REPUBLIC OF KENYA

MINISTRY OF HEALTH

BASIC PAEDIATRIC PROTOCOLS

for ages up to 5 years

January 2016

4th Edition

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Foreword

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

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

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

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

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

Dr. Nicholas Muraguri
The Principal Secretary
Ministry of Health

Principles of good care

1) Facilities must have basic equipment and drugs in stock at all times.

2) Sick children coming to hospital must be immediately assessed (triage) 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 can often then provide invaluable assistance caring for the child. Being polite to parents considerably improves communication.

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

8) Correct supportive care – particularly adequate feeding, use of oxygen and fluids - is as important as disease specific care.
9) Laboratory tests should be used appropriately and use of unnecessary drugs should be avoided.

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

11) Good hand washing practices and good ward hygiene improve outcomes for admitted newborns and children.

Specific policies

- ✓ All children admitted to hospital and all newborns requiring medical treatment - even if born in hospital - should have their own inpatient number and admission should ideally be recorded using a standardized paediatric or newborn admission record form.
- ✓ Treatments, including supportive care, should be fully prescribed.
- ✓ Medical records are legal documents and entries should be clear, accurate and signed with a date and time of the entry recorded.
- ✓ All paediatric admissions should be offered HIV testing using PITC.
- ✓ All newborn admissions aged ≤ 14 days should receive Vitamin K unless it has already been given.
- ✓ Routine immunization status should be checked and missed vaccines given before discharge.

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) is the most appropriate and rapid means to assess for severe acute malnutrition for children > 6months of age.
- ✓ Respiratory rates must be counted for 1 minute.
- ✓ Conscious level should be assessed on all children admitted using the AVPU scale or an alternative such as the GCS (Glasgow coma scale) adapted for children.
- ✓ Children with AVPU < A should have their blood glucose checked. If this is not possible treatment for hypoglycaemia should be given.
- ✓ The sickest newborns / children on the ward should be near the nursing station and prioritized for re-assessment / observations.

Hand Hygiene

- Good hand hygiene saves lives - gloves do not protect patients.
- Alcohol hand-rubs are more effective than soap and water and are recommended:
  - If hands are visibly dirty they must be cleaned first with soap and water before drying and using alcohol hand-rub.
  - The alcohol hand-rub must be allowed to dry off to be effective.
  - If alcohol hand-rub is not available hands should be washed with soap and water and air-dried or dried with disposable paper towels.
- **Hand hygiene should be performed:**
  - After contact with any body fluids.
  - Before and after touching a patient and most importantly before and after handling cannulae, giving drugs or performing a procedure (eg. suction).
  - Before and after visiting the bathroom or touching potentially contaminated surfaces (e.g. cot sides, stethoscopes).

Hand hygiene technique

RUB HANDS FOR HAND HYGIENE!
WASH HANDS WHEN VISIBLY SOILED

Duration of the entire procedure: 20-30 seconds

1a

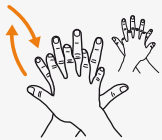
Apply a palmful of the product in a cupped hand, covering all surfaces;

1b

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;

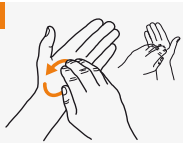
5

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

Once dry, your hands are safe.

WHO guidelines on hand hygiene in health care 2009

Clinical audit and use of the protocols

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

2. 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. Then follow up on whether progress is being achieved with new audits. Identify new problems and plan new actions etc.

3. 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.

   Deaths and surviving cases can be audited **Records of all deaths should be audited within 24 hours of death.**

4. 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.

5. Was care reasonable? Look for where improvements could be made in the system of care before the child comes to hospital (referral), on arrival in hospital (care in the OPD / MCH etc.), on admission to a ward, or follow up on the ward.

6. Look at assessments, diagnoses, investigations, treatments and whether what was planned was done 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!**

7. Look at several cases for each meeting and summarize the findings **looking for the major things that are common and need improving.** Then record the summaries and action points for reporting.

Essential Drugs	**Doses** (For overweight children, base dose calculation on median weight for age or height)
Adrenaline *1 in 10,000*	Give 0.1ml/kg IV in resuscitation. To make this strength dilute 1 ml of 1 in 1000 adrenaline in 9 mls water for injection to make 10mls
Adrenaline *1 in 1,000*	Severe viral croup 2ml of 1:1000 nebulized If effective repeat with careful monitoring
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 12hrly.
Amoxicillin	Use 25mg/kg/dose for simple infections and 40-45mg/kg for pneumonia (*Newborn Page 50, other ages Page 13)*
Ampicillin	**Neonate:** 50mg/kg/dose 12 hourly IV or IM if aged ≤ 7 days and 8 hourly if aged 8 - 28 days. **Age 1m and over:** 50mg/kg/dose (Max 500mg) 6 hourly IV/ IM
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)
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 50, other ages Page 12*
Caffeine Citrate	Loading dose: oral: 20 mg/kg (or IV over 30 min) maintenance dose: 5 mg/kg daily oral (or IV over 30 min)

Essential Drugs	**Doses** (For overweight children, base dose calculation on median weight for age or height)
Calcium (Monitor calcium especially if on Vitamin D or long term therapy)	**Symptomatic hypocalcemia (tetany / convulsions)** IV bolus of 10% calcium gluconate 0.5 ml/kg (0.11 mmol/kg) to a maximum of 20 ml/kg over 5 - 10 min then continuous IV infusion over 24 h of 1.0 mmol/kg (maximum 8.8 mmol). **Mild hypocalcemia** 50 mg /kg / day of elemental calcium PO in 4 divided doses
Carbamazepine (PO)	**Age 1 m - 12yrs**: initially 5 mg/kg at night, increased as necessary by 2.5 - 5 mg/kg every 3 -7 days; usual maintenance dose 5 mg/kg 2-3 times daily. *Avoid abrupt withdrawal and watch carefully for side effects*
Cefotaxime	*Preferred to Ceftriaxone for treatment of neonatal meningitis if aged ≤ 7 days:* **Pre-term:** 50mg/kg 12 hourly; **Term aged ≤ 7 days:** 50mg/kg 8 hourly
Ceftazidime	**Age ≤ 7 days or weight < 1200g** : 50 mg/kg IM/IV 12 hourly **Age > 7 days or weight >1200 g** : 50 mg/kg IM/IV 8 hourly **1 mo- 12 yrs** : 30-50 mg/kg IM/IV 8 hourly (Max: 6 g/ day) **(for pseudemonal infections)**
Ceftriaxone	*Newborn Page 50, other Page 12*
7.1% Chlorhexidine Digluconate	(4% Chlorhexidine) apply once daily until the cord separates
Ciprofloxacin *(oral)*	***Dysentery dosing:*** Page 13 *Note: may increase renal toxicity of gentamicin/amikacin)*
Clotrimazole 1%	Use Clotrimazole paint for oral thrush and apply 2-3 times daily until cleared
Co-trimoxazole *(4mg/kg Trimethoprim &20mg/kg sulphamethoxazole)*	**Weight** | **240mg/5ml (syrup)** *12 hrly* | **480mg (tabs)** *12 hrly* **2 - 3kg** | 2.5 mls | 1/4 **4 - 10kg** | 5 mls | 1/2 **11 - 15 kg** | 7.5 mls | 1/2 **16 - 20 kg** | 10 mls | 1
Dexamethasone	IV or IM 0.6mg/kg stat *for severe viral croup*
Dextrose/glucose	5mls/kg 10% dextrose IV over 3-5 mins, *page10* **Neonate**: 2 mls/kg

Essential Drugs	Doses (For overweight children, base dose calculation on median weight for age or height)
Dihydrocodeine	**Age 1- 4 yrs**: 0.5mg / kg every 4-6 hours **Age 4 - 12 yrs**: 0.5 -1 mg/kg (max. 30 mg) every 4 - 6 hrs
Diazepam (*IV*)	0.3 mg/kg & See separate chart Page 10
Diazepam (*rectal*)	0.5mg/kg & *See separate chart Page 10*
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: 2 g/day
Flucloxacillin	Newborn Page 50, other Page 12 & 13
Gentamicin	7.5 mg/kg/24 hr IM or slow IV Newborn Page 50, other Page 12
Hydroxyurea	*(For severe SCD only: Pain >3 episodes/ yr; stroke; transfusion ≥ 2/ yr; acute chest syndrome)* Child 2-12 years initially 10-15mg/kg once daily, increased every 12 weeks in steps of 2.5 - 5 mg/kg daily according to response; usual dose 15 - 30 mg/kg daily (max. 35 mg/kg daily)
Ibuprofen	5 - 10 mg/kg 8 hourly
Iron (Fe)	**Iron deficiency anaemia**: Pre-term infant: 2 - 4 mg elemental Fe/kg/day max dose: 15 mg elemental Fe/day **Child:** 3 - 6 mg elemental Fe/kg/day **Prophylaxis:** Pre-term infant 2 - 4 mg elemental Fe/kg/24 hr max dose: 15 mg elemental Fe/day Term: 1-2mg elemental Fe/24 hr Max 15mg per day

