	9.8	10.8	11.9
74.5	7.0	7.6	8.3	9.1	9.9	10.9	12.0
75.0	7.1	7.7	8.4	9.1	10.0	11.0	12.2

Weight Height Reference Tables

WEIGHT-FOR-LENGTH FROM BIRTH TO 2 YEARS: BOYS

Length (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
75.5	7.1	7.8	8.5	9.2	10.1	11.1	12.3
76.0	7.2	7.8	8.5	9.3	10.2	11.2	12.4
76.5	7.3	7.9	8.6	9.4	10.3	11.4	12.5
77.0	7.4	8.0	8.7	9.5	10.4	11.5	12.6
77.5	7.4	8.1	8.8	9.6	10.5	11.6	12.8
78.0	7.5	8.2	8.9	9.7	10.6	11.7	12.9
78.5	7.6	8.2	9.0	9.8	10.7	11.8	13.0
79.0	7.7	8.3	9.1	9.9	10.8	11.9	13.1
79.5	7.7	8.4	9.1	10.0	10.9	12.0	13.3
80.0	7.8	8.5	9.2	10.1	11.0	12.1	13.4
80.5	7.9	8.6	9.3	10.2	11.2	12.3	13.5
81.0	8.0	8.7	9.4	10.3	11.3	12.4	13.7
81.5	8.1	8.8	9.5	10.4	11.4	12.5	13.8
82.0	8.1	8.8	9.6	10.5	11.5	12.6	13.9
82.5	8.2	8.9	9.7	10.6	11.6	12.8	14.1
83.0	8.3	9.0	9.8	10.7	11.8	12.9	14.2
83.5	8.4	9.1	9.9	10.9	11.9	13.1	14.4
84.0	8.5	9.2	10.1	11.0	12.0	13.2	14.5
84.5	8.6	9.3	10.2	11.1	12.1	13.3	14.7
85.0	8.7	9.4	10.3	11.2	12.3	13.5	14.9
85.5	8.8	9.5	10.4	11.3	12.4	13.6	15.0
86.0	8.9	9.7	10.5	11.5	12.6	13.8	15.2
86.5	9.0	9.8	10.6	11.6	12.7	13.9	15.4
87.0	9.1	9.9	10.7	11.7	12.8	14.1	15.5
87.5	9.2	10.0	10.9	11.8	13.0	14.2	15.7
88.0	9.3	10.1	11.0	12.0	13.1	14.4	15.9
88.5	9.4	10.2	11.1	12.1	13.2	14.5	16.0
89.0	9.5	10.3	11.2	12.2	13.4	14.7	16.2
89.5	9.6	10.4	11.3	12.3	13.5	14.8	16.4
90.0	9.7	10.5	11.4	12.5	13.7	15.0	16.5
90.5	9.8	10.6	11.5	12.6	13.8	15.1	16.7

Weight Height Reference Tables

WEIGHT-FOR-LENGTH FROM BIRTH TO 2 YEARS: BOYS

Length (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
91.0	9.9	10.7	11.7	12.7	13.9	15.3	16.9
91.5	10.0	10.8	11.8	12.8	14.1	15.5	17.0
92.0	10.1	10.9	11.9	13.0	14.2	15.6	17.2
92.5	10.1	11.0	12.0	13.1	14.3	15.8	17.4
93.0	10.2	11.1	12.1	13.2	14.5	15.9	17.5
93.5	10.3	11.2	12.2	13.3	14.6	16.1	17.7
94.0	10.4	11.3	12.3	13.5	14.7	16.2	17.9
94.5	10.5	11.4	12.4	13.6	14.9	16.4	18.0
95.0	10.6	11.5	12.6	13.7	15.0	16.5	18.2
95.5	10.7	11.6	12.7	13.8	15.2	16.7	18.4
96.0	10.8	11.7	12.8	14.0	15.3	16.8	18.6
96.5	10.9	11.8	12.9	14.1	15.4	17.0	18.7
97.0	11.0	12.0	13.0	14.2	15.6	17.1	18.9
97.5	11.1	12.1	13.1	14.4	15.7	17.3	19.1
98.0	11.2	12.2	13.3	14.5	15.9	17.5	19.3
98.5	11.3	12.3	13.4	14.6	16.0	17.6	19.5
99.0	11.4	12.4	13.5	14.8	16.2	17.8	19.6
99.5	11.5	12.5	13.6	14.9	16.3	18.0	19.8
100.0	11.6	12.6	13.7	15.0	16.5	18.1	20.0
100.5	11.7	12.7	13.9	15.2	16.6	18.3	20.2
101.0	11.8	12.8	14.0	15.3	16.8	18.5	20.4
101.5	11.9	13.0	14.1	15.5	17.0	18.7	20.6
102.0	12.0	13.1	14.3	15.6	17.1	18.9	20.8
102.5	12.1	13.2	14.4	15.8	17.3	19.0	21.0
103.0	12.3	13.3	14.5	15.9	17.5	19.2	21.3
103.5	12.4	13.5	14.7	16.1	17.6	19.4	21.5
104.0	12.5	13.6	14.8	16.2	17.8	19.6	21.7
104.5	12.6	13.7	15.0	16.4	18.0	19.8	21.9
105.0	12.7	13.8	15.1	16.5	18.2	20.0	22.2
105.5	12.8	14.0	15.3	16.7	18.4	20.2	22.4
106.0	13.0	14.1	15.4	16.9	18.5	20.5	22.6

