REPUBLIC OF KENYA

MINISTRY OF HEALTH

BASIC PAEDIATRIC PROTOCOLS

for ages up to 5 years

November 2022

5th Edition

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Acknowledgements

The development of this 5th edition of the Basic Paediatric 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 protocol. The review was done through a long process of consultation, teamwork and information gathering. It was spear headed by Dr. Issak Bashir, Head of Department, Family Health and led by Dr. Caroline Mwangi, Head Division of Neonatal and Child Health in consultation with the various paediatric 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, Prof. Grace Irimu (University of Nairobi), Prof. Ambrose Agweyu (KEMRI-Wellcome Trust), Dr. Joy Odhiambo (Kisumu), Dr. Maryanne Wachu (Bomet), Dr. Abdullahi Rashid (Wajir), Dr. Rachael Kanguha (Tharaka Nithi), Dr. Brenda Oeba (Nyamira), Dr. Emelda Manguro (Machakos), Alice Nyimbaye (Homabay), Jason Kiruja (KNH) and Beatrice Juma (Kisumu).

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Ministry of Health
November 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 a health facility.

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 of care. It will also be useful 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 aids 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.

These protocols do not cover all common paediatric problems, therefore be on the lookout for the unusual conditions and seek advice or refer the child promptly.

Dr Patrick Amoth (EBS)
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November 2022

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) A child who requires inpatient management should not be discharged against medical advice but should be transferred to another facility to continue appropriate care.

8) The response to treatment needs to be assessed. Severely ill children must be reviewed within the first 6 hours of admission and progress documented.

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

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

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

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

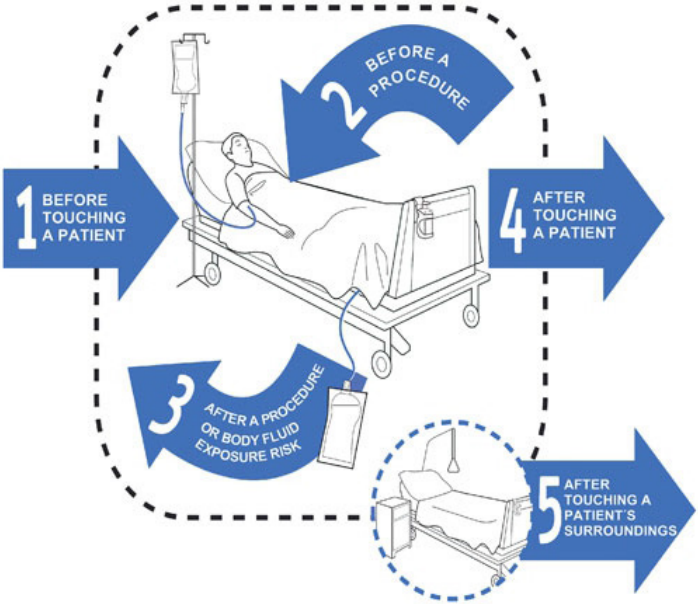
- All children and newborns admitted to hospital requiring medical treatment should have their own inpatient number, and admission should be recorded using a standardized paediatric or newborn admission record form & inpatient registers.
- Treatments, including supportive care, should be fully and clearly 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 HIV testing services and also be screened for TB.
- 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 infants and children should have a developmental assessment and those with special needs should be 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 and recorded including Temperature, Oxygen saturation, Pulse rates and Respiratory rates which must be counted for 1 minute, and Blood pressure.
- Consciousness 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.
- All sick children should have their blood glucose checked. If not possible and AVPU <A, 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 the current National IPC guidelines.

Hand hygiene technique

Duration of the entire procedure: 40-60 seconds

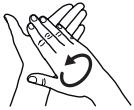
0

Wet hands with water;

1

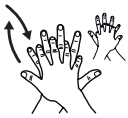
Apply enough soap to cover all hand surfaces;

2



Rub hands palm to palm;

3



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

4

Palm to palm with fingers interlaced;

5

Backs of fingers to opposing palms with fingers interlocked;

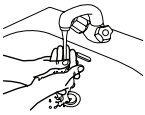
6

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

7

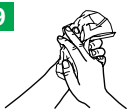
Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8



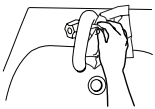
Rinse hands with water;

9



Dry hands thoroughly-with a single use towel;

10



Use towel to turn off faucet;

11

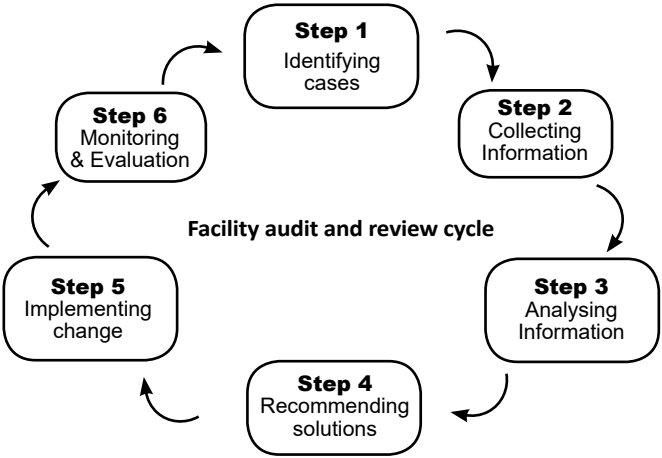
Your hands are now safe.

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 weekly 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 where available)

Airway

- Oropharyngeal airway
- Nasopharyngeal airway
- Laryngeal mask airway
- Endotracheal tubes*
- Suction devices
  - Functional suction machine
  - Penguin suckers
- Suction catheters of diferent sizes

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 with strips
- Pen torch
- Nasogastric tubes of different sizes

List of Essential Equipment (*for advanced care where available)

General

- 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
- Inelastic tape measure
- Otoscope
- Power source with backup

Essential Drugs

Doses (For overweight children, base dose calculation on median weight for age or height found on *page 79 - 97*)

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 make 10mls. i.e. 1mg in 10mls of solution.
Adrenaline *1 in 1000*	Severe viral croup 2ml of 1:1000 nebulized If effective, repeat with careful monitoring
Adrenaline *1 in 1000*	For anaphylaxis < 6years: 150micrograms IM (0.15ml)
Ampicillin	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 12 hourly
Amoxicillin	Use 25mg/kg/dose for simple infections and 40-45mg/kg for pneumonia *(Newborn Page 77, other ages Page 23)*
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
Budesonide	pMDI with a spacer 200 micrograms daily (low dose)

Doses (For overweight children, base dose calculation on median weight for age or height found on *page 79 - 97*)

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 77, other ages Page 22)*
Caffeine Citrate	Loading dose oral: 20 mg/kg (or IV over 30 min) maintenance followed 12-24 hours by maintenance dose 5 - 10mg/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/dose 2-3 times daily. *Avoid abrupt withdrawal and watch carefully for side effects*
Cefotaxime	If aged < 7days: Pre-term: 50mg/kg 12 hourly IV; Term and aged ≥ 7 days: 50mg/kg 8 hourly IV
Ceftazidime	Age < 7 days or weight < 1200g: 50 mg/kg IM/IV 12 hourly Age > 7 days or weight >1200g: 50 mg/kg IM/IV 8 hourly 1 mo - 12 yrs: 30 - 50 mg/kg IM/IV 8 hourly (Max: 6g/ day) (for pseudomonal infections)
Ceftriaxone	*Newborn Page 77, other Page 22*

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 23* 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 2 - 3 mins, *page 20* **Neonate**: 2 mls/kg
Diazepam (*IV*)	0.3 mg/kg & See separate chart *Page 20*
Diazepam (*rectal*)	0.5mg/kg & See separate chart *Page 20*
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
Erythromycin	30-50 mg/kg/day in 3-4 divided doses; max: 2g/day
Flucloxacillin	*Newborn Page 77, other Page 22 & 23*

Doses (For overweight children, base dose calculation on median weight for age or height found on *page 79 - 97)*

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 77, other Page 22*
Folic Acid	Preterms 2.5mg PO weekly
Hydroxyurea	*(For all children > 9 months of age with SCD)* Starting dose 20mg/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 PO 8 hourly
Iron (Fe)	**Iron deficiency anaemia**: Pre-term infant: 2 - 4mg elemental Fe/kg/day (max dose: 15mg elemental Fe/day) **Child:** 3 - 6mg elemental Fe/kg/day **Prophylaxis:** Pre-term infant 2mg elemental Fe/kg/24hr (max dose: 15mg elemental Fe/day) Term: 1 - 2mg elemental Fe/kg/24 hr (Max 15mg per day)
Lactulose	**Hepatic Encephalopathy Infants:** 1.7 - 6.7g/day (2.5-10mL) orally daily divided in 3 to 4 doses. Adjust dosage to produce 2 - 3 soft stools per day. **Children:** 25-60 g/day (40 - 90mL) orally daily divided in 3 - 4 doses. Adjust dosage to produce 2-3 soft stools/day. **Chronic constipation:** Children: 0.7 - 2gm/kg/day (1 to 3 mL/kg/day) orally in divided doses daily; not to exceed 40g/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)
Metronidazole	*Older Children Page 22 & 23. Newborn Page 77*
Midazolam *For management of convulsions*	Buccal: 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