Essential Drugs	Doses (For overweight children, base dose calculation on median weight for age or height)
Lactulose	**Hepatic Encephalopathy Infants:** 1.7 - 6.7 g/day (2.5 - 10 mL) orally daily divided in 3 to 4 doses. Adjust dosage to produce 2 - 3 soft stools per day. **Children:** 25-60 g/day (40-90 mL) orally daily divided in 3-4 doses. Adjust dosage to produce 2-3 soft stools/day. **Chronic constipation:** Children: 0.7 - 2 gm/kg/day (1 to 3 mL/kg/day) orally in divided doses daily; not to exceed 40 g/day (60 mL/day).
Lorazepam	0.1mg/kg IV over 30-60 seconds Max dose 4mg (Page 10)
Metronidazole	*Newborn Page 50, other Page 12 & 13*
Morphine	**Neonate:** 0.05 - 0.2 mg/kg/dose IM, SC, slow IV every 4hr **Infant and Child:** PO 0.2 - 0.5 mg/kg/dose every 4 - 6 hr as needed IM IV/SC 0.1 - 0.2 mg/kg/dose every 2-4 hrs as needed max 15 mg/dose
Nystatin	**Pre terms** 0.5ml (50,000 U) **Term** 1ml (100,000 U) to each side of the mouth 6 hrly *(2 weeks if HIV+ve)*
Oral Rehydration Solution (ORS)	Low Osmolarity formula for treatment of diarrhoea (see page 20 & 21)
Paracetamol	10-15mg / kg 6 to 8 hrly
Pethidine, im	0.5 to 1mg / kg every 4- 6 hours
Phenobarbitone	Loading with 15mg/kg *(if NOT on maintenance phenobarb)* followed by 2.5mg - 5mg/kg daily, *Page 11*
Phenytoi	**Age 1m - 12 yrs (** IV, oral) 15-20 mg/kg at a rate not exceeding 1 mg/kg/minute as a loading dose; maintenance dose of 2.5 - 5 mg/kg twice daily (max. 150mg twice daily) *Similar dosing can be used in neonates.*
Potassiu	**Hypokalemia** oral 1 - 4 mmol/kg/day monitor serum potassium
Prednisolone -	Asthma 2mg / kg PO daily *(usually for 3-5 days)*

Essential Drugs	**Doses** (For overweight children, base dose calculation on median weight for age or height)
Quinine	*Page 24*
Salbutamol *IV therapy should only be used on an HDU, ideally with amonitor, and MUST be given slowly as directed*	**IV in hospital only over 5 mins** - < 2 yrs 5 microgram/kg, ≥ 2 yrs up to 15 microgram/kg *maxdose 250 micrograms(0.25mg)* **Nebulised:** 2.5mg/dose as required refer to page 32 **Inhaled** *(Acute exacerbation)* (100 microgram per puff) 2 puffs via spacer repeated as required acutely or 2 puffs up to 4-6 hrly for acute wheeze for < 5 days *(see page 32 for emergency use).*
TB Treatment	*See page 32*
sodium Valproate	Neonate initially 20mg/kg once daily; maintenance 10 mg/kg twice daily PO 1 mo - 12yrs initially 10-15 mg/kg (max. 600mg) daily in 1-2 divided doses max 60 mg/kg daily. Maintenance 25-30 mg/kg daily in 2 divided doses PO

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

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

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

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

Vitamin D - ***Maintenance***
After treatment course

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

Vitamin K	**Newborns:** 1mg stat IM (<1500g, 0.5mg IM stat) **For liver disease:** 0.3mg/kg stat, max 10mg
Zinc Sulphate *For Diarrhoea*	**Age ≤ 6 m**: 10mg daily for 10-14 days **Age > 6 m**: 20mg daily for 10-14 days

Emergency drugs – Diazepam, Lorazepam and Glucose

(Note: Diazepam is not used in neonates)

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

Anticonvulsant drug doses and administration

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

Intravenous/intramuscular antibiotic doses

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

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

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

Oral antibiotic doses

(for neonatal doses see page 50)

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

Initial Maintenance Fluids/Feeds

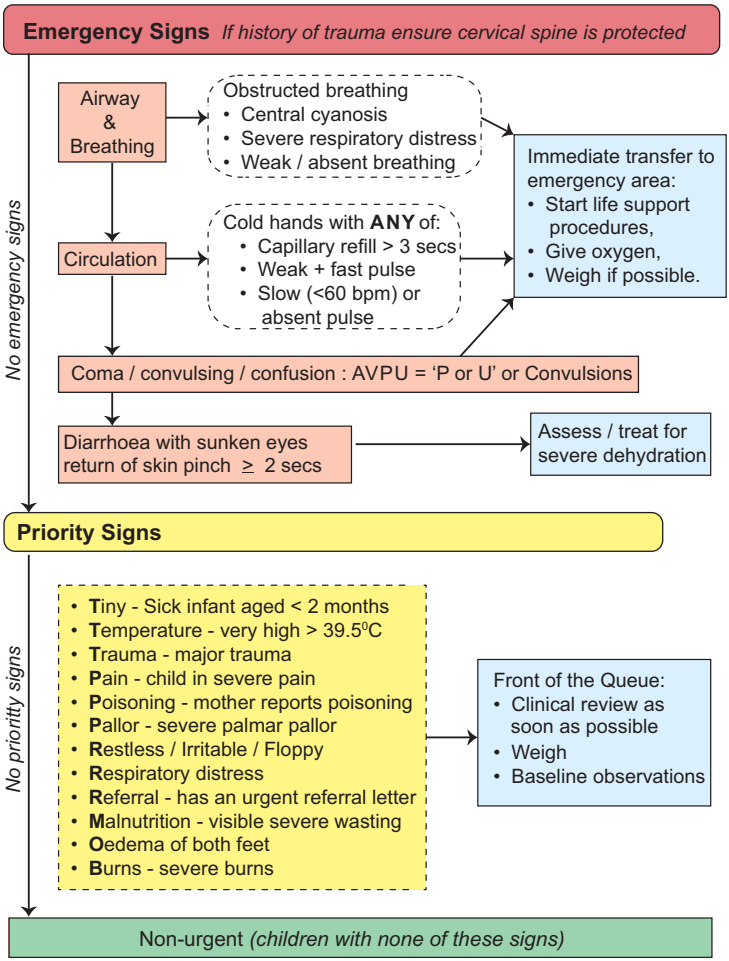
(Normal Renal function)

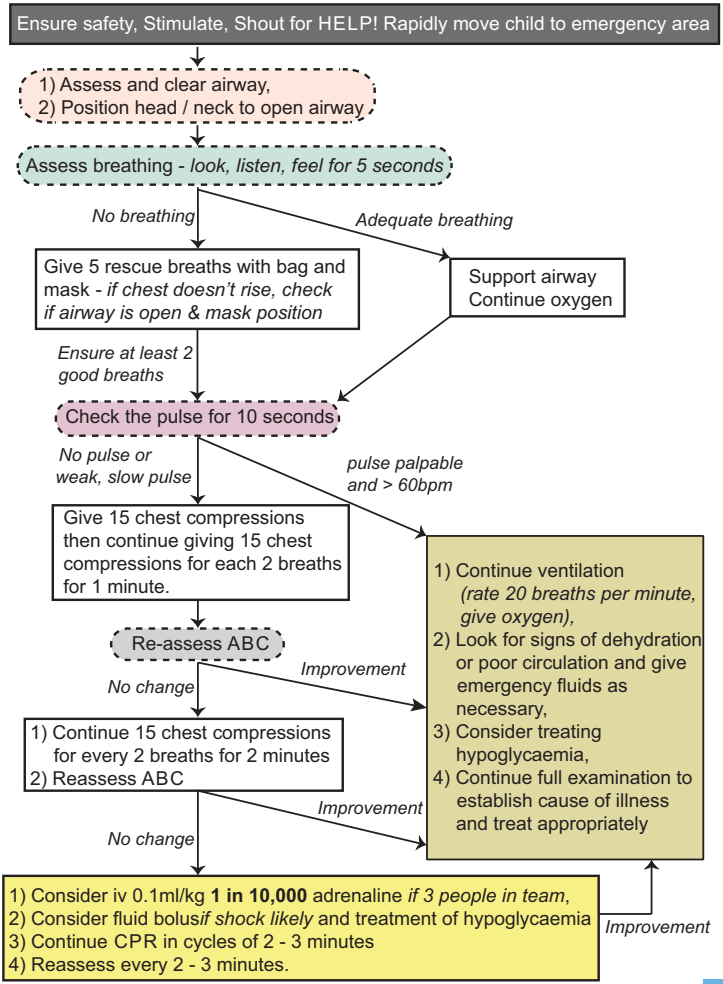
Note:

