BASIC PAEDIATRIC PROTOCOLS

for ages up to 5 years

November 2013 Edition

Ministry of Health

Republic of Kenya.

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Foreward

This pocket book is mainly aimed at doctors, clinical officers, nurses and other health workers who are responsible for the care of sick newborns and young children. We hope it helps people at all levels although it mainly targets those having to provide basic hospital care . The guidelines consider such facilities should have:- (1) capacity to do certain essential investigations such as blood smear for malaria parasites, estimation of haemoglobin or packed cell volume, blood glucose, blood grouping and cross matching, basic microscopy of CSF and urine, bilirubin determination for neonates, and chest X-rays and (2) essential drugs available for the care of seriously sick children. They are not aimed at tertiary or university hospitals although we hope they may be found useful for less experienced practitioners even in such settings for defining basic, evidence-informed care.

These guidelines focus on the 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, neonatal and related conditions. Specifically they target management of the seriously ill newborn or child in the first 24 - 48 hours of arrival at hospital. The guidelines are based on specific and up to date reviews of evidence informing national recommendations for many topics or are drawn from international best practice advice such as that found in the WHO Book, “A Pocket Book of Hospital Care for Children” (2013 Edition).

We hope this handy pocket sized booklet will also be useful to students in medical schools and other training institutions. The simplified algorithms in this book can be enlarged and used as job aides in casualty, outpatients, paediatric wards, delivery rooms and newborn units. Guidelines of this nature will require 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 website: www.idoc-africa.org

We thank the Ministry of Health, the KEMRI-Wellcome Trust Research Programme, the Kenya Paediatric Association and the SIRCLE Collaboration for assisting in updating the guidelines.

Dr. Francis Kimani
Director of Medical Services
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 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 without thinking.

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 needs to be avoided.

10) An appropriate discharge and follow up plan needs to be made when 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 a legal document 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.
- ✓ Mid-Upper Arm Circumference (MUAC) is the most appropriate and rapid means to assess for severe malnutrition.
- ✓ Length / Height should be measured with weight for height (WHZ) recorded and used to monitor nutritional status & growth.
- ✓ 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 a the GCS 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 (eg. cot sides, stethoscopes).*

Hand hygiene technique

Hand Hygiene Technique with Alcohol-Based Formulation

Duration of the entire procedure: 20-30 seconds

1a

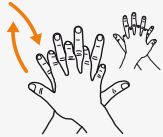
Apply a palmful of the product in a cupped hand, covering all surfaces;

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;

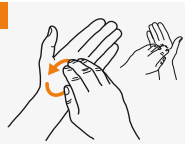
5

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.

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, nutrition 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 (eg 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 in resuscitation. *To make this strength dilute 1 ml of 1 in 1000 adrenaline in 9 mls water for injection to make 10mls.*
Albendazole	**Age < 2yrs**, 200mg stat **Age ≥ 2yrs**, 400mg stat
Amikacin	**Age 1mo to 18 yrs,** 15mg/kg once daily; same dosing can be used in newborns. Ideally Amikacin trough concentration should be monitored (*if available*). If serious gram –ve infection / resistance to gentamicin higher doses may be used with monitoring
Aminophylline (*iv)* *ONLY used in hospital inpatients!*	**Newborn** Loading dose 6mg/kg iv over 1 hour or rectal, **Maintenance (iv or oral)**: *Age 0-7 days* - 2.5mg/kg 12hrly, *Age 7-28 days* - 4mg/kg 12hrly. **Asthma:** 6mg/kg iv first dose over 30 mins
Amoxicillin	Use 25mg/kg/dose for simple infections and 40-45mg/kg for pneumonia (*Neonate Page 42, other Page 14)*
Ampicillin	**Newborn:** 50mg/kg/dose 12 hourly iv or im if aged <7days and 8 hourly if aged 7 – 28 days. **Age 1m and over:** 50mg/kg/dose 6 hourly iv / im
Artemether - Lumefantrine	*Page 26*
Artemisinin - Piperaquine	*Page 26*
Artesunate	**Age 1m and over:** 2.4mg/kg given iv/im at 0, 12 and 24 hours then daily – change to ***full course*** oral ACT as soon as possible after 3 doses when infant/child drinking/breast feeding. *See page 26*
Beclomethasone	**Age < 2yrs** *50-100 micrograms 12hrly,* **Age ≥ 2yrs** 100-200 *micrograms 12hrly.* *Can double doses to improve control but check technique and follow up carefully*
Benzyl Penicillin *(X-pen)*	**Newborn:** 50,000 iu/kg/dose 12 hourly iv or im. **Age 7 days and over:** 50,000 iu/kg/dose 6 hourly iv / im *Neonate Page 47, other Page 14*
Calcium *(Monitor calcium especially if on Vitamin D or long term therapy)*	**Newborns and up to 4 yrs:** 0.25mmol/kg 6 hrly. Calcium Gluconate 1g tabs contain 2.23mmol calcium; Calcium Lactate 300mg tabs contain 1mmol calcium *May be required together with Vitamin D for treating rickets in first 7 days* ***but monitor calcium to prevent*** *hypercalcaemia*