Length (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
106.5	13.1	14.3	15.6	17.1	18.7	20.7	22.9
107.0	13.2	14.4	15.7	17.2	18.9	20.9	23.1
107.5	13.3	14.5	15.9	17.4	19.1	21.1	23.4
108.0	13.5	14.7	16.0	17.6	19.3	21.3	23.6
108.5	13.6	14.8	16.2	17.8	19.5	21.6	23.9
109.0	13.7	15.0	16.4	18.0	19.7	21.8	24.2
109.5	13.9	15.1	16.5	18.1	20.0	22.0	24.4
110.0	14.0	15.3	16.7	18.3	20.2	22.3	24.7

Weight for height from 2 to 5 years: Boys

Height (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
65.0	5.9	6.3	6.9	7.4	8.1	8.8	9.6
65.5	6.0	6.4	7.0	7.6	8.2	8.9	9.8
66.0	6.1	6.5	7.1	7.7	8.3	9.1	9.9
66.5	6.1	6.6	7.2	7.8	8.5	9.2	10.1
67.0	6.2	6.7	7.3	7.9	8.6	9.4	10.2
67.5	6.3	6.8	7.4	8.0	8.7	9.5	10.4
68.0	6.4	6.9	7.5	8.1	8.8	9.6	10.5
68.5	6.5	7.0	7.6	8.2	9.0	9.8	10.7
69.0	6.6	7.1	7.7	8.4	9.1	9.9	10.8
69.5	6.7	7.2	7.8	8.5	9.2	10.0	11.0
70.0	6.8	7.3	7.9	8.6	9.3	10.2	11.1
70.5	6.9	7.4	8.0	8.7	9.5	10.3	11.3
71.0	6.9	7.5	8.1	8.8	9.6	10.4	11.4
71.5	7.0	7.6	8.2	8.9	9.7	10.6	11.6
72.0	7.1	7.7	8.3	9.0	9.8	10.7	11.7
72.5	7.2	7.8	8.4	9.1	9.9	10.8	11.8
73.0	7.3	7.9	8.5	9.2	10.0	11.0	12.0
73.5	7.4	7.9	8.6	9.3	10.2	11.1	12.1
74.0	7.4	8.0	8.7	9.4	10.3	11.2	12.2
74.5	7.5	8.1	8.8	9.5	10.4	11.3	12.4