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

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

Triage of sick children




Ensure safety, Stimulate, Shout for HELP! Rapidly move child to emergency area
1) Assess and clear airway,
2) Position head / neck to open airway
Assess breathing - look, listen, feel for 5 seconds
No breathing
Adequate breathing
Give 5 rescue breaths with bag and mask - if chest doesn't rise, check if airway is open & mask position
Support airway
Continue oxygen
Ensure at least 2 good breaths
Check the pulse for 10 seconds
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 1 minute.
1) Continue ventilation (rate 20 breaths per minute, give oxygen),
2) Look for signs of dehydration or poor circulation and give emergency fluids as necessary,
3) Consider treating hypoglycaemia,
4) Continue full examination to establish cause of illness and treat appropriately
Re-assess ABC
Improvement
No change
1) Continue 15 chest compressions for every 2 breaths for 2 minutes
2) Reassess ABC
Improvement
No change
1) Consider iv 0.1ml/kg 1 in 10,000 adrenaline if 3 people in team,
2) Consider fluid bolus if shock likely and treatment of hypoglycaemia
3) Continue CPR in cycles of 2 - 3 minutes
4) Reassess every 2 - 3 minutes.
Improvement

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*** (*appropriate for age*)	Position only if not alert and placed on couch Suction (to where you can see) if indicated (**not in alert child)**, Guedel airway only if minimal response to stimulation
B	Assess adequacy of breathing • Cyanosis? • Check oxygen saturation • Grunting? • Head nodding? • Rapid or very slow breathing? • Indrawing? • Deep / Acidotic breathing ***If signs of respiratory distress listen for wheeze***	**Decide:** • Is there a need for oxygen? • Is there a need for immediate bronchodilators?
C	• Assess adequacy of circulation • Large pulse *very fast or very slow?* • Temperature gradient? • Capillary refill? • Peripheral pulse *weak or not palpable* *(Note initial response to stimulation/alertness)* • Check for signs of severe pallor ***If signs of poor circulation*** • Check for severe dehydration • Check for signs of severe pallor • Check for severe malnutrition	**Decide:** • Does this child have severely impaired circulation **AND** diarrhoea with sunken eyes / prolonged skin pinch? ***If yes*** give Ringer's Lactate **over 15 mins** as rapid bolus and progress to Plan C fluids for diarrhoea/dehydration • If there is **NO** severe diarrhoea / dehydration but severely impaired circulation **with or without** severe malnutrition give 20mls /kg of Ringer's Lactate over 2 hours. Use Ringer's / 5% dextrose in severe malnutrition • ***If there is respiratory distress and circulatory compromise with severe pallor*** organise immediate transfusion
D	Assess AVPU Check glucose at bedside	**Decide:** Does this child need 10% dextrose?

Use of Intra-osseous lines

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

Prescribing oxygen

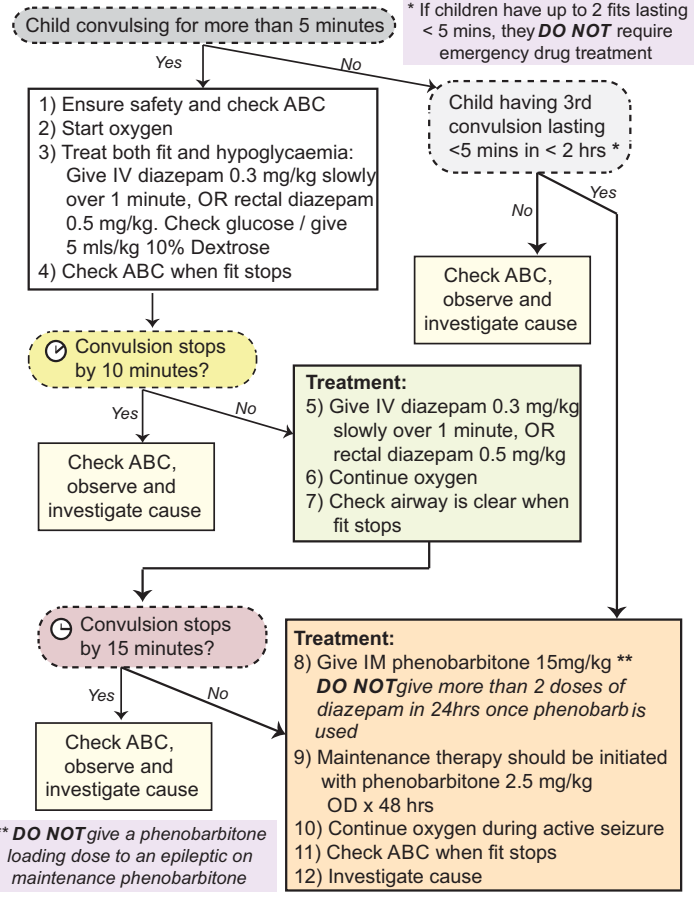
Oxygen Administration Device	Flow rate and inspired O_2 concentration
Nasal prong or short nasal catheter*	**Standard flow** **Neonate** - 0.5 L/min **Infant / Child** - 1 - 2 L/min **O_2 concentration** - approx 30-35% * **High flow** **Neonate** - 2 L/min **Infant / Child** - 4 L/min **O_2 concentration** - approx 45-55%
Naso-pharyngeal catheter	**Neonate** - *not recommended* **Infant / Child** - 1 - 2 L/min **O_2 concentration** - approx 45%
Oxygen face mask with reservoir bag	**Neonate / Infant / Child** - 10 - 15 L/min **O_2 concentration** - approx 80 - 90%

* Check for abdominal distension regularly.

Treatment of convulsions

Convulsions in the **first 1 month** of life should be treated with Phenobarbitone 20mg/kg stat, a further 5-10mg/kg can be given within 24 hours of the loading dose with maintenance doses of 5mg/kg daily.

Age > 1 month.



** **DO NOT** give a phenobarbitone loading dose to an epileptic on maintenance phenobarbitone

Diarrhoea / Gastroenteritis

Age ≥ 1 month (excluding severe malnutrition)

History of diarrhoea / vomiting, age ≥ 1 months

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

NB:If Hb<5g/dl, transfuse urgently

Yes

Ringer's 20 mls/kg
a second bolus may be given if required before proceeding to step 2 of Plan C (*see below*).
Treat for Hypoglycaemia

iv Step 1 - 30 mls/kg Ringer's
over 30 mins if age ≥ 12m OR
over 60 mins if age < 12m

No

SEVERE Dehydration
(Plan C)
Unable to drink or AVPU < A plus:

- sunken eyes
- return of skin pinch ≥ 2 secs

OR

iv Step 2 - 70 mls/kg Ringer's
over 2.5 hrs if age ≥ 12m OR
over 5 hrs if age < 12m

Start ORS at 5 mls/kg/hr once able to drink

ng rehydration - 120 mls/kg ORS over 6 hrs

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

No

SOME Dehydration
Able to drink adequately but **2 or more** of:

- sunken eyes
- return of skin pinch 1 - 2 secs
- restlessness / irritability

Yes

Plan B
1) ORS by mouth at 75 mls/kg over 4 hrs**, plus,**
2) Continue breast feeding as tolerated
Reassess at 4 hrs & treat according to classification

No

NO Dehydration
Diarrhoea with fewer than 2 of the above signs of dehydration

Yes

Plan A
1) 10mls/kg ORS after each loose stool
2) Continue breast feeding and encourage feeding if > 6 months