Essential Drugs	Doses *(For overweight children, base dose calculation on median weight for age or height)*
Carbamazepine	**Age 1 m –12 yrs**: 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 - watch carefully for side effects and change treatment if concerns*
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
Ceftriaxone	*Neonate Page 47, other Page 14*
Chloramphenicol	*Page 14 and 15*
Ciprofloxacin *(oral)*	***Dysentery dosing:*** Page 14 (*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 *pneumonia dosing* *(4mg/kg Trimethoprim & 20mg/kg sulphamethoxazole)*	**Weight** / **240mg/5ml (syrup)** *12hrly* / **480mg (tabs)** *12hrly* **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	0.6mg/kg stat *for severe croup*
Dextrose/glucose	5mls/kg 10% dextrose iv over 3-5 mins, *page 12* **Newborn**: 2 mls/kg
Dihydrocodeine	**Age 1–4 yrs**: 0.5mg / kg every 4–6 hours **Age 4–12 yrs**: 0.5–1 mg/kg (max. 30 mg) every 4–6 hrs
Diazepam (*iv*)	0.3mg/kg (=300 mcg/kg) & *See separate chart*
Diazepam (*rectal*)	0.5mg/kg (=500 mcg/kg) & *See separate chart*
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 10–18 yrs**: initially 0.75–1.5 mg in 3 divided doses for 24 hrs then 62.5–250 micrograms daily in 1–2 doses

<table>
<tr><th>Essential Drugs</th><th>Doses (For overweight children, base dose calculation on median weight for age or height)</th></tr>
<tr><td>Flucloxacillin</td><td>Neonate Page 47, other Page 15</td></tr>
<tr><td>Frusemide</td><td>0.5 to 1 mg/kg up to 6 hrly</td></tr>
<tr><td>Gentamicin</td><td>Neonate Page 47, other Page 14</td></tr>
<tr><td>Hydroxyurea</td><td>(for severe SCD only: Pain >3 episodes/yr; stroke; transfusion ≥2/yr; acute chest syndrome)
Use as directed by a paediatrician:
20mg / kg daily – Hb and white cells with neutrophil count must be done monthly.
Stop treatment and consult specialist if neutrophils reduced.</td></tr>
<tr><td>Ibuprofen</td><td>5 - 10 mg/kg 8 hourly</td></tr>
<tr><td>Iron tabs / syrup
200mg Ferrous sulphate tabs