Weight Height Reference Tables

WEIGHT-FOR-HEIGHT FROM 2 TO 5 YEARS: BOYS

Height (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
75.0	7.6	8.2	8.9	9.6	10.5	11.4	12.5
75.5	7.7	8.3	9.0	9.7	10.6	11.6	12.6
76.0	7.7	8.4	9.1	9.8	10.7	11.7	12.8
76.5	7.8	8.5	9.2	9.9	10.8	11.8	12.9
77.0	7.9	8.5	9.2	10.0	10.9	11.9	13.0
77.5	8.0	8.6	9.3	10.1	11.0	12.0	13.1
78.0	8.0	8.7	9.4	10.2	11.1	12.1	13.3
78.5	8.1	8.8	9.5	10.3	11.2	12.2	13.4
79.0	8.2	8.8	9.6	10.4	11.3	12.3	13.5
79.5	8.3	8.9	9.7	10.5	11.4	12.4	13.6
80.0	8.3	9.0	9.7	10.6	11.5	12.6	13.7
80.5	8.4	9.1	9.8	10.7	11.6	12.7	13.8
81.0	8.5	9.2	9.9	10.8	11.7	12.8	14.0
81.5	8.6	9.3	10.0	10.9	11.8	12.9	14.1
82.0	8.7	9.3	10.1	11.0	11.9	13.0	14.2
82.5	8.7	9.4	10.2	11.1	12.1	13.1	14.4
83.0	8.8	9.5	10.3	11.2	12.2	13.3	14.5
83.5	8.9	9.6	10.4	11.3	12.3	13.4	14.6
84.0	9.0	9.7	10.5	11.4	12.4	13.5	14.8
84.5	9.1	9.9	10.7	11.5	12.5	13.7	14.9
85.0	9.2	10.0	10.8	11.7	12.7	13.8	15.1
85.5	9.3	10.1	10.9	11.8	12.8	13.9	15.2
86.0	9.4	10.2	11.0	11.9	12.9	14.1	15.4
86.5	9.5	10.3	11.1	12.0	13.1	14.2	15.5
87.0	9.6	10.4	11.2	12.2	13.2	14.4	15.7
87.5	9.7	10.5	11.3	12.3	13.3	14.5	15.8
88.0	9.8	10.6	11.5	12.4	13.5	14.7	16.0
88.5	9.9	10.7	11.6	12.5	13.6	14.8	16.1
89.0	10.0	10.8	11.7	12.6	13.7	14.9	16.3
89.5	10.1	10.9	11.8	12.8	13.9	15.1	16.4
90.0	10.2	11.0	11.9	12.9	14.0	15.2	16.6

Weight Height Reference Tables

WEIGHT-FOR-HEIGHT FROM 2 TO 5 YEARS: BOYS

Height (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
90.5	10.3	11.1	12.0	13.0	14.1	15.3	16.7
91.0	10.4	11.2	12.1	13.1	14.2	15.5	16.9
91.5	10.5	11.3	12.2	13.2	14.4	15.6	17.0
92.0	10.6	11.4	12.3	13.4	14.5	15.8	17.2
92.5	10.7	11.5	12.4	13.5	14.6	15.9	17.3
93.0	10.8	11.6	12.6	13.6	14.7	16.0	17.5
93.5	10.9	11.7	12.7	13.7	14.9	16.2	17.6
94.0	11.0	11.8	12.8	13.8	15.0	16.3	17.8
94.5	11.1	11.9	12.9	13.9	15.1	16.5	17.9
95.0	11.1	12.0	13.0	14.1	15.3	16.6	18.1
95.5	11.2	12.1	13.1	14.2	15.4	16.7	18.3
96.0	11.3	12.2	13.2	14.3	15.5	16.9	18.4
96.5	11.4	12.3	13.3	14.4	15.7	17.0	18.6
97.0	11.5	12.4	13.4	14.6	15.8	17.2	18.8
97.5	11.6	12.5	13.6	14.7	15.9	17.4	18.9
98.0	11.7	12.6	13.7	14.8	16.1	17.5	19.1
98.5	11.8	12.8	13.8	14.9	16.2	17.7	19.3
99.0	11.9	12.9	13.9	15.1	16.4	17.9	19.5
99.5	12.0	13.0	14.0	15.2	16.5	18.0	19.7
100.0	12.1	13.1	14.2	15.4	16.7	18.2	19.9
100.5	12.2	13.2	14.3	15.5	16.9	18.4	20.1
101.0	12.3	13.3	14.4	15.6	17.0	18.5	20.3
101.5	12.4	13.4	14.5	15.8	17.2	18.7	20.5
102.0	12.5	13.6	14.7	15.9	17.3	18.9	20.7
102.5	12.6	13.7	14.8	16.1	17.5	19.1	20.9
103.0	12.8	13.8	14.9	16.2	17.7	19.3	21.1
103.5	12.9	13.9	15.1	16.4	17.8	19.5	21.3
104.0	13.0	14.0	15.2	16.5	18.0	19.7	21.6
104.5	13.1	14.2	15.4	16.7	18.2	19.9	21.8
105.0	13.2	14.3	15.5	16.8	18.4	20.1	22.0
105.5	13.3	14.4	15.6	17.0	18.5	20.3	22.2