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

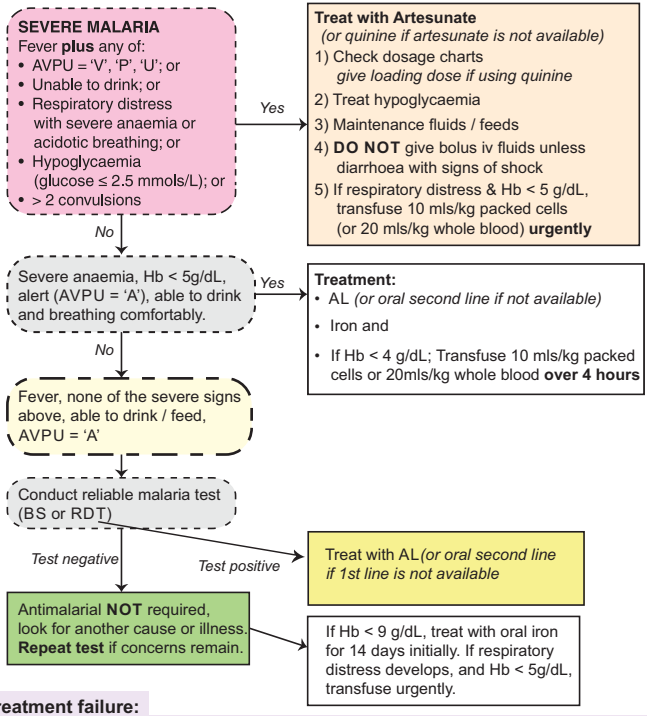
Dehydration management

(child WITHOUT severe malnutrition/severe anaemia)*

Weight (kg)	Shock, 20mls/kg Ringer's Immediately	Plan C – Step 1	Plan C – Step 2			Plan B - 75mls/kg
		30mls/kg Ringer's	**70mls/kg** Ringer's or ng ORS			Oral / ng 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*	**150**
2.50	50	**75**	*13*	**200**	*'adult' IV giving*	**150**
3.00	60	**100**	*13*	**200**	*sets where*	**200**
4.00	80	**100**	*20*	**300**	*20 drops=1ml*	**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*

If a high quality blood slide is negative with signs of **SEVERE** malaria, start presumptive treatment **BUT REPEAT** testing and **STOP** treatment if test is negative



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

Anti-malarial drug doses and preparation

*(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.*

Malaria treatment doses

- ***Artesunate*** is given IV / IM for a minimum of 24 hours
- ***As soon as*** the child can eat drink (after 24 hours for artesunate) then change to a ***full course*** of artemisinin combination therapy (ACT) typically the 1st line oral anti-malarial, Artemether Lumefantrine

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

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

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

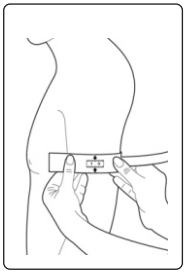
Weight	Age	Dose
< 5 kg	-	1/2 tablet
5 - 15 kg	3 - 35 mo	1 tablet
15 - 24 kg	3 - 7 yrs	2 tablets
25 - 34 kg	9 - 11 yrs	3 tablets

Dihydroartemisinin Piperaquine
OD for 3 days

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

Measuring nutritional status

Anthropometry (body measurement) quantifies malnutrition. In children, measurement of mid-upper arm circumference (MUAC) is the most simple. Weight and height measurements can be useful to detect wasting and stunting and individual monitoring over time e.g. growth velocity.



Mid upper arm circumference (MUAC)

MUAC is measured using a tape around the left upper arm. MUAC is quicker in sick patients so use MUAC in acute management.

Weight, Height and Age

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

In the diagnosis of acute malnutrition we use W/H ***expressed as Z scores***. Z - scores can be obtained from simple tables (*pg 51 & 52)*

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

Kwashiorkor = severe malnutrition *(at any age)*

Classifying malnutrition

(for WHZ values see pg 51 to 52)

Acute Malnutrition *(severity)*	MUAC *(mm)*	WHZ
None	>135	> - 1
At Risk	125 to 134	> - 2 to ≤ 1
Moderate	115 to 124	> - 3 to ≤ - 2
Severe	< 115	≤ - 3
	Kwashiorkor	

Complicated severe acute malnutrition

age 6 - 59 months

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

- MUAC < 115 mm (*or visible severe wasting if no MUAC*) with WHZ < 3 used if child aged < 6 months
- Oedema / other signs of Kwashiokor (*flaky pale skin/hair changes)*

Step 1

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

Step 2

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

Step 3

- Check for dehydration if has diarrhoea. If in shock, use IV fluids if not in shock use ReSoMal (see page 27)
- Transfuse *if Hb<4g/dL*, 10mls/kg whole blood in 3hrs + frusemide 1mg/kg (*for shock seen next page)*

Step 4

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

Step 5

All ill children with SAM should get iv Penicillin (*or Ampicillin*) **AND** Gentamicin. Give 5 days gentamicin, if improved change Pen to Amoxicillin 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 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*) 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.

Paediatric management guidelines

Fluid management
in severe malnutrition with diarrhoea

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

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

If not in shock or after treating shock

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

Weight (kg)	**Fluids for shock complicating malnutrition**		**Oral / ngt** ***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

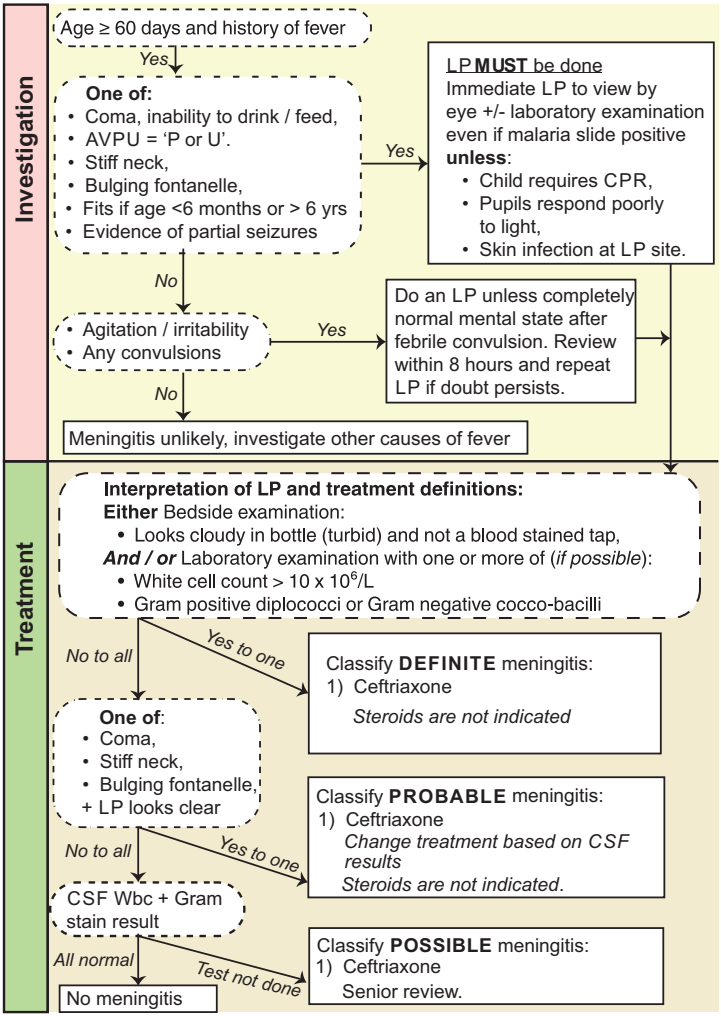
Feeding children with severe malnutrition

(age 6 - 59 months)

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

Weight (kg)	F75 – acute feeding				F100 Transition phase	RUTF Transition Phase	RUTF Rehabil'n Phase
	No or moderate oedema *(130mls/kg/day)*		Severe oedema, even face *(100mls/kg/day)*		Replace starter F-75 with an equal amount of catch-up F-100 for 2 days.		
	Total Feeds / 24 hrs	3 hourly feed volume	Total Feeds / 24 hrs	3 hourly feed volume	**F100 Rehabilitation phase**	Packets per 24hrs	Packets per 24hrs
4.0	520	65	400	50	On the third day if on F-100, increase each successive feed by 10 ml until some feed remains uneaten (usually at 200ml/kg/day). 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.	1.5	2.0
4.5	585	75	450	60		2.1	2.5
5.0	650	80	500	65			
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