Essential Drugs	**Doses** (For overweight children, base dose calculation on median weight for age or height found on *page 79 - 97)*
Morphine	**Neonate:** 0.05 - 0.2 mg/kg/dose IM, SC, slow IV every 4hr **Infant and Child:** PO 0.2 - 0.5mg/kg/dose every 4 - 6hr as needed IM/IV/SC 0.1 - 0.2mg/kg/dose every 2 - 4hrs as needed (Max 15mg/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 6hrly (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 36 & 37)*
Paracetamol	10 - 15mg/kg PO/IV 6 to 8 hrly (Max 75mg/kg/day)
Penicillin V	< 3years: 125mg twice daily > 3years: 250mg twice daily
Pethidine, IM	0.5 to 1mg/kg every 4 - 6hours
Phenobarbitone	Loading with 15mg/kg *(if NOT on maintenance phenobarb)* followed by 2.5mg - 5mg/kg daily. *Page 21*
Phenytoin	**Age 1m - 12yrs** (IV, oral) 15 - 20mg/kg at a rate not exceeding 1mg/kg/minute as a loading dose; maintenance dose of 2.5 - 5mg/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 48*)
Proguanil *Malaria prophylaxis in sickle cell disease*	<1 year: 25mg daily >1 year up to 5 years: 50mg daily
Quinine	*Page 33 and 34*

Doses (For overweight children, base dose calculation on median weight for age or height found on *page 79 - 97)*

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
< 2yrs: 5 microgram/kg, ≥ 2yrs up to 15microgram/kg (max 250 micrograms (0.25mg))
Nebulised: 2.5mg/dose as required *refer to page 48*
Inhaled *Acute exacerbation* 100 microgram per puff *see page 48*

TB Treatment

See page 50 and 51

Sodium Valproate

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

For status epilepticus
IV 30mg/kg over 5minutes

Vitamin A
Once on admission, not to be repeated within 1 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 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 PR dose is given at a depth of 4 - 5cm)				Glucose, 5mls/kg of 10% glucose over 2 - 3mins 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 water 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 5% Glucose:** **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 the NGT 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 78*)

Weight (kg)	Penicillin (50,000 iu/kg)	Flucloxacillin (50mg/kg)	Gentamicin (7.5mg/kg)	Ceftriaxone Max 50mg/kg 24hrly for neonates** Meningitis/ Severe Sepsis, 50mg/kg BD not to exceed 4g/day	Metronidazole (7.5mg/kg) not to exceed 4g/day
	IV/IM	IV / IM	IV / IM	IV/ IM	IV
	6hrly	8hrly	24hrly	50mg/kg	Age <1m: 12hrly Age ≥ 1m: 8hrly
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 77*)

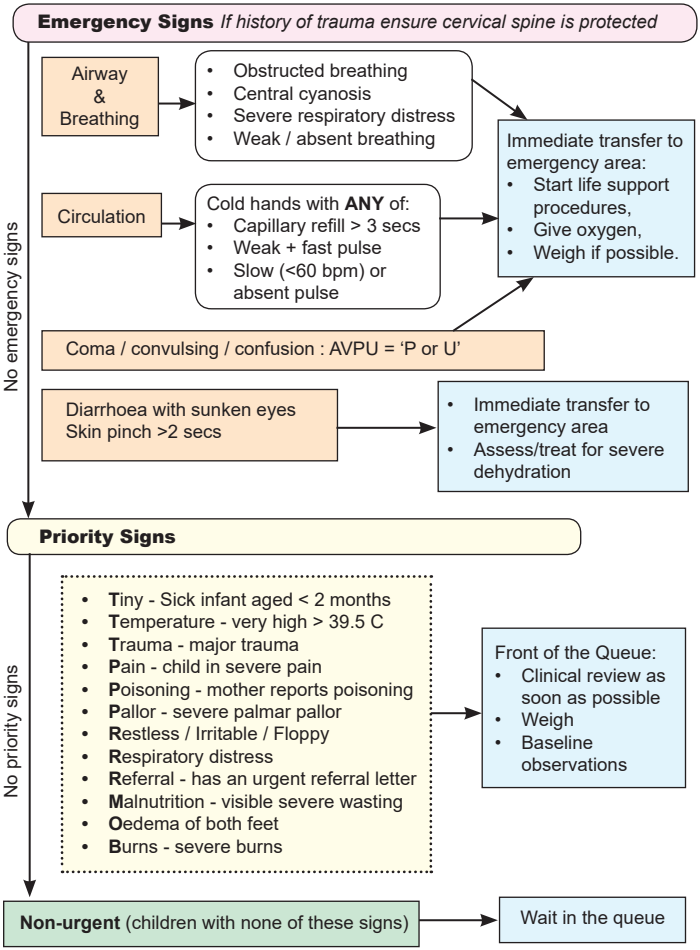
Weight (kg)	High dose Amoxicillin for pneumonia & severe infections 40 - 45mg/kg/dose			Amoxicillin (for mild infections) 25mg/kg/dose		Flucloxacillin 15mg/kg/dose		Ciprofloxacin 15mg/kg/dose (for 3 days)	Metronidazole 7.5mg/kg/dose
	12 hrly			12hrly		8hrly		12hrly	8hrly
	Syrup		D. Tab						
	125mg /5mls	250mg /5mls	250mg tabs	mls 125mg/5ml	250mg tabs	mls 125mg/5ml	250mg caps or tabs	250mg tabs	200mg tabs
3.0	5mls	2.5	½ tab	4		2.5	¼		
4.0	7.5mls	3.75		4		2.5	¼	¼	
5.0	10mls	5	1 tab	6		5	¼	¼	¼
6.0	10mls	5		6		5	½	¼	¼
7.0		7.5		8		5	½	½	½
8.0		7.5		8		5	½	½	½
9.0		7.5		8		5	½	½	½
10.0		10	2 tabs	12	1	5	1	½	½
11.0		10		12	1	10	1	1	½
12.0		10		12	1	10	1	1	½
13.0		12.5		12	1	10	1	1	½
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

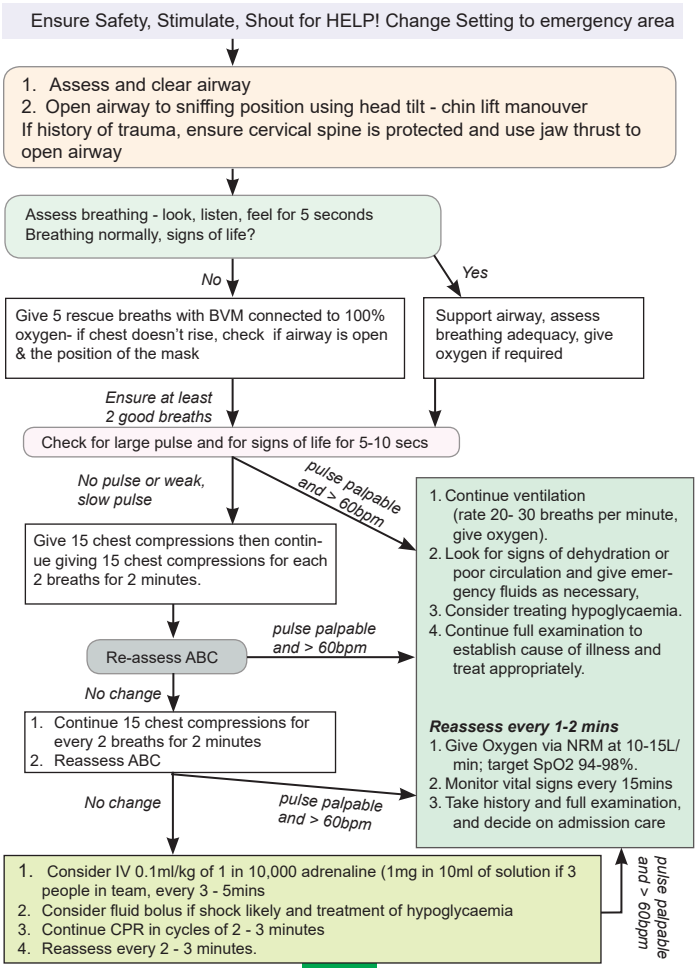
Initial Maintenance Fluids/Feeds
(Normal Renal function)

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


Emergency Signs If history of trauma ensure cervical spine is protected
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.
No emergency signs
Coma / convulsing / confusion : AVPU = 'P or U'
Diarrhoea with sunken eyes
Skin pinch >2 secs
• Immediate transfer to emergency area
• Assess/treat for severe dehydration
Priority Signs
• Tiny - Sick infant aged < 2 months
• Temperature - very high > 39.5 C
• Trauma - major trauma
• Pain - child in severe pain
• Poisoning - mother reports poisoning
• Pallor - severe palmar pallor
• Restless / Irritable / Floppy
• Respiratory distress
• Referral - has an urgent referral letter
• Malnutrition - visible severe wasting
• Oedema of both feet
• Burns - severe burns
Front of the Queue:
• Clinical review as soon as possible
• Weigh
• Baseline observations
No priority signs
Non-urgent (children with none of these signs)
Wait in the queue