Weight Height Reference Tables

WEIGHT-FOR-HEIGHT FROM 2 TO 5 YEARS: BOYS

Height (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
106.0	13.4	14.5	15.8	17.2	18.7	20.5	22.5
106.5	13.5	14.7	15.9	17.3	18.9	20.7	22.7
107.0	13.7	14.8	16.1	17.5	19.1	20.9	22.9
107.5	13.8	14.9	16.2	17.7	19.3	21.1	23.2
108.0	13.9	15.1	16.4	17.8	19.5	21.3	23.4
108.5	14.0	15.2	16.5	18.0	19.7	21.5	23.7
109.0	14.1	15.3	16.7	18.2	19.8	21.8	23.9
109.5	14.3	15.5	16.8	18.3	20.0	22.0	24.2
110.0	14.4	15.6	17.0	18.5	20.2	22.2	24.4
110.5	14.5	15.8	17.1	18.7	20.4	22.4	24.7
111.0	14.6	15.9	17.3	18.9	20.7	22.7	25.0
111.5	14.8	16.0	17.5	19.1	20.9	22.9	25.2
112.0	14.9	16.2	17.6	19.2	21.1	23.1	25.5
112.5	15.0	16.3	17.8	19.4	21.3	23.4	25.8
113.0	15.2	16.5	18.0	19.6	21.5	23.6	26.0
113.5	15.3	16.6	18.1	19.8	21.7	23.9	26.3
114.0	15.4	16.8	18.3	20.0	21.9	24.1	26.6
114.5	15.6	16.9	18.5	20.2	22.1	24.4	26.9
115.0	15.7	17.1	18.6	20.4	22.4	24.6	27.2
115.5	15.8	17.2	18.8	20.6	22.6	24.9	27.5
116.0	16.0	17.4	19.0	20.8	22.8	25.1	27.8
116.5	16.1	17.5	19.2	21.0	23.0	25.4	28.0
117.0	16.2	17.7	19.3	21.2	23.3	25.6	28.3
117.5	16.4	17.9	19.5	21.4	23.5	25.9	28.6
118.0	16.5	18.0	19.7	21.6	23.7	26.1	28.9
118.5	16.7	18.2	19.9	21.8	23.9	26.4	29.2
119.0	16.8	18.3	20.0	22.0	24.1	26.6	29.5
119.5	16.9	18.5	20.2	22.2	24.4	26.9	29.8
120.0	17.1	18.6	20.4	22.4	24.6	27.2	30.1

Weight for height from 2 to 5 years: Girls

Height (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
65.0	5.6	6.1	6.6	7.2	7.9	8.7	9.7
65.5	5.7	6.2	6.7	7.4	8.1	8.9	9.8
66.0	5.8	6.3	6.8	7.5	8.2	9.0	10.0
66.5	5.8	6.4	6.9	7.6	8.3	9.1	10.1
67.0	5.9	6.4	7.0	7.7	8.4	9.3	10.2
67.5	6.0	6.5	7.1	7.8	8.5	9.4	10.4
68.0	6.1	6.6	7.2	7.9	8.7	9.5	10.5
68.5	6.2	6.7	7.3	8.0	8.8	9.7	10.7
69.0	6.3	6.8	7.4	8.1	8.9	9.8	10.8
69.5	6.3	6.9	7.5	8.2	9.0	9.9	10.9
70.0	6.4	7.0	7.6	8.3	9.1	10.0	11.1
70.5	6.5	7.1	7.7	8.4	9.2	10.1	11.2
71.0	6.6	7.1	7.8	8.5	9.3	10.3	11.3
71.5	6.7	7.2	7.9	8.6	9.4	10.4	11.5
72.0	6.7	7.3	8.0	8.7	9.5	10.5	11.6
72.5	6.8	7.4	8.1	8.8	9.7	10.6	11.7
73.0	6.9	7.5	8.1	8.9	9.8	10.7	11.8
73.5	7.0	7.6	8.2	9.0	9.9	10.8	12.0
74.0	7.0	7.6	8.3	9.1	10.0	11.0	12.1
74.5	7.1	7.7	8.4	9.2	10.1	11.1	12.2
75.0	7.2	7.8	8.5	9.3	10.2	11.2	12.3
75.5	7.2	7.9	8.6	9.4	10.3	11.3	12.5
76.0	7.3	8.0	8.7	9.5	10.4	11.4	12.6
76.5	7.4	8.0	8.7	9.6	10.5	11.5	12.7
77.0	7.5	8.1	8.8	9.6	10.6	11.6	12.8
77.5	7.5	8.2	8.9	9.7	10.7	11.7	12.9
78.0	7.6	8.3	9.0	9.8	10.8	11.8	13.1
78.5	7.7	8.4	9.1	9.9	10.9	12.0	13.2
79.0	7.8	8.4	9.2	10.0	11.0	12.1	13.3
79.5	7.8	8.5	9.3	10.1	11.1	12.2	13.4