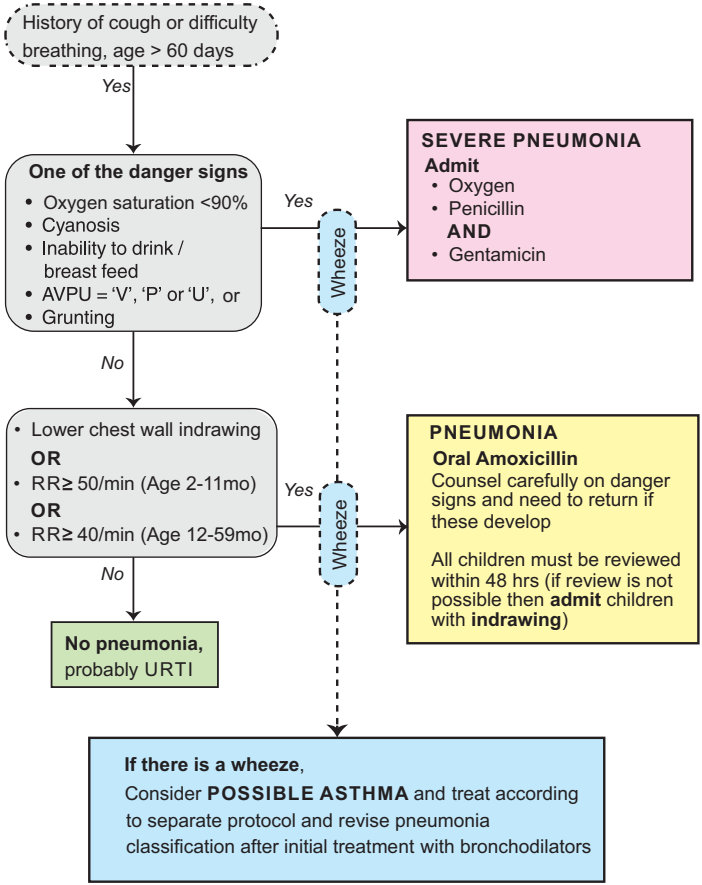
If respiratory distress or oedema gets worse or the jugular veins are engorged reduce feed volumes


Investigation
Age ≥ 60 days and history of fever
Yes
One of:
• Coma, inability to drink / feed,
• AVPU = 'P or U'.
• Stiff neck,
• Bulging fontanelle,
• Fits if age <6 months or > 6 yrs
• Evidence of partial seizures
Yes
LP MUST be done
Immediate LP to view by eye +/- laboratory examination even if malaria slide positive unless:
• Child requires CPR,
• Pupils respond poorly to light,
• Skin infection at LP site.
No
• Agitation / irritability
• Any convulsions
Yes
Do an LP unless completely normal mental state after febrile convulsion. Review within 8 hours and repeat LP if doubt persists.
No
Meningitis unlikely, investigate other causes of fever
Treatment
Interpretation of LP and treatment definitions:
Either Bedside examination:
• Looks cloudy in bottle (turbid) and not a blood stained tap,
And / or Laboratory examination with one or more of (if possible):
• White cell count > 10 x 10^6/L
• Gram positive diplococci or Gram negative cocco-bacilli
No to all
Yes to one
Classify DEFINITE meningitis:
1) Ceftriaxone
Steroids are not indicated
One of:
• Coma,
• Stiff neck,
• Bulging fontanelle,
+ LP looks clear
Classify PROBABLE meningitis:
1) Ceftriaxone
Change treatment based on CSF results
Steroids are not indicated.
No to all
Yes to one
CSF Wbc + Gram stain result
All normal
Test not done
Classify POSSIBLE meningitis:
1) Ceftriaxone
Senior review.
No meningitis

Pneumonia

for children aged 2-59 months without severe malnutrition

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 (pg 37); see TB page for PTB (page 34).

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 Staph. Aureus or Gram negative pneumonia.
48 hours	
Severe pneumonia child getting worse, re-assess thoroughly, get chest X ray if not already done *(looking for empyema/effusion, cavitation etc).* Pneumonia *without* improvement in at least **one** of: ✓ *Respiratory rate,* ✓ *Severity of indrawing,* ✓ *Fever,* ✓ *Ability to drink or feed.*	Switch to Ceftriaxone unless suspect Staphylococcal pneumonia then use flucloxacillin and gentamicin. *Suspect PCP especially if <12m, an HIV test **must** be done - treat for Pneumocystis if HIV positive* Admit the child. Change treatment from amoxicillin to penicillin and gentamicin.
Day 5.	
At least **three** of: ✓ *Fever, temp >38^{0}C* ✓ *Respiratory rate >60 bpm* ✓ *Still cyanosed or saturation <90% and no better than admission* ✓ *Chest in drawing persistent* ✓ *Worsening CXR*	• If only on amoxicillin, admit the child and change to penicillin and gentamicin • If on penicillin and gentamicin change to ceftriaxone. • Suspect PCP, an HIV test **must** be done - treat for Pneumocystis if HIV positive.
After 1 week.	
Persistent fever and respiratory distress.	Consider TB, perform mantoux and check TB treatment guidelines.

Possible asthma

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

Yes

Severe Asthma
Any one of these;

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

Yes

Immediate Management
ADMIT
Oxygen
Nebulize 2.5 mg salbutamol or 6 puffs of inhaler with spacer and mask give every 20 minutes for 3 doses if needed
Prednisolone 2mg/kg*
Consider ipratropium bromide 250 mcg if poor response**
Antibiotics as for severe pneumonia

No

Mild or Moderate Asthma
Wheeze PLUS

- Lower chest wall indrawing
  OR
- RR ≥ 50/min (Age 2 -11 mo)
- RR ≥ 40/min (Age 12- 59 mo)
- RR ≥ 30/min (Age 5 -12 yrs)

Yes

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

Monitor closely for 1-2 hours

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

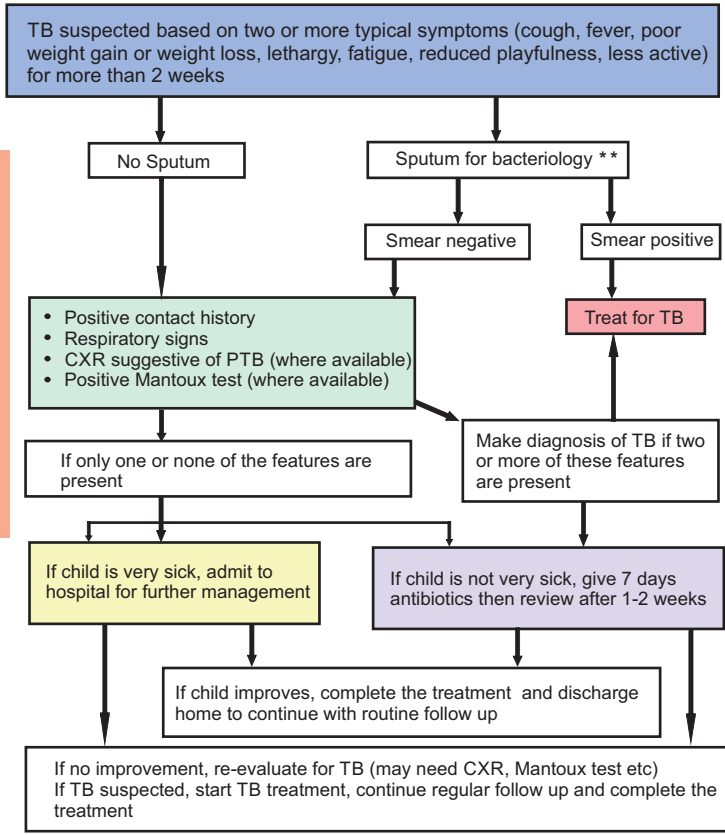
If lack of response to salbutamol, increasing respiratory rate, worsening saturation, any signs of severe asthma. Refer to Immediate Management above.

Recurrence of asthma symptoms consider Inhaled corticosteroid (ICS) therapy or adjust the doses if already on ICS. ***(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
Advise on regular follow up.

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

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

ALGORITHM FOR DIAGNOSIS OF TB IN CHILDREN*



** Division of Leprosy, TB & Lung Disease, Ministry of Public Health and Sanitation. Tuberculosis management in children. 2nd ed. Nairobi, Kenya: MPHS, 2014.*

*** Microscopy for ZN, TB culture, GeneXpert*

Regimens and dosing

TB disease category	Recommended regimen	
	Intensive phase	Continuation phase
All forms of TB except TB meningitis, bone and joint TB	2 months RHZE	4 months RH
TB meningitis Bone and joint TB	2 months RHZE	10 months RH

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

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

TB drug doses

Drug	Recommendations Average daily dose in mg/kg	Range in mg/kg	Maximum Dose
Isoniazid	10	10 – 15	300 mg
Rifampicin	15	10 – 20	600 mg
Pyrazinamide	35	30 – 40	1.5 g
Ethambutol	20	15 – 25	1.6 g

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

Provider Initiated Testing and Counselling, Treatment and Feeding

It is government policy that **ALL SICK CHILDREN** presenting to facilities with unknown status should be offered HIV testing using ***PITC.***

PITC is best done on admission when other investigations are ordered. All clinicians should be able to perform PITC and discuss a positive / negative result.