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 manouver
If history of trauma, ensure cervical spine is protected and use jaw thrust to open airway
Assess breathing - look, listen, feel for 5 seconds
Breathing normally, signs of life?
No
Yes
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
Support airway, assess breathing adequacy, give oxygen if required
Ensure at least 2 good breaths
Check for large pulse and for signs of life for 5-10 secs
No pulse or weak, slow pulse
pulse palpable and > 60bpm
Give 15 chest compressions then continue giving 15 chest compressions for each 2 breaths for 2 minutes.
Re-assess ABC
pulse palpable and > 60bpm
No change
1. Continue 15 chest compressions for every 2 breaths for 2 minutes
2. Reassess ABC
No change
pulse palpable and > 60bpm
1. Continue ventilation (rate 20- 30 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 Oxygen via NRM at 10-15L/min; target SpO2 94-98%.
2. Monitor vital signs every 15mins
3. Take history and full examination, and decide on admission care
1. Consider IV 0.1ml/kg of 1 in 10,000 adrenaline (1mg in 10ml of solution if 3 people in team, every 3 - 5mins
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

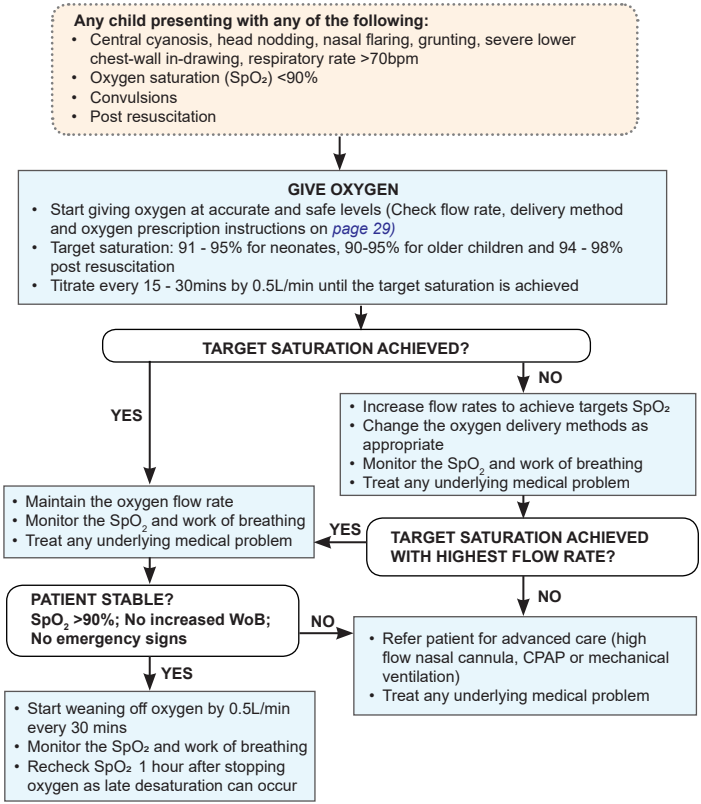
(without trauma assessment prior to a full history and examination)

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 SpO_2 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 min** 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. • 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**, organize immediate transfusion. As you await blood, give maintenance fluids/feeds ONLY *(check page 24)* • 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% Dextrose at 5mls/kg
E	• Expose	Do a quick head to toe exam. Note any abnormalities

Actions after ABCDE:

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

Hypoxeamia (SpO_2 <90%) can be assessed through clinical signs, pulse oximetry and blood gas analysis. It often presents in sick children and is a major risk factor for death regardless of the diagnosis.



Discharge only if child has been stable with SpO_2 ≥ 90% on room air and no increased work of breathing for at least 24 hrs.

Oxygen Administration Device.	Flow rate	Fraction of inspired Oxygen (FiO_2)
Nasal prong 	Standard Flow Rate: **Neonates:** 0.5 - 1 L/min **Infants:** 1 - 2 L min **Child:** 1 - 4 L min	Delivers **35%** O_2 to the patient.
	High Flow rate **Preterm Neonates:** 1L/min **Term neonates:** 2L/min **Infants:** 4 L/min **Child:** 4 - 8L/min	Delivers **50%** O_2 to patient
Nasal Catheter 	**Neonates:** Not recommended **Infants/child:** 1- 2L/min	Delivers **40%** O_2 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 O_2 concentration)	Delivers **80-95%** O_2 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 in a child in circulatiory compromise IO line is a rapid, safe & reliable route for obtaining blood samples and administration of drugs, fluids & blood.

- **Size** - use IO or bone marrow needle 15 - 18G if available or 16 - 21G hypodermic needle if not available
- **Sterility** - 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°)
  - 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 65*

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?

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

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 / refer appropriately

No

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

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 / refer appropriately

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 and treat cause / refer appropriately

- 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, levetiracetam and IV sodium valproate (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 BLOOD SLIDE** 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 ≤ 2.5mmol/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/dl 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.

Malaria treatment doses

For drug preparation refer to *page 34*

- **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 artemisinin 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)
Take after meals
Start at 0hr then at 8hr then 12hourly on day 2 and 3

Weight	Age	Dose
<5kg	-	1/2 tablet
5 - 14kg	3 - 35mo	1 tablet
15 - 24kg	3 - 7yrs	2 tablets
25 - 34kg	9 - 11yrs	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

Anti-malarial drug doses

(please check the IV or tablet preparation you are using, they may vary**)

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.*

Meningitis

Investigation

Age ≥ 60days 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

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 > $10x10^6$/L
- Gram positive diplococci or Gram negative cocco-bacilli

Treatment

No to all / *Yes to one*

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

+ LP looks clear

Yes to one → Classify **DEFINITE** meningitis:
1) Ceftriaxone
Steroids are not indicated

No to all / *Yes to one*

CSF Wbc + Gram stain result

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

All normal / *Test not done*

No meningitis

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

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 bolus over 15 minutes**
- 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

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 1
- IV Ringer's Lactate 30mls/kg
- Over 30mins if age ≥ 12m OR
- Over 60mins if age < 12m

Plan C Step 2
- IV Ringer's Lactate 70ml/kg
- Over 2.5hrs if age ≥ 12m OR
- Over 5hrs if age < 12m

Give ORS at 5mls/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 - 6hrs, 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			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

History
Polyuria, Polydipsia, Enuresis
Weight loss, Nausea, Vomiting, Abdominal pain, Reduced level of consciousness

Clinical signs:
Dehydration, Deep signing respiration (Kussmaul), fruity smelling breath, Lethargy/drowsiness

Biochemical features:
- Blood glucose ≥11.1mmol/l
- pH <7.3 or Bicarbonate <15mmol/l
- Ketones in urine ≥ 2+ or serum ketones ≥ 3mmol/L

Diagnosis of Diabetic Ketoacidosis confirmed
- Classify severity of DKA (**Severe** DKA pH<7.1, HCO3< 5mmol/L; **Moderate** DKA pH 7.1 - <7.2, HCO3 5 - <10mmol/L : **Mild** DKA pH 7.2 - <7.3 HCO3 10 - <15mmol/L)
- Assess and classify the level of dehydration.
- Senior review.

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

Dehydration >5%, Not in shock, Acidotic breathing or vomiting.

Minimal Dehydration and tolerating oral fluids

- Airway +/- NG tube
- Breathing - Give Oxygen
- via non-rebreather mask
- Circulation - 0.9% Normal Saline 10mls/kg over 30mins
- Do not give more than **40mls/kg within 4hours**

Resuscitation fluid: 0.9% Normal Saline 10mls/kg over 1hour

- Start subcutaneous regular insulin at 0.2iu/kg/dose every 4hours.
- Oral re-hydration

NO IMPROVEMENT AFTER 6 HOURS

- NPO
- Calculate fluid requirements over 48 hours. Refer to table on *page 40* for fluid requirements

AFTER FIRST HOUR of fluids:
- Start regular insulin by infusion:
  <5years: 0.03 - 0.05iu/kg/hr
  >5years: 0.05 - 0.1iu/kg/hr
  If infusion pump not available, dilute 50units regular insulin in 50ml normal saline, 1 unit =1ml
- Check potassium and add 20mmol of potassium per 500ml of fluid unless patient is anuric or has AKI.

Care continues on the next page

Diabetic Ketoacidosis Management

Ongoing Management

Critical observations:

- **Hourly** fluid input and output
- **Hourly** blood glucose
- Neurological status **at least hourly**
- Monitor ECG for T-wave changes
- Electrolytes and BGA **2 - 4 hourly** after starting IV fluid therapy

ACIDOSIS IMPROVING

If blood glucose 14 - 17mmol/L or blood glucose falls >5mmol/L/ hr change to 5% dextrose in 0.9% saline.

Resolution of DKA

- Clinically well, drinking well, tolerating food
- PH >7.3
- Serum ketones <1.0mmol/L

Transition to subcutaneous (SC) insulin

1. Calculate the total daily dose of insulin
   - Pre-pubertal 0.5 - 1 unit/kg/day
   - Pubertal 1 - 2 units/kg/day

   Give 30% of the total daily dose as long acting (glargine) 24 hourly or intermediate acting 12 hourly

   Give 70% as regular/ short acting divided into 3 equal doses before breakfast, lunch and dinner.
2. If transitioning using regular/ short-acting, give the calculated dose 30 minutes before a meal then stop IV insulin infusion after 30 minutes.
3. If transitioning using long acting or intermediate acting, give the calculated dose and stop IV insulin infusion after 2 hours
4. Monitor and record sugars 30 minutes before and 2 hours after breakfast, lunch and dinner.