140mg /5mls Ferrous fumarate syrup</td><td>
<table>
<tr><th>Weight</th><th>200mg tabs (twice daily)</th><th>Syrup 140mg/5mls (twice daily)</th></tr>
<tr><td>3 - 6 kg</td><td>-</td><td>2.5 mls</td></tr>
<tr><td>7 - 9 kg</td><td>1/4</td><td>5 mls</td></tr>
<tr><td>10 - 14 kg</td><td>1/2</td><td>10 mls</td></tr>
<tr><td>15 - 20 kg</td><td>1/2</td><td>15 mls</td></tr>
</table>
</td></tr>
<tr><td>Lactulose</td><td>Age 1m – 1 yr: 2.5 mL twice daily, adjusted according to response
Age 1 – 5 yrs: 2.5–10 mL twice daily, adjusted according to response</td></tr>
<tr><td>Mebendazole</td><td>(for age > 1 yr) 100mg bd for 3 days or 500mg stat</td></tr>
<tr><td>Metronidazole (oral)</td><td>Neonate Page 47, other Page 14</td></tr>
<tr><td>Morphine</td><td><1m: 0.15mg/kg, 1 - 5yrs: 2.5 - 5 mg,
1-11m: 0.2mg/kg, 6 – 12 yrs: 5 – 10 mg</td></tr>
<tr><td>Multivitamins</td><td>Age <6 m: 2.5mls daily;
Age > 6m: 5mls 12 hrly</td></tr>
<tr><td>Nystatin</td><td>(100,000 iu/ml) 1ml 6hrly (2 weeks if HIV +ve)</td></tr>
<tr><td>Paracetamol</td><td>10-15mg / kg 6 to 8 hrly</td></tr>
<tr><td>Pethidine, im</td><td>0.5 to 1mg / kg every 4- 6 hours</td></tr>
<tr><td>Phenobarbitone</td><td>Loading with 15mg/kg (assuming not on maintenance phenobarb) followed by 2.5mg – 5mg/kg daily, Page 13</td></tr>
<tr><td>Phenytoin</td><td>Age 1m–12 yrs, 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.</td></tr>
</table>

Essential Drugs	Doses *(For overweight children, base dose calculation on median weight for age or height)*
Potassium - *oral*	1 - 4 mmol/kg/day
Prednisolone - *tabs*	Asthma 1mg / kg daily *(usually for 3 – 5 days, stopped when symptoms largely resolved)*
Quinine	*Page 26*
Salbutamol *IV therapy should only be used on an HDU, ideally with a monitor, and MUST be given slowly as directed Oral salbutamol should ONLY be used if it is the only option available and for a maximum duration of 1 week. Use inhaled steroid for persistent asthma*	**IV in hospital only over 5 mins** – < 2 yrs 5 microgram/kg, ≥ 2 yrs up to 15 microgram/kg *max dose 250 micrograms (0.25mg)* **Nebulised:** 2.5mg/dose as required *(see Page 34)* **Inhaled (***Not for use as long-term therapy***):** (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 31 for emergency use).* **Oral (*no longer recommended unless no inhaled therapy*):** **Age 2-11 m**: 1mg/dose 6-8hrly, **Age 1 - 4 yrs**: 2mg/dose 6-8hrly *(1 week only – not suitable for maintenance therapy)*
TB Treatment	*See page 35*
Valproate (sodium)	**Age 1m –12yrs:** initially 5 – 7.5 mg/kg twice daily (max. 600 mg in one day); usual maintenance dose 12.5–15 mg/kg twice daily - *must monitor clinical chemistry and haematological parameters if dose exceeds 40 mg/kg daily*
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** < 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 – 12 wks or one high dose. ± Calcium for first week of treatment.*	**Age** / **Dosage** < 6m / 3,000 u = 75 micrograms > 6m / 6,000 u = 150 micrograms > 6m stat im regimen / 300,000 u = 7.5 mg Stat
Vitamin D – ***Maintenance*** *After treatment course*	**Age** / **Dosage** < 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	**Age ≤ 6m**: 10mg od, 14 days **Age > 6 m**: 20mg,

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 DZ is given at a depth of 4 - 5cm)				Glucose, 5mls/kg of 10% glucose over 5 - 10 minutes For neonates - 2 mls/kg	
	iv	iv	pr	pr	iv	
	Dose, 0.3mg/kg	mls of 10mg/2ml solution	Dose, 0.5mg/kg	mls of 10mg/2ml solution	Total Volume of 10% Glucose	To make 10% glucose
3.0	1.0	0.20	1.5	0.3	15	**50% Glucose and 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

(for neonatal doses see page 47)

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 / ng**	**iv / oral / ng**
2.0	30	10	-	5	-	*Tablets may be crushed and put down 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 47)