Below is a quick guide to PITC

- ✓ As much as possible find a quiet place to discuss the child's admission diagnosis, tests and treatment plans.
- ✓ After careful history / examination plan all investigations and then inform caretaker what tests are needed and that HIV is common in Kenya.
- ✓ Explain GoK guidance that ALL sick children with unknown status should have an HIV test - so that their child is not being 'picked out'.
- ✓ That in this situation it is **normal** to do an HIV test on a child because:
  - o You came to hospital wanting to know what the problem was and find the best treatment for it.
  - o Knowing the HIV test result gives doctors the best understanding of the illness and how to treat it.
  - o The treatment that is given to the child will change if the child has HIV.
  - o If the child has HIV s/he will need additional treatment for a long time and the earlier this is started the better.
- ✓ That the HIV test will be done with their approval and not secretly.
- ✓ That the result will be given to them and that telling other family / friends is their decision.
- ✓ That the result will be known only by doctors / nurses caring for the child as they need this knowledge to provide the most appropriate care.
- ✓ Give the parent / guardian the opportunity to ask questions.

***The person asking permission for HIV testing should then write in the medical record that permission was given / refused*.**

Any child < 18 months with a positive rapid test is HIV exposed and is treated as though infected until definitive testing rules out HIV infection.

Ongoing treatment/feeding

1) If breast fed encourage exclusive breast feeding until 6 months. If an alternative to breast feeding is affordable, feasible, accessible, safe and sustainable (AFASS) discuss this option before delivery.
2) Do not abruptly stop breast feeding at 6 months, just add complementary feeds and continue nevirapine until 1 week after breast feeding stops.
3) Refer child and carers to an HIV support clinic.
4) All HIV exposed / infected infants should start CTX prophylaxis from age 6 wks.

	Scenario	Infant ARV prophylaxis	Duration of infant ARV prophylaxis
1	Mother diagnosed with HIV during pregnancy at any gestation, labour, delivery and immediate post-partum irrespective of feeding option	Nevirapine	• Immediately initiate Nevirapine (NVP) prophylaxis for 12 weeks • Do HIV PCR test in accordance with national recommendations on early infant diagnosis; • Initiate treatment if the infant is infected
2	Infant identified as HIV exposed after birth (through infant or maternal HIV antibody testing) and is breastfeeding	Nevirapine	• Immediately initiate NVP prophylaxis • Do HIV PCR test in accordance with national recommendations on early infant diagnosis • If results positive, initiate ART and stop NVP prophylaxis • If results negative, continue NVP prophylaxis up to 12 weeks
3	Infant identified as HIV exposed after birth (through infant or maternal HIV antibody testing) and is not breastfeeding/on replacement feeding	No drug	• Do HIV PCR test in accordance with national recommendations on early infant diagnosis; • No infant ARV prophylaxis; • Initiate treatment if the infant is infected
4	Mother receiving ART but interrupts ART regimen while breastfeeding (such as toxicity, stock-outs or refusal to continue)	Nevirapine	• Initiate NVP until 12 weeks after maternal ART is restarted or until 1 week after breastfeeding has ended if mother does not restart ART • Do HIV PCR test in accordance with national recommendations on early infant diagnosis

** Ministry of Health; National AIDS and STI Control Program (NASCOP). Guidelines on Use of Antiretroviral Drugs for Treating and Preventing HIV Infection: A rapid advice, 2014*

PMTCT Nevirapine Prophylaxis:

Age	Nevirapine Dosing
0 - 6 wks	10 mg (*1ml*) once daily (*Birth weight ≤ 2,500 grams)* 15 mg (*1.5ml*) once daily (*Birth weight > 2,500 grams)*
6 - 14 wks	20 mg (2mls) once daily
14 wks - 6 months	25 mg (2.5mls) once daily
6 - 9 months	30 mg (3mls) once daily

Pneumonia

All HIV exposed / infected children admitted with signs of severe pneumonia or 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	CTX Tabs 120mg/tab	CTX Tabs 480mg/tab	Frequency
1 - 4 kg	2.5 mls	1 tab	1/4	***24 hrly*** for prophylaxis, ***8 hrly*** for 3 wks for PCP treatment
5 - 8 kg	5 mls	2 tabs	1/2	
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

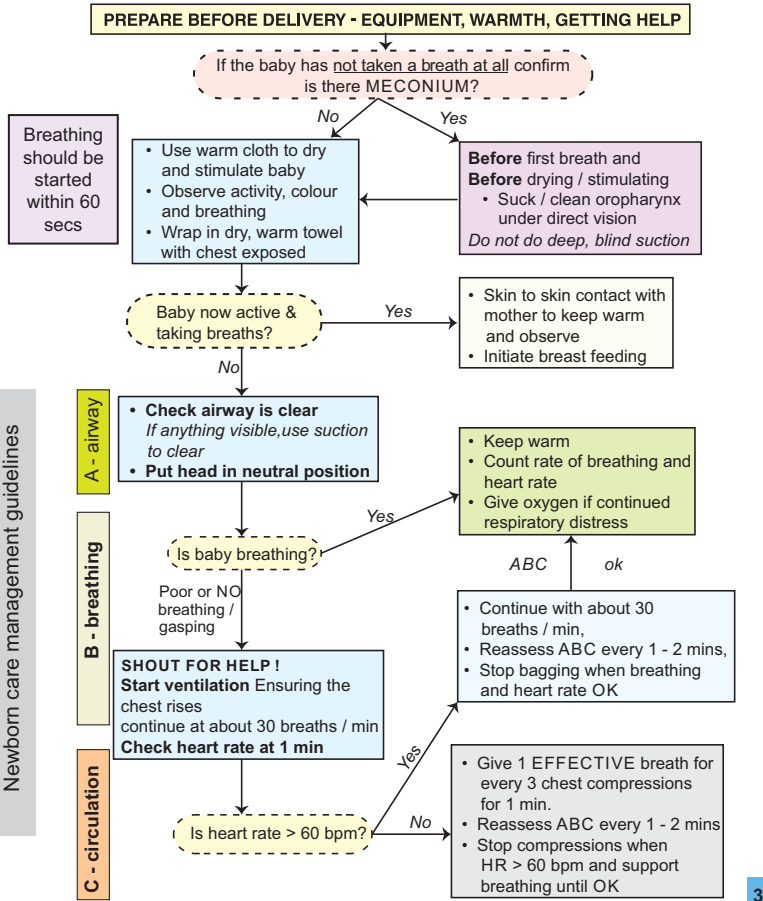
TB - See national guidelines for TB treatment in an HIV exposed / positive child

Newborn Resuscitation

For trained health workers - Be prepared

Note for all newborns:

- ✓ Practice delayed cord clamping to prevent early infant anaemia
- ✓ Clean the cord with 7.1% Chlorhexidine Digluconate (4% Chlorhexidine) once baby stable and then daily until the cord separates
- ✓ Ensure HIV risk known and give TEO & Vitamin K



Newborn care management guidelines

Neonatal Sepsis

see page 50 for Newborn Antibiotic doses

Age < 60 days

Yes

One or more of:

- ***Change in level of activity***
- ***Bulging fontanelle***
- ***History of convulsions***
- ***Feeding difficulty***

Yes → Do LP unless severe respiratory distress

- Temperature ≥ 37^{0}C or < 35.5 ^{0}C
- Fast breathing / respiratory rate ≥ 60 bpm
- Severe chest wall indrawing
- Grunting
- Cyanosis/Pulse oximetry

Yes →

1) Check for hypoglycaemia, treat *if unable to measure glucose*
2) Start gentamicin and penicillin *(see chart on page 50*
3) Give oxygen if cyanosed / respiratory rate > 60 bpm
4) Give Vitamin K *if born at home or not given at maternity*
5) Keep warm
6) Maintain feeding by mouth or ng, use iv fluids only if respiratory distress or severe abdominal distension *(see charts on page 46-49)*

Also check

- Jaundice (*see page 41-43)*
- Capillary refill
- Severe pallor
- PROM > 18 hrs *if aged <7d*
- Localized severe infection - joints, abdominal distension
- Weight loss

DECIDE - does the baby need fluids, feeds or blood (pages 46-49)

No signs of serious illness

Is there

- Pus from the eye;
- Pus from the ear;
- Pus from umbilicus and redness of abdominal skin; or
- Few **large**, pus-filled blisters / septic spots.