NB: The dose can be adjusted based on blood sugar levels

NO IMPROVEMENT AFTER 6 HOURS

Re-evaluate:

- IV Fluid calculation
- Check ketones
- Insulin delivery system, dose and storage
- Need for additional resuscitation
- Consider sepsis

NEUROLOGICAL DETERIORATION

Warning signs

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

- Exclude hypoglycemia (RBS < 4mmol/L)
- Is it Celebral Oedema?

Management of Cerebral Oedema:

- Call Senior staff
- Prop head of bed at 30°
- Give oxygen
- Give Mannitol 0.5 - 1g/kg (max 200g) over 15 mins OR 3% hypertonic saline 2.5 - 5ml/kg over 15mins
- Restrict IV fluids to 70% of the total daily fluids
- Move to ICU/PICU
- Cranial imaging when stabilised

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

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

Fluid maintenance and replacement volumes based on body weight and an assumption of 10% dehydration

Body weight (kg)	Maintenance (ml/24 hours)	DKA: give maintenance + 5% of body weight/24 hours	
		ml/24 hours	ml/hour
4	325	530	22
5	405	650	27
6	485	790	33
7	570	920	38
8	640	1040	43
9	710	1160	48
10	780	1280	53
11	840	1390	58
12	890	1490	62
13	940	1590	66
14	990	1690	70
15	1030	1780	74
16	1070	1870	78
17	1120	1970	82
18	1150	2050	85
19	1190	2140	89
20	1230	2230	93
22	1300	2400	100
24	1360	2560	107
26	1430	2730	114
28	1490	2890	120
30	1560	3060	128
32	1620	3220	134
34	1680	3360	140
36	1730	3460	144
38	1790	3580	149
40	1850	3700	154
45	1980	3960	165
50	2100	4200	175

Hypoglycemia in Child with Diabetes Mellitus

Signs and Symptoms

Autonomic: Shakiness, sweatiness, trembling, palpitations, pallor

Neuroglycopenic: poor concentration, blurred/double vision, disturbed color vision, difficulty hearing, slurred speech, poor judgement, confusion, problems with short-term memory, dizziness, unsteady gait, loss of consciousness, seizure.

Behavioral: Irritability, erratic behavior, agitation, nightmares, inconsolable crying

Non-specific: Hunger, headache, nausea, tiredness

PLUS

Blood glucose level: <4mmol/L in child with diabetes

Hypoglycemia

NOT ALERT

IV 10% dextrose 5ml/kg bolus over 2-3 minutes

OR

Glucagon IV, IM or SC (*Contraindicated if prolonged fasting*):

- 1mg for children above 25kg
- 0.5mg for children below 25kg

OR

Place child in lateral position to prevent aspiration and smear glucose gel or a thick paste of glucose on the dependant cheek pad

ALERT

Give 0.3g/kg of rapidly acting carbohydrates

Examples of 15g of carbohydrates: 3 glucose tablets, 3 teaspoons of sugar/ glucose dissolved in water, 175ml (3/4 cup) of juice, 3 teaspoons of honey.

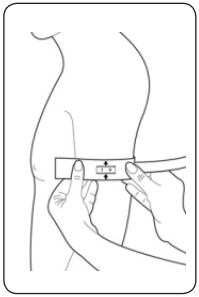
After treatment, retest the blood sugar after 15minutes.

If no response or an inadequate response, repeat oral intake as above.

Avoid chocolate, milk and other foods containing fat as glucose absorption will be delayed.

Once the hypoglycemia has been reversed, if next meal is >1hr away, follow with 15g of slower-acting carbohydrate such as bread, milk, biscuits, or fruit. Child should remain under observation for recurrence of hypoglycemia.

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 *(page 80 to 97)*

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 page 80 to 97)*		
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

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/kg1 0% 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 bag 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 44)*
- Transfuse *if Hb < 4 g/dL*, 10mls/kg whole blood in 3hrs + frusemide 1mg/kg *(for shock see previous page)*
- If patient has heart failure, transfuse 5-10mls/kg of packed red cells over 3hours.

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 45*) 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.

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 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

Feeding Children with Severe Acute Malnutrition

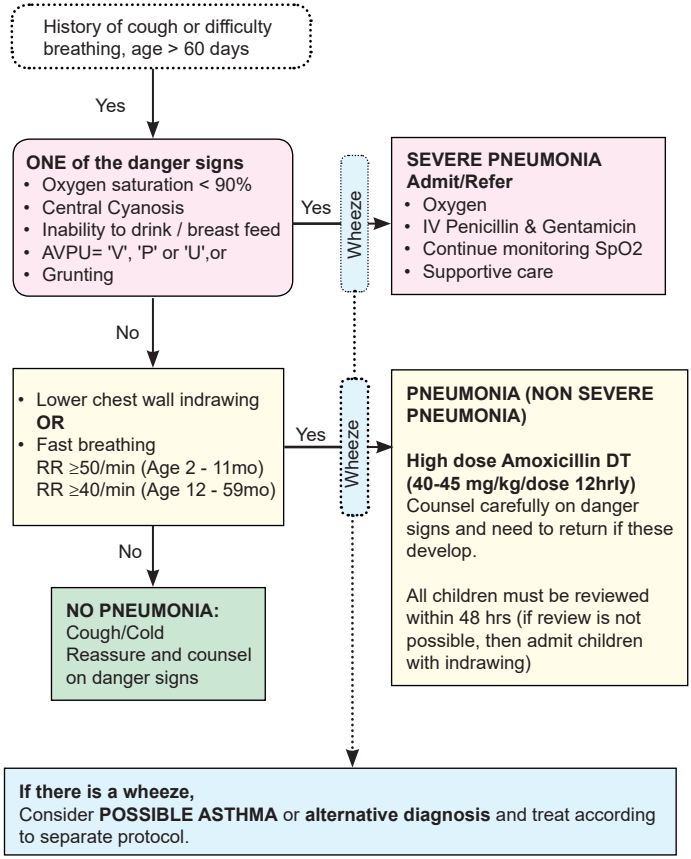
(age 6 - 59 months)

- 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 Rehabilitation 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.	F100 Rehabilitation phase	
	Total Feeds / 24 hrs	3 hourly feed volume	Total Feeds / 24 hrs	3 hourly feed volume	RUTF Transition Phase Packets per 24hrs	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). 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.	Packets per 24hrs
4.0	520	65	400	50	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	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



Pneumonia Treatment Failure Definitions

HIV Infection or TB may underlie treatment failure- testing helps the child. See HIV page for PCP treatment *(page 55)*; see TB page for PTB *(page 49)*

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 <u>without</u> 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 >38ºC* ✓ *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.
Cough lasting longer than 14 days	
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 (0-3yrs)and >180 bpm (4-5yrs)
- Silent chest on auscultation

Yes

Immediate Management

Admit/Refer
- Oxygen
- Nebulize 2.5 mg salbutamol or 6 puffs of inhaler with spacer and mask, repeat every 20 minutes upto 3 doses if needed
- Prednisolone 1-2mg/kg*
- Consider ipratropium bromide 250mcg when nebulized or 2 puffs of 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

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. (Look 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 and 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.

Tuberculosis Diagnosis

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

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

Investigations

- 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 (Refer to National TB guidelines)

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

¥ 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, gastric aspirate and stool. Attempt to obtain specimen in every child.***

Treat for TB in the following::
- All children with **bacteriologically confirmed TB OR**
- All children with a **clinical diagnosis of TB**

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

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).

Children must be weighed at every visit and dosage adjusted accordingly

Weight band (kg)	Number of tablets		
	Intensive phase		Continuation phase
	RHZ (75/50/150mg)	E (100mg)	RH (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*

HIV Testing Services (HTS) Recommendations for Different Populations and Settings

Population	Recommendations
Infants and children aged less than 18 months	▪ HIV testing of infants can be conducted at birth or at first contact within 2 weeks after birth. Infants tested at birth must be tested at the 6 weeks' immunization visit regardless of the results of the initial test at birth. ▪ 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
Children older than 18 months - 9 years	▪ Conduct HIV testing and counselling for all children of HIV infected adults as soon as possible, within one month of confirming the HIV positive status of the adult

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%

Guidelines on use of antiretroviral drugs for treating and preventing HIV infection in Kenya 2022 edition

Algorithm for Early Infant Diagnosis of HIV

Establish HIV exposure of Infants and Children < 18 months (including 0 - 6 week)
- Mother Known HIV positive
- HTS for mother with unknown HIV status
- Rapid antibody test on infant/child if mother's HIV status cannot be established

HTS Settings
At L&D, MNCH/FP, OPD, IPD, A&E, CCC & Community

Establish HIV infection for HIV Exposed Child at 6 weeks at first contact **(includes child with negative DNA PCR result at birth)**
- Collect a DBS for HIV DNA PCR test 1
- Start/continue infant ARV prophylaxis
- Start CPT

If Mother/infant HIV antibody test negative
Child is HIV unexposed
- Routine under-5 care for the well baby
- Repeat HIV testing for mother as per HTS recommendations

HIV DNA PCR test POSITIVE
Child presumed HIV infected
- Discontinue infant ARV prophylaxis
- Start ART
- Offer comprehensive care including continuation of CPT
- COLLECT new sample for CONFIRMATORY HIV DNA PCR and viral load at ART initiation [1]