Weight *(kg)*	Penicillin* (50,000 iu/kg)	Ampicillin or Flucloxacillin (50mg/kg)	Chloramphenicol (25mg/kg)	Gentamicin (7.5mg/kg)	Ceftriaxone iv/im Max 50mg/kg 24hrly for neonates** *Meningitis / Very Severe Sepsis, 50mg/kg BD*	Metronidazole (7.5mg/kg)
	iv / im	**iv / im**	**iv / im**	**iv / im** (over 3-5 mins)		**iv**
	6 hrly	**8 hrly**	**6hrly - meningitis**	**24 hrly**	**50mg/kg**	**Age < 1m:** 12 hrly **Age ≥ 1m:** 8 hrly
3.0	150,000	150	75	20	150	20
4.0	200,000	200	100	30	200	30
5.0	250,000	250	125	35	250	35
6.0	300,000	300	150	45	300	45
7.0	350,000	350	175	50	350	50
8.0	400,000	400	200	60	400	60
9.0	450,000	450	225	65	450	65
10.0	500,000	500	250	75	500	75
11.0	550,000	550	275	80	550	80
12.0	600,000	600	300	90	600	90
13.0	650,000	650	325	95	650	95
14.0	700,000	700	350	105	700	105
15.0	750,000	750	375	110	750	110
16.0	800,000	800	400	120	800	120
17.0	850,000	850	425	125	850	125
18.0	900,000	900	450	135	900	135
19.0	950,000	950	475	140	950	140
20.0	1,000,000	1000	500	150	1000	150

** Double Penicillin doses if treating Meningitis and age > 1 month*

*** Not recommended if jaundiced or age < 7 days*

Oral antibiotic doses

(for neonatal doses see page 47)

Weight (kg)	Amoxicillin 12 hrly, **or** Chloramphenicol 6 hrly 25mg/kg/dose		High dose Amoxicillin (*for pneumonia*) 40-45mg/kg/dose			Cloxacillin / Flucloxacillin 15mg/kg/dose		Ciprofloxacin 15mg/kg/dose (for 3 days)	Metronidazole 7.5mg/kg/dose
			mls susp		caps	mls susp 125mg/5ml	250mg caps or tabs	250mg tabs	200mg tabs
	mls susp 125mg/5ml	250mg caps	12 hrly			8 hrly		12 hrly	8 hrly
3.0	4		125mg / 5mls	5		2.5	1/4		
4.0	4			7.5		2.5	1/4	1/4	
5.0	6			7.5	1 x 250mg cap	5	1/4	1/4	1/4
6.0	6			10		5	1/2	1/4	1/4
7.0	8		250mg / 5mls	5		5	1/2	1/2	1/2
8.0	8			5		5	1/2	1/2	1/2
9.0	8			7.5	2 x 250mg cap **or** 1 x 500mg cap	5	1/2	1/2	1/2
10.0	12	1		7.5		5	1	1/2	1/2
11.0	12	1		10		10	1	1	1/2
12.0	12	1		10		10	1	1	1/2
13.0	12	1		10		10	1	1	1/2
14.0	12	1		12.5		10	1	1	1
15.0	15	1		12.5		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

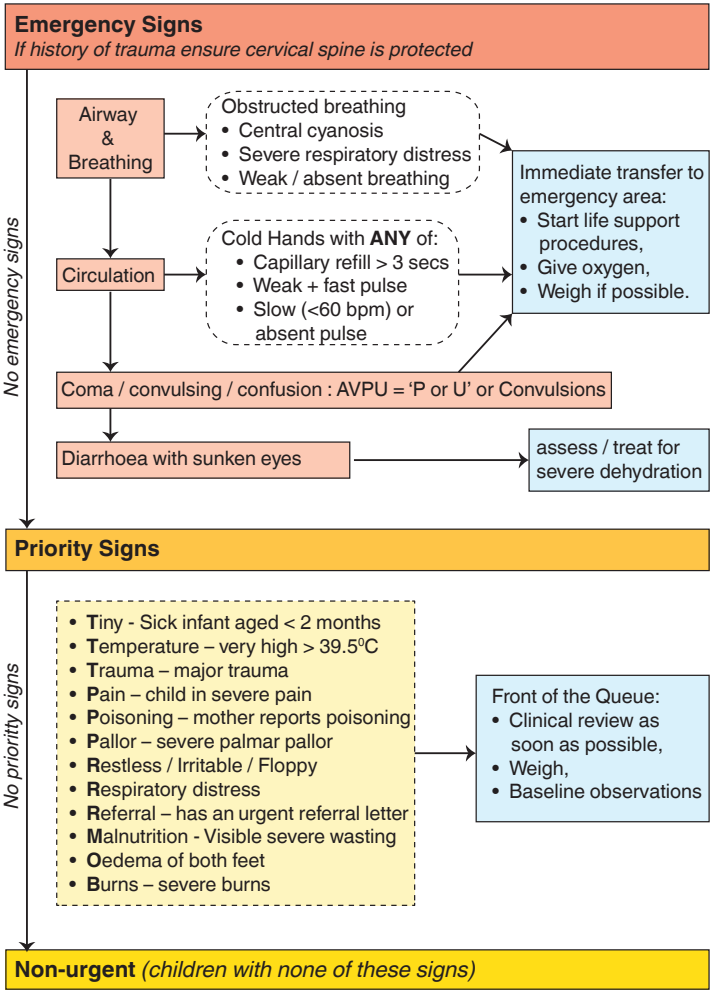
(Normal Renal function)