→

Where appropriate:

1) Treat for neonatal ophthalmia
2) Treat with oral antibiotic - one that covers Staph aureus if large, pus-filled septic spots
3) Give mother advice and arrange review

Duration of treatment for neonatal sepsis

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

Antibiotic prophylaxis

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

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

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

Neonatal Jaundice

- ✓ Assess for jaundice in bright, natural light if possible, check the eyes, blanched skin on nose and the sole of the foot
- ✓ Always measure serum bilirubin if age < 24 hours and if clinically moderate or severe - Any jaundice in a new born aged <24 hrs needs further investigation and treatment
- ✓ **Refer early if jaundice in those aged <24 hrs and facility cannot provide phototherapy and exchange transfusion**
- ✓ See next page for guidance on bilirubin levels
- ✓ ***If bilirubin measure unavailable*** start phototherapy:
  - In a well-baby with jaundice easily visible on the sole of the foot
  - In a preterm baby with ANY visible jaundice
  - In a baby with easily visible jaundice and inability to feed or other signs of neurological impairment ***and consider immediate exchange transfusion***

Stop phototherapy - when bilirubin 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***
3. ***Place the baby close to the light source*** - 45 cm distance is often recommended but the more light power the baby receives the better the effect so closer distances are OK if the baby is not overheating especially if need rapid effect. May use white cloth to reflect light back onto the baby making sure these do not cause overheating.
4. ***Do not place anything on the phototherapy devices*** - lights and baby need to keep cool so do not block air vents / flow or light. Also keep device clean - dust can carry bacteria and reduce light
5. ***Promote frequent breast feeding***. Unless dehydrated ***supplements or intravenous fluids are unnecessary***. Phototherapy use can be interrupted for feeds; allow maternal bonding.
6. ***Periodically change position supine to prone*** - Expose the maximum surface area of baby to phototherapy; may reposition after each feed.
7. ***Monitor temperature*** every 4 hrs and weight every 24 hrs.
8. ***Periodic (12 to 24 hrs) plasma/serum bilirubin test***. Visual testing for jaundice or transcutaneous bilirubin is unreliable.
9. ***Make sure that each light source is working*** and emitting light. Fluorescent tube lights should be replaced if:
   a. More than 6 months in use (or usage time >2000 hrs)
   b. Tube ends have blackened
   c. Lights flicker

Jaundice treatment

if 37 weeks or more gestational age

Bilirubin measurement in micromol/L				
Age (in hours - round age up to nearest threshold given)	**Repeat measurement in 6 hours**	**Consider phototherapy** - especially if risk factors - and repeat in 6 hours	**Initiate phototherapy**	**Perform an exchange transfusion** unless the bilirubin level falls below threshold while the treatment is being prepared
0	-	-	>100	>100
6	> 100	> 112	> 125	> 150
12	> 100	> 125	> 150	> 200
18	> 100	> 137	> 175	> 250
24	> 100	> 150	> 200	> 300
30	> 112	> 162	> 212	> 350
36	> 125	> 175	> 225	> 400
42	> 137	> 187	> 237	> 450
48	> 150	> 200	> 250	> 450
54	> 162	> 212	> 262	> 450
60	> 175	> 225	> 275	> 450
66	> 187	> 237	> 287	> 450
72	> 200	> 250	> 300	> 450
78	-	> 262	> 312	> 450
84	-	> 275	> 325	> 450
90	-	> 287	> 337	> 450
96+	-	> 300	> 350	> 450

Jaundice treatment

if < 37 weeks gestational age

✓**Any jaundice within 24 hours is of concern** and should prompt rapid treatment and a careful look for underlying causes

✓The table below is a quick guide, more detailed information can be found at:

http://guidance.nice.org.uk/CG98/treatmentthresholdgraph/xls/English

	Estimated Gestational Age					
	Age in hours	28 weeks	30 weeks	32 weeks	34 weeks	36 weeks
		All values in micromol/L				
Start Phototherapy	12 hrs	Any value above normal range				
	24 hrs	80	90	100	110	110
	36 hrs	110	120	130	140	150
	48 hrs	140	150	160	170	180
	60 hrs	160	170	190	200	220
	72 hrs +	180	200	220	240	260
Exchange Transfusion	12 hrs	**120**	**120**	**120**	**120**	**120**
	24 hrs	**150**	**150**	**160**	**160**	**170**
	36 hrs	**180**	**180**	**200**	**210**	**220**
	48 hrs	**210**	**220**	**240**	**250**	**260**
	60 hrs	**240**	**260**	**280**	**290**	**310**
	72 hrs +	**280**	**300**	**320**	**340**	**360**

Fluids, growth, vitamins and minerals in the newborn

Babies should gain about 10g/kg of body weight every day after the first 7 days of life. If they are not check that the right amount of feed is being given.

All infants aged <14 days should receive Vitamin K on admission if not already given.

Vitamin K

- All babies born in hospital should receive Vitamin K soon after birth
- 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***

Kangaroo mother care (KMC)

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

All premature infants (< 36 weeks or < 2kg) should receive:

- 2.5 mls of multivitamin syrup daily once they are on full milk feeding at the age of about 2 wks plus folate 2.5mg weekly
- Give iron supplementation *(refer to page 7 for dosages)*

Continuous Positive Airway Pressure (CPAP)

(For maximum benefit start as soon as symptoms are identified)

Newborn with severe respiratory distress with all of these

Weight of >1000gm,
APGAR score of ≥ 4 at 5 minute and
Respiratory distress defined as a Silverman Anderson Score of ≥ 4*

Defer CPAP if any of the following

Uncontrollable seizures,
Floppy infant or
Apnoeic or gasping respiration

Initiate CPAP

Monitor **every three hours**

- Vital signs – Temperature, Heart rate and Respiratory Rate
- Pulse Oximetry
- Silverman Anderson Scoring
- Need of Nasal clearing/Suction

Worsening signs & score

- Ensure the CPAP seal and equipment is working well
- Senior Review for further evaluation

Improving signs & score

Continue CPAP and Monitor until Silverman Anderson score of <4

Transition from CPAP to Oxygen by Nasal Prongs

Silverman- Anderson Score			
Feature	**Score 0**	**Score 1**	**Score 2**
Chest Movement	Equal	Respiratory Lag	Seesaw Respiration
Intercostal Retraction	None	Minimal	Marked
Xiphoid Retraction	None	Minimal	Marked
Nasal Flaring	None	Minimal	Marked
Expiratory Grunt	None	Audible with Stethoscope	Audible

*Score of >6 initiate CPAP as you prepare for transfer for mechanical ventilation
(For instruction on how to set up CPAP, refer to CPAP training/equipment manuals)

Newborn ≥ 1.5kg: Feeding / Fluid requirements

- ✓ **Well baby** - Immediate milk feeding -**Table A**. For first feed give 7.5mls and increase by this amount each feed until full daily volume reached
- ✓ **Day 1 - Sick baby** start with 24hrs iv 10%D –**Table B**
- ✓ **From Day 2** unless baby very unwell start NGT feeds - Begin with 7.5mls 3hrly if ≥1.5kg & <2kg; and 10mls 3hrly if ≥ 2kg. Increase feed by the same amount **every day** and reduce iv fluids to keep within the total daily volume until IVF stopped – **Table C**
- ✓ For IV fluids from Day 2 Add Na+ 2-3mmol/kg/day (19mls/kg of normal saline) and K+ 1-2mmol/kg/day (1ml/kg of KCL) to 10% glucose solution.
- ✓ Always feed with EBM unless contra-indicated
- ✓ If signs of poor perfusion or fluid overload please ask for senior opinion on whether to give a bolus, step-up or step-down daily fluids.