Weight Height Reference Tables

WEIGHT-FOR-HEIGHT FROM 2 TO 5 YEARS: BOYS

Height (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
80.0	7.9	8.6	9.4	10.2	11.2	12.3	13.6
80.5	8.0	8.7	9.5	10.3	11.3	12.4	13.7
81.0	8.1	8.8	9.6	10.4	11.4	12.6	13.9
81.5	8.2	8.9	9.7	10.6	11.6	12.7	14.0
82.0	8.3	9.0	9.8	10.7	11.7	12.8	14.1
82.5	8.4	9.1	9.9	10.8	11.8	13.0	14.3
83.0	8.5	9.2	10.0	10.9	11.9	13.1	14.5
83.5	8.5	9.3	10.1	11.0	12.1	13.3	14.6
84.0	8.6	9.4	10.2	11.1	12.2	13.4	14.8
84.5	8.7	9.5	10.3	11.3	12.3	13.5	14.9
85.0	8.8	9.6	10.4	11.4	12.5	13.7	15.1
85.5	8.9	9.7	10.6	11.5	12.6	13.8	15.3
86.0	9.0	9.8	10.7	11.6	12.7	14.0	15.4
86.5	9.1	9.9	10.8	11.8	12.9	14.2	15.6
87.0	9.2	10.0	10.9	11.9	13.0	14.3	15.8
87.5	9.3	10.1	11.0	12.0	13.2	14.5	15.9
88.0	9.4	10.2	11.1	12.1	13.3	14.6	16.1
88.5	9.5	10.3	11.2	12.3	13.4	14.8	16.3
89.0	9.6	10.4	11.4	12.4	13.6	14.9	16.4
89.5	9.7	10.5	11.5	12.5	13.7	15.1	16.6
90.0	9.8	10.6	11.6	12.6	13.8	15.2	16.8
90.5	9.9	10.7	11.7	12.8	14.0	15.4	16.9
91.0	10.0	10.9	11.8	12.9	14.1	15.5	17.1
91.5	10.1	11.0	11.9	13.0	14.3	15.7	17.3
92.0	10.2	11.1	12.0	13.1	14.4	15.8	17.4
92.5	10.3	11.2	12.1	13.3	14.5	16.0	17.6
93.0	10.4	11.3	12.3	13.4	14.7	16.1	17.8
93.5	10.5	11.4	12.4	13.5	14.8	16.3	17.9
94.0	10.6	11.5	12.5	13.6	14.9	16.4	18.1
94.5	10.7	11.6	12.6	13.8	15.1	16.6	18.3
95.0	10.8	11.7	12.7	13.9	15.2	16.7	18.5