Note:

- Children should receive 1-2 mmol / kg / day of potassium
- **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 Ringers Lactate to make Ringers/5% dextrose for maintenance fluid *(use HSD plus 5% dextrose if no Ringers)*.
- Drip rates are in drops per minute

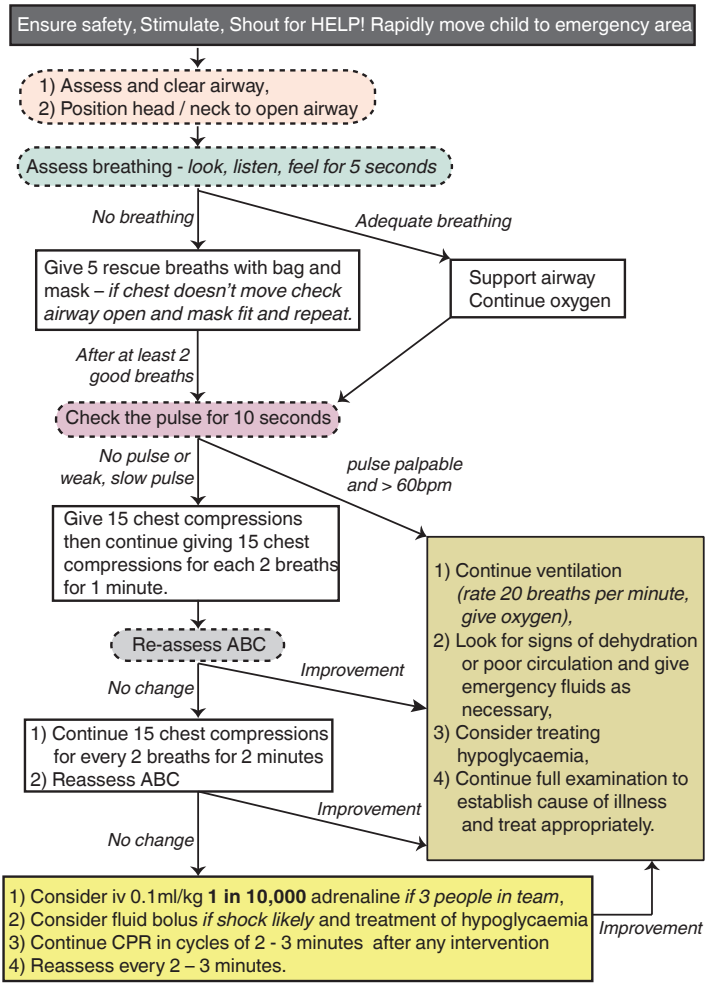
Weight (kg)	**Volume in 24hrs**	**Rate** (mls/hr)	**Drip rate adult iv set** *(20 drops = 1ml)*	**Drip rate paediatric burette** *(60 drops = 1ml)*	**3hrly bolus feed volume**
3	300	13	4	13	40
4	400	17	6	17	50
5	500	21	7	21	60
6	600	25	8	25	75
7	700	29	10	29	90
8	800	33	11	33	100
9	900	38	13	38	110
10	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