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

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

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

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

Weight (kg)	1.5	1.6 to 1.7	1.8 to 1.9	2.0 to 2.1	2.2 to 2.3	2.4 to 2.5	2.6 to 2.7	2.8 to 2.9	3.0 to 3.1	3.2 to 3.3	3.4 to 3.5	3.6 to 3.7	3.8 to 3.9
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
Day 6	10	11	13	14	15	17	18	19	21	22	23	25	26
Day 7+	11	13	14	16	17	19	20	22	23	25	26	28	29

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

Weight (kg)	1.5		1.6 - 1.7		1.8 - 1.9		2.0 - 2.1		2.2 - 2.3		2.4 - 2.5		2.6 - 2.7		2.8 - 2.9	
	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed
Day 1	4	0	4	0	5	0	5	0	6	0	6	0	7	0	7	0
Day 2	3	5	3	8	4	8	4	10	4	10	5	10	6	10	6	10
Day 3	3	10	2	15	3	15	2	20	3	20	4	20	5	20	5	20
Day 4	3	15	1	22	2	22	0	30	2	30	3	30	4	30	5	30
Day 5	2	20	0	30	1	30	0	36	0	39	1	40	2	40	4	40
Day 6	2	25	0	34	0	38	0	42	0	45	0	50	1	50	3	50
Day 7+	0	33	0	38	0	42	0	48	0	51	0	56	0	60	0	65

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

- **Day 1 - Sick baby** (convulsions, unconscious, severe respiratory distress evidenced by severe chest wall indrawing, absent bowel sounds) start iv 10%D for 24hrs - If you think iv feeding is unsafe then start immediate ng feeding with colostrum
- Feeding should start on Day 2unless baby is unwell with EBM at 5 mls; increase 3 hourly feed volumes by 5 mls each day and reduce iv fluids to keep within the total daily volume until IVF stopped until full 3 hourly feed volume achieved appropriate for weight and post-natal age in days
- For IV fluids from Day 2 Add Na+ 2-3mmol/kg/day (19mls/kg of normal saline) and K+ 1-2mmol/kg/day (1ml/kg of KCL) to 10% glucose solution
- Always feed with EBM unless contra-indicated
- It may be possible to increase volumes further to as much as 200mls/kg/day but seek expert advice.

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 Newborns < 1.5 kg: *Using a burette / soluset with 60 drops =1ml then drip rate = mls/hr*

Standard regimen for introducing NGT feeds after first 24 hours IV fluid for Newborns < 1.5 kg: sick newborns

Weight (kg)	0.8 to 0.9	0.9 to 1.0	1.1. to 1.2	1.3 to 1.4	1.4 to 1.5
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
Day 6	7	8	8	10	11
Day 7+	7	8	8	10	11

Weight (kg)	0.8 - 0.9		0.9 - 1.0		1.1 - 1.2		1.3 - 1.4		1.4 - 1.5	
	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed	IVF mls per hr	NGT 3hrly feed
Day 1	3	0	3	0	4	0	3	0	4	0
Day 2	2	5	3	5	3	5	4	5	5	5
Day 3	1	10	2	10	2	10	3	10	4	10
Day 4	0	15	1	15	1	15	3	15	4	15
Day 5	0	16	0	18	0	22	2	26	3	28
Day 6	0	18	0	20	0	25	1	29	3	30
Day 7+	0	21	0	22	0	27	0	32	0	35

Newborn < 1.5kg: Feeding requirements (well newborns)

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

Always use EBM for NGT feeds unless contra-indicated

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

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

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

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

Newborn antibiotic doses

Intravenous / intramuscular antibiotics aged ≤ 7 days

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

Oral antibiotics aged ≤ 7 days

Weight (kg)	Amoxycillin 25 mg/kg **125mg/5mls** 12 hrly	Ampicillin / Flucloxacillin 25 mg/kg **125mg/5mls** 12 hrly
2.00	2	2
2.50	3	3
3.00	3	3
4.00	4	4

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

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

Warning:

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

Weight for length / height charts (1)

Length (cm)	Weight (kg)							
	Boys				Girls			
	– 3SD	–2SD	–1SD		– 3SD	–2SD	–1SD	
45	1.9	2	2.2	For children who have a weight for height that is not ≤ -1 then classify as 'normal'.	1.9	2.1	2.3	For children who have a weight for height that is not ≤ -1 then classify as 'normal'.
46	2	2.2	2.4		2	2.2	2.4	
47	2.1	2.3	2.5		2.2	2.4	2.6	
48	2.3	2.5	2.7		2.3	2.5	2.7	
49	2.4	2.6	2.9		2.4	2.6	2.9	
50	2.6	2.8	3		2.6	2.8	3.1	
51	2.7	3	3.2		2.8	3	3.3	
52	2.9	3.2	3.5		2.9	3.2	3.5	
53	3.1	3.4	3.7		3.1	3.4	3.7	
54	3.3	3.6	3.9		3.3	3.6	3.9	
55	3.6	3.8	4.2		3.5	3.8	4.2	
56	3.8	4.1	4.4		3.7	4	4.4	
57	4	4.3	4.7		3.9	4.3	4.6	
58	4.3	4.6	5		4.1	4.5	4.9	
59	4.5	4.8	5.3		4.3	4.7	5.1	
60	4.7	5.1	5.5		4.5	4.9	5.4	
61	4.9	5.3	5.8		4.7	5.1	5.6	
62	5.1	5.6	6		4.9	5.3	5.8	
63	5.3	5.8	6.2		5.1	5.5	6	
64	5.5	6	6.5		5.3	5.7	6.3	
65	5.7	6.2	6.7		5.5	5.9	6.5	
66	5.9	6.4	6.9		5.6	6.1	6.7	
67	6.1	6.6	7.1		5.8	6.3	6.9	
68	6.3	6.8	7.3		6	6.5	7.1	
69	6.5	7	7.6		6.1	6.7	7.3	
70	6.6	7.2	7.8		6.3	6.9	7.5	
71	6.8	7.4	8		6.5	7	7.7	
72	7	7.6	8.2		6.6	7.2	7.8	
73	7.2	7.7	8.4		6.8	7.4	8	
74	7.3	7.9	8.6		6.9	7.5	8.2	
75	7.5	8.1	8.8		7.1	7.7	8.4	
76	7.6	8.3	8.9		7.2	7.8	8.5	
77	7.8	8.4	9.1		7.4	8	8.7	

Weight for length / height charts (2)

Length (cm)	Weight (kg)							
	Boys				Girls			
	– 3SD	–2SD	–1SD		– 3SD	–2SD	–1SD	
78	7.9	8.6	9.3	For children who have a weight for height that is not ≤ -1 then classify as 'normal'.	7.5	8.2	8.9	For children who have a weight for height that is not ≤ -1 then classify as 'normal'.
79	8.1	8.7	9.5		7.7	8.3	9.1	
80	8.2	8.9	9.6		7.8	8.5	9.2	
81	8.4	9.1	9.8		8	8.7	9.4	
82	8.5	9.2	10		8.1	8.8	9.6	
83	8.7	9.4	10.2		8.3	9	9.8	
84	8.9	9.6	10.4		8.5	9.2	10.1	
85	9.1	9.8	10.6		8.7	9.4	10.3	
86	9.3	10	10.8		8.9	9.7	10.5	
87	9.5	10.2	11.1		9.1	9.9	10.7	
88	9.7	10.5	11.3		9.3	10.1	11	
89	9.9	10.7	11.5		9.5	10.3	11.2	
90	10.1	10.9	11.8		9.7	10.5	11.4	
91	10.3	11.1	12		9.9	10.7	11.7	
92	10.5	11.3	12.2		10.1	10.9	11.9	
93	10.7	11.5	12.4		10.2	11.1	12.1	
94	10.8	11.7	12.6		10.4	11.3	12.3	
95	11	11.9	12.8		10.6	11.5	12.6	
96	11.2	12.1	13.1		10.8	11.7	12.8	
97	11.4	12.3	13.3		11	12	13	
98	11.6	12.5	13.5		11.2	12.2	13.3	
99	11.8	12.7	13.7		11.4	12.4	13.5	
100	12	12.9	14		11.6	12.6	13.7	
101	12.2	13.2	14.2		11.8	12.8	14	
102	12.4	13.4	14.5		12	13.1	14.3	
103	12.6	13.6	14.8		12.3	13.3	14.5	
104	12.8	13.9	15		12.5	13.6	14.8	
105	13	14.1	15.3		12.7	13.8	15.1	
106	13.3	14.4	15.6		13	14.1	15.4	
107	13.5	14.6	15.9		13.2	14.4	15.7	
108	13.7	14.9	16.2		13.5	14.7	16	
109	14	15.1	16.5		13.7	15	16.4	
110	14.2	15.4	16.8		14	15.3	16.7	

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 booklet.

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 **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.
1 – 3 weeks	3.0	
4 - 7 weeks	4.0	
2 - 3 months	5.0	
4 - 6 months	7.0	
7 to 9 months	9.0	
10 to 12 months	10.0	
1 to 2 yrs	11.0	
2 to 3 yrs	13.0	
3 to 4 yrs	15.0	
4 to 5 yrs	17.0	

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BASIC PAEDIATRIC PROTOCOLS

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4th Edition