HIV DNA PCR test NEGATIVE
Child HIV-exposed
- Continue HEI follow-up

Conduct DNA PCR at 6 months of age or soonest contact thereafter (or earlier if child develops symptoms suggestive of HIV-as per WHO staging criteria) [1]

Confirmatory HIV DNA PCR test POSITIVE Child confirmed HIV infected
- Continue ART and comprehensive care and routine under-5 care

Confirmatory HIV DNA PCR test NEGATIVE
Child presumed HIV infected
- Continue ART
- Collect and send a DBS for tie breaker to NHRL and manage as per the results from NHRL

HIV DNA PCR result NEGATIVE
Child HIV-exposed
- Continue HEI follow-up
- Conduct DNA PCR at 12 months of age or soonest contact thereafter till 18 months of age (or earlier if child develops symptoms suggestive of HIV-as per WHO staging criteria) [1]

HIV DNA PCR result NEGATIVE
Child HIV-exposed
- Continue HEI follow-up
- Continue routine under-5 care
- **Conduct HIV Antibody test at 18 months of age**
- If breast feeding, do HIV antibody test every 6 months while breast feeding and 6 weeks after complete cessation of breastfeeding

If HIV antibody test is positive
Child confirmed HIV infected
- Start ART and comprehensive care
- Continue CPT
- Continue routine under-5 care

If HIV antibody test is negative
Child HIV negative
- Stop CPT
- Review at age 2 years and document vital status
- Continue routine under-5 care

[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*

Pneumonia

All HIV exposed / infected children admitted with signs of severe pneumonia are treated with:

1. Penicillin and gentamicin first line, Ceftriaxone reserved as second line therapy
2. High dose cotrimoxazole if aged <5yrs (see below) - for treatment of Pneumocystis pneumonia (steroids are not recommended for PCP).

Treat and prevent Pneumocystis pneumonia with Co-trimoxazole (CTX)

Weight	**CTX syrup** 240mg/5mls	**CTXTabs** 120mg/tab	**CTXTabs** 480mg/tab	**Frequency**
1 - 4 kg	2.5 mls	1 tab	1/4	***24 hrly*** for prophylaxis
5 - 8 kg	5 mls	2 tabs	1/2	***8 hrly*** for 3 wks for PCP treatment
9 - 16 kg	10 mls	-	1	
17 - 50 kg		-	2	

Diarrhoea - All HIV exposed / infected children admitted with acute diarrhoea are treated in the same way as HIV uninfected children with fluids and zinc. For persistent diarrhoea (≥14 days) low-lactose or lactose free milks are recommended **if the child is ≥ 6 months of age.**

Meningitis - Request CSF examination for cryptococcus as well as traditional microscopy and culture for bacteria plus ZN stain.

HAART - See national guidelines for latest regimens

TB - See national guidelines for TB treatment in an HIV exposed / positive child

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 < 2,000g	2 mg/kg per dose, OD	4 mg/kg per dose, BD
Birth weight 2,000 - 2,499g	10 mg (1 ml), OD	10mg (1 ml), BD
Birth weight 2,500g	15mg (1.5 ml), OD	15mg (1.5 ml), BD
> 6 weeks to 12 weeks of age*		
Any weight	20mg (2 ml), OD	60mg (6 ml), BD

*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	25mg (2.5ml), OD
7 months – 9 months	30mg (3ml), OD
10 months – 12 months	40 mg (4ml), 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

Guidelines on use of antiretroviral drugs for treating and preventing HIV infection in Kenya 2022 edition

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

Ventilation should be started within 60 secs **(Golden Minute)**

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

- Check if airway is clear

If secretions are visible, suction to clear

- Put head in **sniffing** position

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

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 >100bpm:

- Give oxygen & titrate against SpO_2 (90-95%)
- IVF/EBM
- Blood sugars 2hrs after birth
- Keep warm & maintain at 36.5 - 37.5°C
- Essential Newborn Care - Vit K, cord care, eye care
- Treat infections if indicated
- Family centered care
- Ensure HIV risk is known

Yes

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

Newborn Care Management guidelines

1. **Keep warm** and maintain body temperature 36.5 - 37.5°C

2. **Cord care**
- **For term babies -** Apply Chlorhexidine digluconate 7.1% on the cord immediately after cutting the cord and then once daily up to the 7th day. (see next page on procedure).
- **For Pre-term babies** - Apply Chlorhexidine digluconate 7.1% once.

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 Tetracycline Eye Ointment 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 to 1 year:
- 2.5 mls of multivitamin syrup daily
- Folate 2.5mg weekly
- Iron supplementation (refer to page 7 for dosages)
- Vit D 400IU orally daily
- Daily calcium supplements(120 - 140mg/kg/d elemental calcium)
- Daily phosphorus (60 - 90mg/kg/d)

7. Kangaroo mother care (KMC). *Refer to The National KMC guidelines*

APPLICATION OF CHLORHEXIDINE DIGLUCONATE 7.1% GEL (CHX) FOR NEWBORN CORD CARE AFTER BIRTH.

Wash hands properly with soap under running water before and after application

Open Chlorhexidine Digluconate 7.1% gel for umbilical cord care.

Squeeze the Chlorhexidine Digluconate 7.1% gel on the finger

Apply Chlorhexidine Digluconate 7.1% daily for 7 days for umbilical cord care to prevent infection on the newborn baby. If the cord falls before day 7 stop application

Apply gel round the base of the umbilical cord and ensure application to all parts of the base.

Apply gel on the stump of the umbilical cord.

Apply gel on the tip of the umbilical cord.

DO NOT

- **DO NOT** apply anything else on the umbilical cord after applying Chlorhexidine Digluconate 7.1% gel.
- **DO NOT** clean off any Chlorhexidine Digluconate 7.1% gel from the umbilical cord after FIRST application. Wait for 24 hours.
- **DO NOT** use Chlorhexidine Digluconate 7.1% gel if umbilical cord is infected. STOP APPLICATION immediately and seek medical advice from the nearest health facility.

REMEMBER:

Always clean and dry the umbilical cord with luke warm water and cotton wool before subsequent new applications.

For more information, please visit the nearest health facility

Newborn Care Management guidelines

Newborn ≥ 1.5kg: Feeding / Fluid requirements

- **Well baby** - Immediate milk feeding **-Table A.** For first feed give 7.5mls and each feed increase by this amount until full daily volume reached
- **Day 1 - Unstable baby** start with IV 10% Dextrose for the first 24 hours. To stimulate the gut give 2mls/kg of colostrum via NGT every 3hrs once ABC are stabilized - **do not deduct this from IVF. Table B**
- **From 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 EBM to max of 180ml/kg/day, but it may be possible to increase volumes further to as much as 200mls/kg/day but seek expert advice.**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 (0.5 - 1ml/kg/day of 15% KCl) to 10% dextrose solution.
- Always feed with EBM unless contra-indicated
- Maximum fluid that can be given intravenously is 150ml/kg/d.
- 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 3hrly 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 unstable 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 an unstable newborn ≥ 1.5kg after 24 hrs IV fluids

Weight (kg)	1.5 - 1.6kg		1.7 - 1.8kg		1.9 - 2.0kg		2.1 - 2.2kg		2.3 - 2.4kg		2.5 - 2.6kg		2.7 - 2.8kg		2.9 - 3.0kg	
	EBM 3hrly	IVF mls/hr	EBM 3hrly	IVF mls/hr	EBM 3hrly	IVF mls/hr	EBM 3hrly	IVF mls/hr	EBM 3hrly	IVF mls/hr	EBM 3hrly	IVF mls/hr	EBM 3hrly	IVF mls/hr	EBM 3hrly	IVF mls/hr
D-1	3	4	4	4	4	5	4	5	5	6	5	6	6	7	6	7
D-2	6	3	7	4	7	4	8	4	9	5	10	5	10	6	11	6
D-3	12	3	13	3	15	3	16	4	18	4	19	4	21	5	22	5
D-4	17	2	20	2	22	2	24	3	26	3	29	3	31	3	33	4
D-5	23	1	26	2	29	2	32	2	35	2	38	2	41	2	44	2
D-6	29	1	33	1	37	1	40	1	44	1	48	1	52	1	55	1
D-7	35	0	39	0	44	0	48	0	53	0	57	0	62	0	66	0

Give 2mls/kg of colostrum every 3hours as trophic feeds on Day 1 after A, B and C are stabilized – ***DO NOT SUBTRACT THIS FROM THE IVF.***

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. For babies with poor weight gain, start EBM feeds with hind milk.

All preterms and low birth weight neonates 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.

Age	0.6kg	0.7kg	0.8kg	0.9kg	1.0kg	1.1kg	1.2kg	1.3kg	1.4kg	1.5kg
D-1	6	7	8	9	10	11	12	13	14	15
D-2	8	9	10	11	13	14	15	16	18	19
D-3	9	11	12	14	15	17	18	20	21	23
D-4	11	12	14	16	18	20	21	23	25	26
D-5	12	14	16	18	20	22	24	26	28	30
D-6	14	16	18	20	23	25	27	29	32	34

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

- **Day 1 - unstable newborn** (convulsions, unconscious, severe respiratory distress evidenced by severe chest wall indrawing, absent bowel sounds) start IV 10% Dextrose 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 30ml/kg/day and reduce IV fluids to keep within the total daily volume until IVF stopped i.e. until full 3 hourly feed volume is 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 increase enteral feeds further to as much as 200mls/kg/day but seek expert advice.
- For IV fluids from Day 2, add Na+ 2-3mmol/kg/day (19mls/kg of normal saline) and K+ 1-2mmol/kg/day (0.5 - 1ml/kg/day of 15% KCl) to 10% dextrose solution.
- Always feed with EBM unless contra-indicated.
- Maximum fluid that can be given intravenously is 150ml/kg/d.