Infant/Child Basic Life Support

(cardiorespiratory collapse)



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?* • emperature gradient? • Capillary refill? • Peripheral pulse – *weak or not palpable* *(Note initial response to stimulation / alertness)* • Check for severe pallor ***If signs of poor circulation*** • Check for severe dehydration • Check for 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 Ringers 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 Ringers Lactate **over 2 hours** • ***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 needle
- ✓ 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

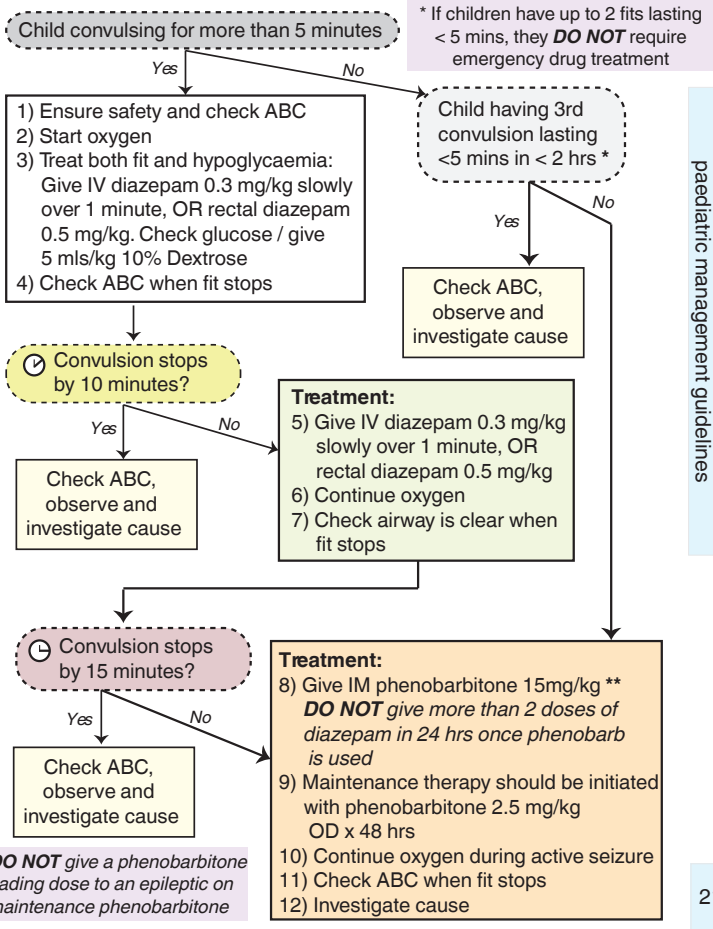
Oxygen Administration Device	Flow rate and inspired O_2 concentration
Nasal prong or short nasal catheter*	**Neonate** – 0.5 L/min **Infant / Child** – 1 – 2 L/min **O_2 concentration** – approx 30-35%
Naso-pharyngeal *(long)* catheter	**Neonate** – *not recommended* **Infant / Child** – 1 – 2 L/min **O_2 concentration** – approx 45%
Plain, good fitting oxygen face mask	**Neonate / Infant / Child** – 5 - 6 L/min *(check instructions for mask)* **O_2 concentration** – approx 40 - 60%
Oxygen face mask with reservoir bag	**Neonate / Infant / Child** – 10 - 15 L/min **O_2 concentration** – approx 80 - 90%

** Nasal prong / catheter flow rates can be increased to 2L/min for newborns and 4L/min for infants children if not responding to lower rates – 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.



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

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

Diarrhoea / Gastroenteritis

age > 1 month (excluding severe malnutrition)

Diarrhoea > 14 days may be complicated by intolerance of ORS – worsening diarrhoea – if seen change to iv regimens. **All cases to receive Zinc.**

History of diarrhoea / vomiting, age > 2 months

Antibiotics are NOT indicated unless there is **dysentery or persistent diarrhoea** and proven amoebiasis or giardiasis.