Weight Height Reference Tables

WEIGHT-FOR-HEIGHT FROM 2 TO 5 YEARS: BOYS

Height (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
95.5	10.8	11.8	12.8	14.0	15.4	16.9	18.6
96.0	10.9	11.9	12.9	14.1	15.5	17.0	18.8
96.5	11.0	12.0	13.1	14.3	15.6	17.2	19.0
97.0	11.1	12.1	13.2	14.4	15.8	17.4	19.2
97.5	11.2	12.2	13.3	14.5	15.9	17.5	19.3
98.0	11.3	12.3	13.4	14.7	16.1	17.7	19.5
98.5	11.4	12.4	13.5	14.8	16.2	17.9	19.7
99.0	11.5	12.5	13.7	14.9	16.4	18.0	19.9
99.5	11.6	12.7	13.8	15.1	16.5	18.2	20.1
100.0	11.7	12.8	13.9	15.2	16.7	18.4	20.3
100.5	11.9	12.9	14.1	15.4	16.9	18.6	20.5
101.0	12.0	13.0	14.2	15.5	17.0	18.7	20.7
101.5	12.1	13.1	14.3	15.7	17.2	18.9	20.9
102.0	12.2	13.3	14.5	15.8	17.4	19.1	21.1
102.5	12.3	13.4	14.6	16.0	17.5	19.3	21.4
103.0	12.4	13.5	14.7	16.1	17.7	19.5	21.6
103.5	12.5	13.6	14.9	16.3	17.9	19.7	21.8
104.0	12.6	13.8	15.0	16.4	18.1	19.9	22.0
104.5	12.8	13.9	15.2	16.6	18.2	20.1	22.3
105.0	12.9	14.0	15.3	16.8	18.4	20.3	22.5
105.5	13.0	14.2	15.5	16.9	18.6	20.5	22.7
106.0	13.1	14.3	15.6	17.1	18.8	20.8	23.0
106.5	13.3	14.5	15.8	17.3	19.0	21.0	23.2
107.0	13.4	14.6	15.9	17.5	19.2	21.2	23.5
107.5	13.5	14.7	16.1	17.7	19.4	21.4	23.7
108.0	13.7	14.9	16.3	17.8	19.6	21.7	24.0
108.5	13.8	15.0	16.4	18.0	19.8	21.9	24.3
109.0	13.9	15.2	16.6	18.2	20.0	22.1	24.5
109.5	14.1	15.4	16.8	18.4	20.3	22.4	24.8
110.0	14.2	15.5	17.0	18.6	20.5	22.6	25.1
110.5	14.4	15.7	17.1	18.8	20.7	22.9	25.4

Weight Height Reference Tables

WEIGHT-FOR-HEIGHT FROM 2 TO 5 YEARS: BOYS

Height (cm)	3SD	2SD	1SD	Median	1SD	2SD	3SD
111.0	14.5	15.8	17.3	19.0	20.9	23.1	25.7
111.5	14.7	16.0	17.5	19.2	21.2	23.4	26.0
112.0	14.8	16.2	17.7	19.4	21.4	23.6	26.2
112.5	15.0	16.3	17.9	19.6	21.6	23.9	26.5
113.0	15.1	16.5	18.0	19.8	21.8	24.2	26.8
113.5	15.3	16.7	18.2	20.0	22.1	24.4	27.1
114.0	15.4	16.8	18.4	20.2	22.3	24.7	27.4
114.5	15.6	17.0	18.6	20.5	22.6	25.0	27.8
115.0	15.7	17.2	18.8	20.7	22.8	25.2	28.1
115.5	15.9	17.3	19.0	20.9	23.0	25.5	28.4
116.0	16.0	17.5	19.2	21.1	23.3	25.8	28.7
116.5	16.2	17.7	19.4	21.3	23.5	26.1	29.0
117.0	16.3	17.8	19.6	21.5	23.8	26.3	29.3
117.5	16.5	18.0	19.8	21.7	24.0	26.6	29.6
118.0	16.6	18.2	19.9	22.0	24.2	26.9	29.9
118.5	16.8	18.4	20.1	22.2	24.5	27.2	30.3
119.0	16.9	18.5	20.3	22.4	24.7	27.4	30.6
119.5	17.1	18.7	20.5	22.6	25.0	27.7	30.9
120.0	17.3	18.9	20.7	22.8	25.2	28.0	31.2

All babies and children admitted to hospital should be weighed and the weight recorded in the medical record and in the MCH.

Estimate the weight from the age only if immediate life support is required or the patient is in shock - then check weight as soon as stabilised.

All other children should have weight measured.

Child looks well nourished, average size for age	**Estimated Weight** (kg)	If child looks obviously underweight – find age but step back 2 age /weight categories and use the weight appropriate for this younger age-group. Eg. Child thin and age 10 months, use the weight for a 4-6 month well nourished child. If there is severe malnutrition this chart will be inaccurate.
Age		
1 – 3 weeks	3.0	
4 - 7 weeks	4.0	
2 - 3 months	5.0	
4 - 6 months	7.0	
7 to 9 months	9.0	
10 to 12 months	10.0	
1 to 2 yrs	11.0	
2 to 3 yrs	13.0	
3 to 4 yrs	15.0	
4 to 5 yrs	17.0	

Notes

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BASIC PAEDIATRIC PROTOCOLS

February 2022

5th Edition

DRAFT