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

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

Weight (kg)	8.0 to 0.9	0.9 to 1.0	1.1 to 1.2	1.3 to 1.4	1.4 to 1.5
Day 1	3	3	4	4	5
Day 2	4	4	5	5	6
Day 3	5	5	6	7	8
Day 4	5	6	6	8	9
Day 5+	6	7	7	9	10

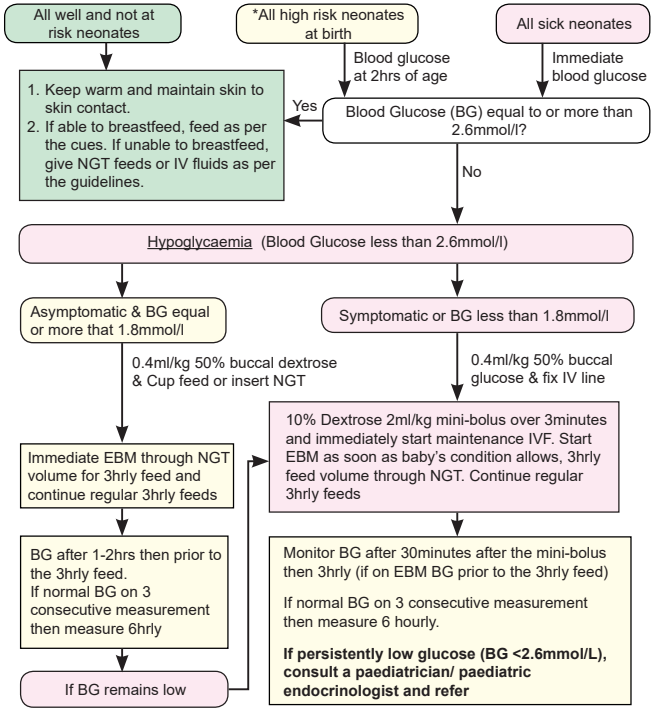
Standard regimen for introducing NGT feeds for unstable newborns <1.5kg

	0.6kg		0.7kg		0.8kg		0.9kg		1.0-1.1kg		1.2-1.3kg		1.4-1.5kg	
	EBM 3 hrly	IVF mls/ hr	EBM 3 hrly	IVF mls/ hr	EBM 3 hrly	IVF mls/ hr	EBM 3 hrly	IVF mls/ hr	EBM 3 hrly	IVF mls/ hr	EBM 3 hrly	IVF mls/ hr	EBM 3 hrly	IVF mls/ hr
D-1		2		2		3		3		4		4		5
D-2	2	2	3	2	3	2	3	3	4	3	5	4	5	4
D-3	5	2	5	2	6	2	7	2	8	3	9	3	11	4
D-4	7	1	8	1	9	2	10	2	12	2	14	3	16	3
D-5	9	1	11	1	12	1	14	1	16	1	19	2	22	2
D-6	11	0	13	0	15	0	17	0	20	0	23	0	27	0
D-7	14	0	16	0	18	0	20	0	24	0	28	0	33	0

Give 2mls/kg of colostrum every 3hours as trophic feeds on Day 1 after A, B and C are stabilized – ***DO NOT SUBTRACT THIS FROM THE IVF.***

Early Onset Neonatal Hypoglycemia

Age 0 - 72hrs of life

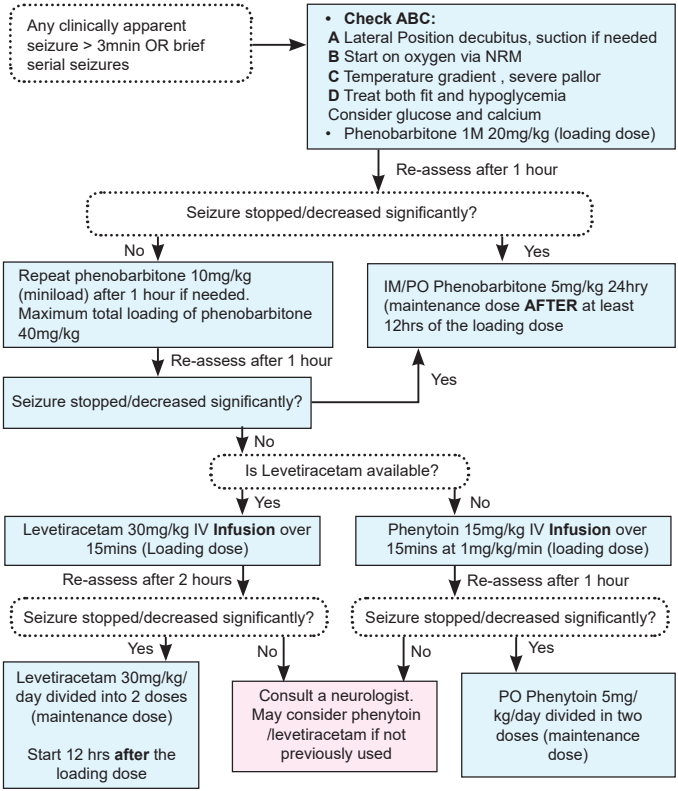


		Mild-moderate (Don't miss these signs!)	Severe
Symptoms and signs associated with hypogly-caemia	**CNS**	Jitteriness, irritability, High pitched cry Lethargy, hypotonia, Tremors, Hypothermia	Seizure, and even sudden death
	RS	Tachypnoea	Apnoea, Cyanosis
	CVS	Tachycardia, Sweating	Pallor (circulatory collapse)
	GI	Poor feeding, Vomiting	

**High-risk neonates include preterms, Intrauterine growth retardation (IUGR),Small for gestational age (SGA), hypothermia, perinatal asphyxia, Infant of diabetic mother (IODM), Large for gestational age (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-ischemic encephalopathy need not to be given prophylactic treatment with phenobarbitone



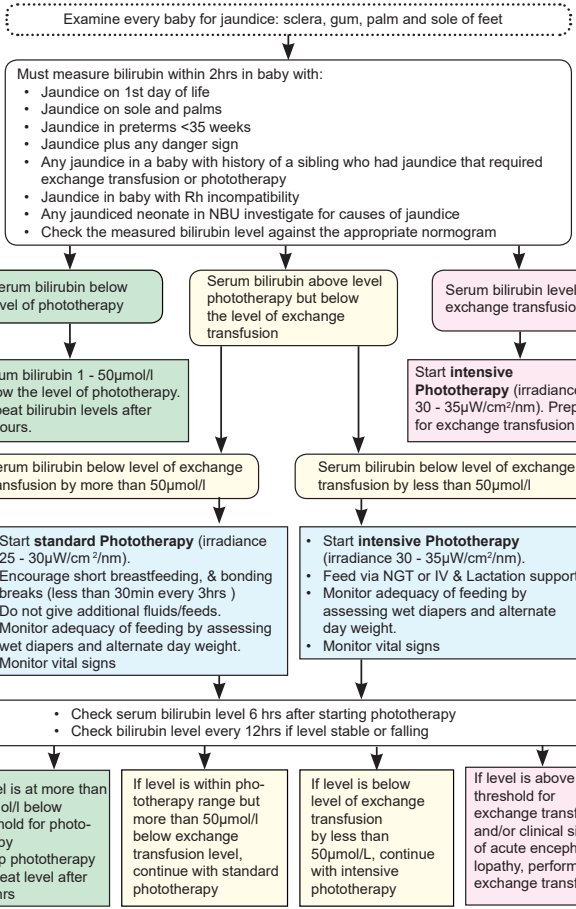
WHEN TO STOP ANTICONVULSANTS:

1. In neonates with neurological examination and/or normal electroencephalography, consider stopping antiepileptic drugs if neonate has been seizures-free for more than 72hrs; the drug(s) should be reinstituted in case of reoccurence of seizures.
2. In neonates in whom seizure control is achieved with a single antiepileptic drug, the drug can be discontinued abruptly without 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, the blanched skin on nose and the sole of the foot.
- ✓ Refer early if there is jaundice in those **aged <24** hrs and facility cannot provide phototherapy and/or exchange transfusion
- ✓ If bilirubin measure is unavailable start phototherapy in the following:
  - A well-baby with jaundice easily visible on the sole of the foot
  - A preterm baby with ANY visible jaundice
  - 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 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
7. **Do periodic (12 to 24 hrs)** plasma/serum bilirubin test. Visual testing for jaundice or transcutaneous bilirubin is unreliable.
8. 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
9. 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

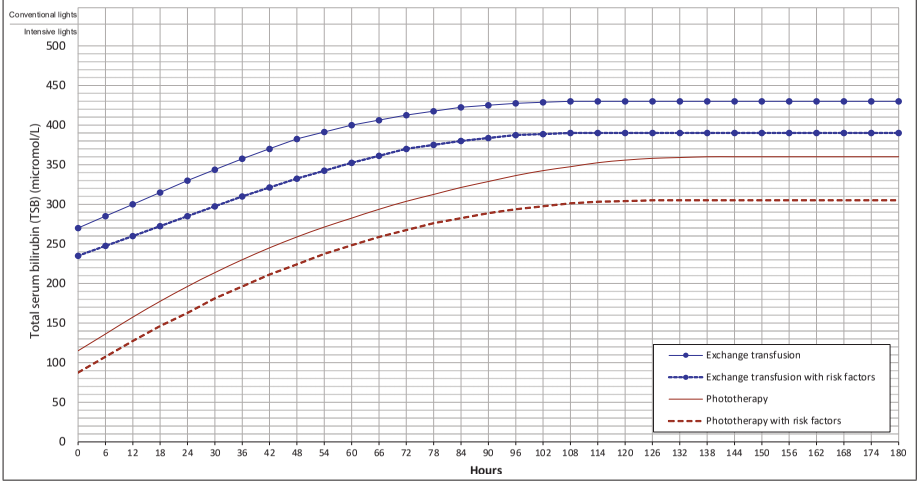


Risk factors for bilirubin encephalopathy: dehydration, preterm births, respiratory distress, sepsis, hypoxia, seizures, acidosis, rate of increase of bilirubin level.

NORMOGRAM A - Jaundice Management for Baby Greater than 38 Wks Gestation

1. 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. If the TSB is greater than 50 micromol/L below line, stop phototherapy 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.

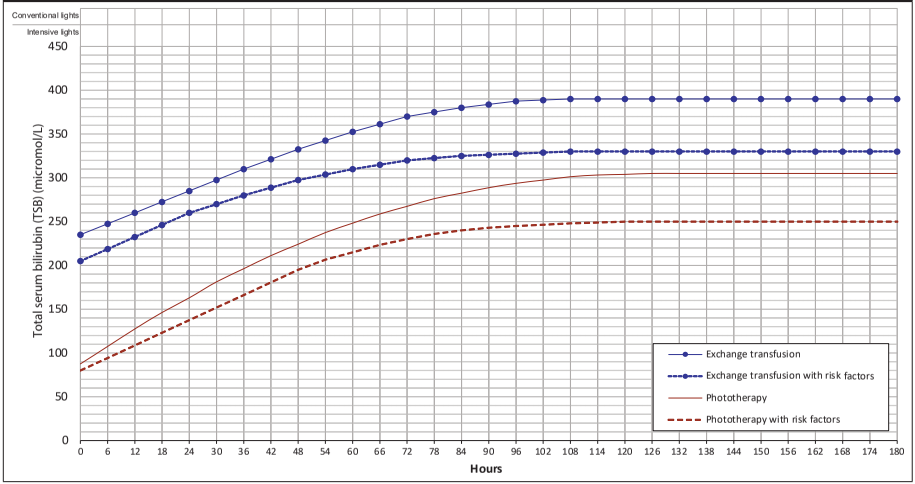
Baby greater than 38 weeks gestation



NOMOGRAM B: Jaundice Management for Baby 35+0 to 37+6 Weeks Gestation

1. 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. If the TSB is greater than 50 micromol/L below line, stop phototherapy 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.

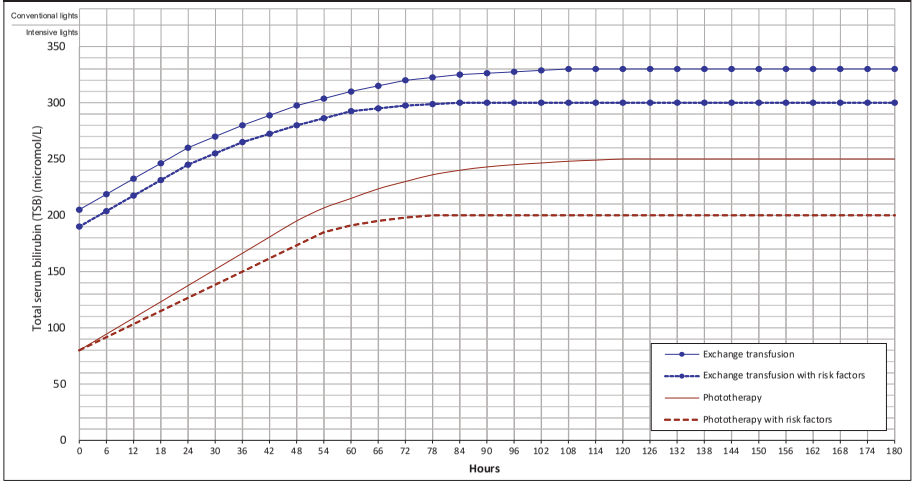
Baby 35+0 to 37+6 weeks gestation



NORMOGRAM C - Jaundice Management for Baby Less than 35Wks Gestation, Greater than 1999G Birth Weight

1. 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. If the TSB is greater than 50 micromol/L below line, stop phototherapy 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.

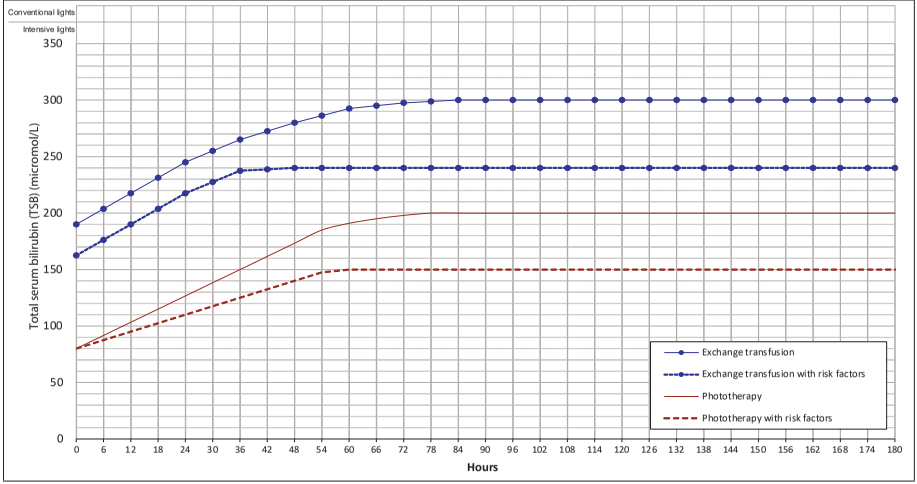
Baby less than 35 weeks gestation, greater than 1999g birth weight



NORMOGRAM D - Jaundice Management For Baby Less Than 35Wks Gestation, 1500G - 1999G Birth Weight

1. 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. If the TSB is greater than 50 micromol/L below line, stop phototherapy 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.

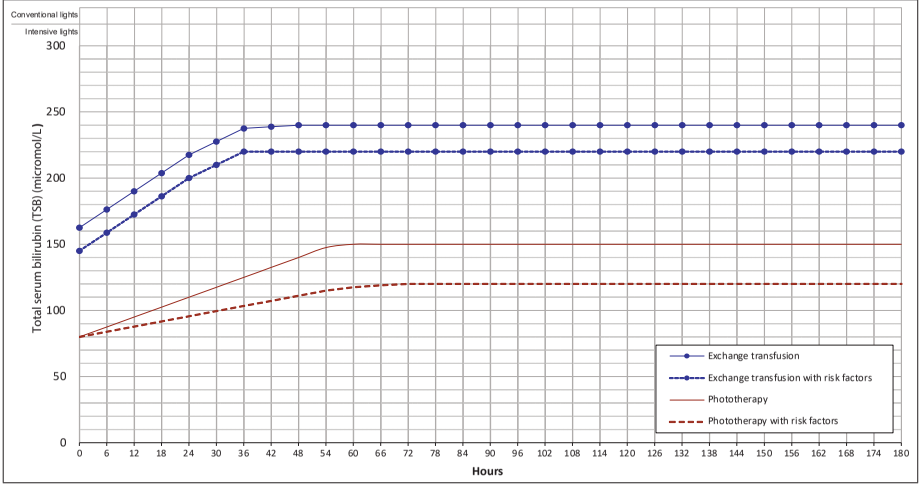
Baby less than 35 weeks gestation, 1500g–1999g birth weight



NORMOGRAM E - Jaundice Management for Baby Less than 35Wks Gestation, 1000G - 1499G Birth Weight

1. 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. If the TSB is greater than 50 micromol/L below line, stop phototherapy 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.

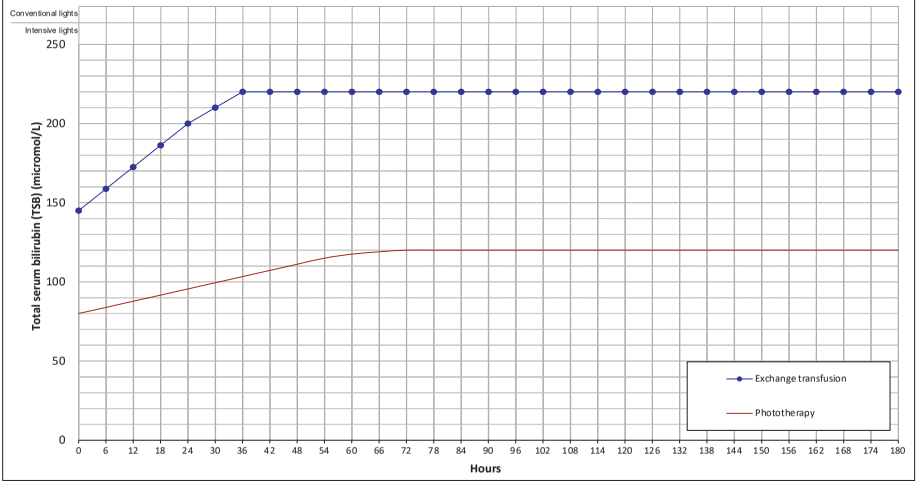
Baby less than 35 weeks gestation, 1000g–1499g birth weight



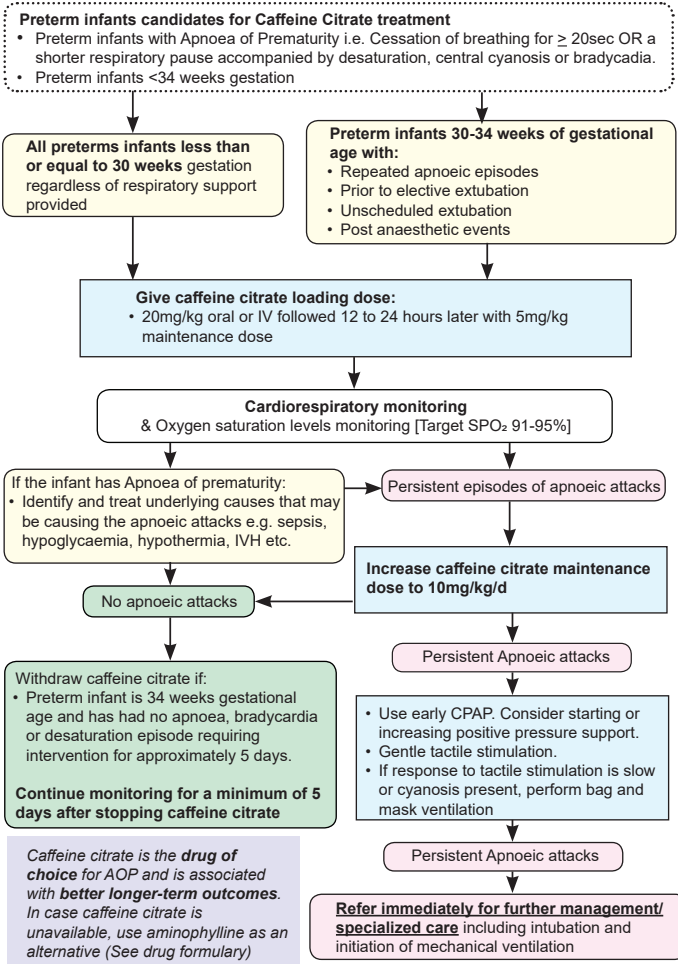
NORMOGRAM F - Jaundice Management for Baby Less than 35Wks Gestation, Less than 1000G Birth Weight

1. 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. If the TSB is greater than 50 micromol/L below line, stop phototherapy 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.

Baby less than 35 weeks gestation, less than 1000g birth weight

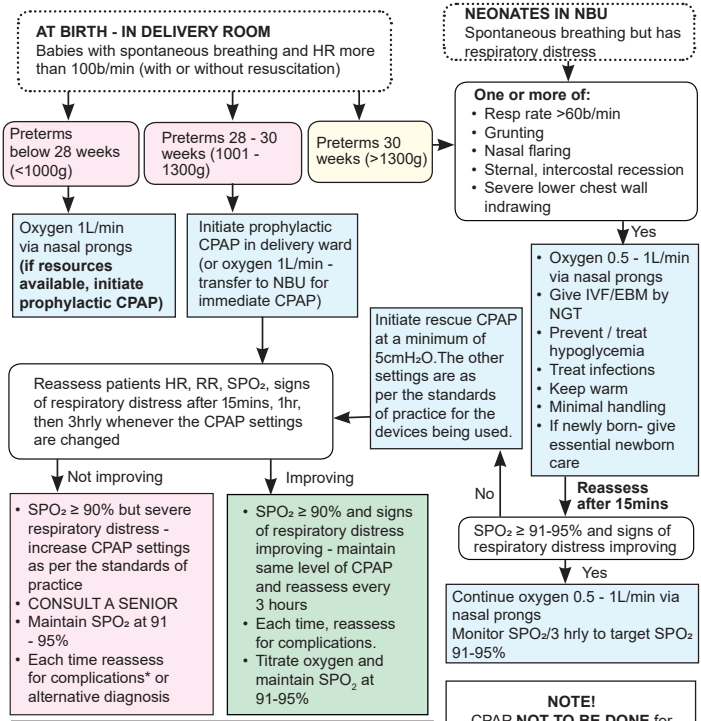


Apnoea of Prematurity (AOP)



*Caffeine citrate is the **drug of choice** for AOP and is associated with **better longer-term outcomes**. In case caffeine citrate is unavailable, use aminophylline as an alternative (See drug formulary)*

Continuous Positive Airway Pressure (CPAP)



** Complications of CPAP include air leaks 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 / poor feeding
- Apnea
- Unable to cry/ high pitched cry
- Central cyanosis/SpO2 <90%
- Bulging fontanelle
- Persistent vomiting

YES

Severe neonatal sepsis:
- Admit
- Oxygen if SpO_2 <90%
- Keep warm if temp <35.5°C; expose if temp ≥38°C
- Check for hypoglycemia, treat if unable to measure glucose *(page 64)*
- NGT feeds or IVF *(page 60)*
- Do blood and CSF cultures
- Give IV Crystalline penicillin and Gentamicin (OR Cefotaxime and Crystalline penicillin) for a min of 7days

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 64)*
- NGT feeds or IVF *(page 60)*
- IV Crystalline penicillin and Gentamicin for 2 days. If baby is clinically improved and feeding well, change to oral Amoxicillin for 5 days as outpatient *(page 78)*

NO

Systemic bacterial infection unlikely

Assess for other illness and treat appropriately. Advice mother on the danger signs and arrange for an early review within 24 hrs.

For severe neonatal sepsis or neonatal sepsis:

1. Flucloxacillin and Gentamicin is preferred in:
   - Suspected staphylococcal septicaemia
   - Neonates with signs of sepsis and also has extensive skin pustules/abscess/ omphalitis
2. If necrotizing enterocolitis is suspected, add Metronidazole

Duration of treatment for neonatal sepsis

Problem	Days of treatment
Signs of neonatal infection in a baby breastfeeding 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 generalized 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 (Crystalline 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 >38ºC)
  - 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 for neonates aged ≤ 7 days; For neonates aged more than 7 days see *page 22.*					
Weight (kg)	**Penicillin (50,000iu/kg)**	**Ampicillin / Flucloxacillin (50mg/kg)**	**Gentamicin (3mg/kg <2kg, 5mg/kg ≥ 2kg)**	**Ceftriaxone (50mg/kg)**	**Metronidazole (7.5mg/kg)**
	IV / IM	**IV / IM**	**IV / IM**	**IV / IM**	**IV**
	12 hrly	**12 hrly**	**24 hrly**	**24 hrly**	**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:
- ✓ Ceftriaxone 50mg/kg IM (Max 125mg) Or
- ✓ Kanamycin or Spectinomycin 25mg/kg (max 75mg) IM.

Warning:
- ✓**Gentamicin** – Please check if 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

Calculating a child's weight for length or height

In the tables:

1. Locate the appropriate table for boys or girls
2. Locate the row containing the child's length/height in the left column
3. Note where the child's weight lies with the respect to the length recorded in this row
4. Look up the column to read the weight-for-length Z - Score of the child

Example: 5months old Boy: length 48cm, weight 2.5kg. His weight-for-length is -2SD.

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

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

Weight-for-length GIRLS
Birth to 2 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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-for-length GIRLS
Birth to 2 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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-for-length GIRLS
Birth to 2 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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-for-length GIRLS
Birth to 2 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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

Weight-for-length GIRLS
Birth to 2 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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

WHO Child Growth Standards

Weight-for-height GIRLS
2 to 5 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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-for-height GIRLS
2 to 5 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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-for-height GIRLS
2 to 5 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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-for-height GIRLS
2 to 5 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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

WHO Child Growth Standards

Weight-for-length BOYS
Birth to 2 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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
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

Weight-for-length BOYS
Birth to 2 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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
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

Weight-for-length BOYS
Birth to 2 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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
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

Weight-for-length BOYS
Birth to 2 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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
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

Weight-for-length BOYS
Birth to 2 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
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

WHO Child Growth Standards

Weight-for-height BOYS
2 to 5 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
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
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

Weight-for-height BOYS
2 to 5 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
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
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

Weight-for-height BOYS
2 to 5 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
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
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

Weight-for-height BOYS
2 to 5 years (z-scores)

World Health Organization

cm	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
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

WHO Child Growth Standards

Emergency Estimation of Child's Weight from their Age

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 - 9 months	9.0	
10 - 12 months	10.0	
1 - 2 yrs	11.0	
2 - 3 yrs	13.0	
3 - 4 yrs	15.0	
4 - 5 yrs	17.0	

BASIC PAEDIATRIC PROTOCOLS
November 2022

5TH EDITION