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

- Ringers 20 mls/kg over 15 mins, a second bolus may be given if required before proceeding to step 2 of Plan C (*see below*).
- Treat for hypoglycaemia
- Start ORS 5 mls/kg/hr once able to drink

No

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

- sunken eyes
- return of skin pinch ≥ 2 secs

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

OR

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

ngt rehydration - 100 mls/kg ORS over 6 hrs

Re-assess at least hourly, after 3 - 6 hrs, 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 and treat according to classification

No

NO Dehydration
Diarrhoea / GE 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

Dehydration management

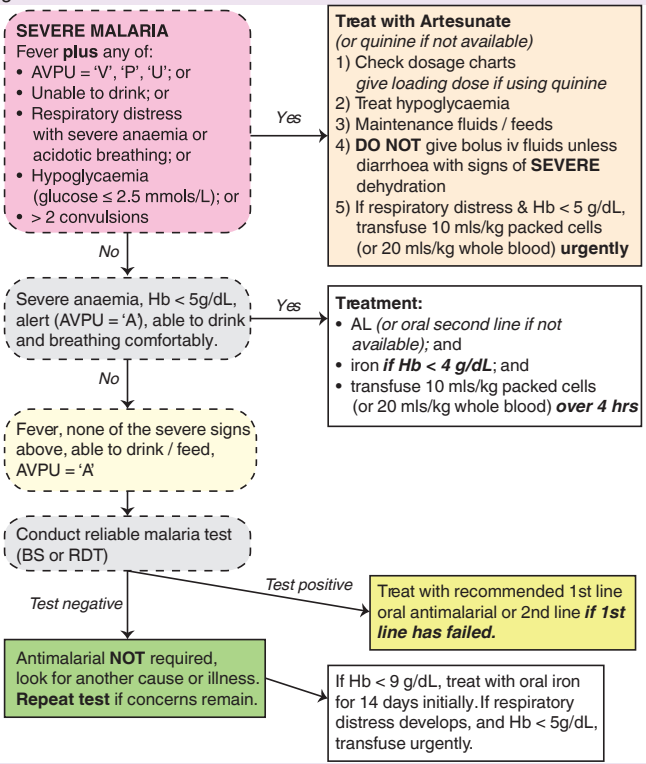
(child WITHOUT severe malnutrition/severe anaemia*)

Weight (kg)	Shock, 20mls/kg Ringer's / Hartmann'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 'adult' iv giving sets where 20drops=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*

Malaria

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=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 N/saline for infusion with 0.5 – 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 Bisuphate. 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 (kg)	Artesunate, 2.4mg/kg *At 0, 12, and 24h then daily for max 7 days*			Quinine, loading 20mg/kg then 10mg/kg		Quinine, tabs, 10mg/kg 200mg QN 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	0.75	7.5	0.35	60	30	1/4
4.0	1	10	0.5	80	40	1/4
5.0	1.2	12	0.6	100	50	1/4
6.0	1.5	14	0.7	120	60	1/2
7.0	1.7	17	0.8	140	70	1/2
8.0	1.9	19	1.0	160	80	1/2
9.0	2.1	22	1.1	180	90	1/2
10.0	2.4	24	1.2	200	100	3/4
11.0	2.6	26	1.3	220	110	3/4
12.0	2.9	29	1.5	240	120	3/4
13.0	3.1	31	1.6	260	130	3/4
14.0	3.4	34	1.7	280	140	3/4
15.0	3.6	36	1.8	300	150	1
16.0	3.8	38	1.9	320	160	1
17.0	4.1	41	2.0	340	170	1
18.0	4.3	43	2.2	360	180	1
19.0	4.6	46	2.3	380	190	1 1/4
20.0	4.8	48	2.4	400	200	1 1/4

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

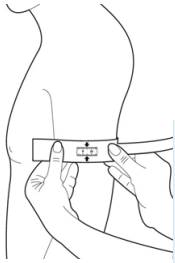
Weight	Age	Dose
< 5 kg	-	1/2 tablet
5 - 15 kg	3 - 35 mo	1 tablet
15 - 24 kg	3 - 7 yrs	2 tablets
25 - 34 kg	9 - 11 yrs	3 tablets

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 plotted over time, eg. *in MCH booklet*

In the diagnosis of acute malnutrition we use W/H ***expressed as Z scores***. Z-scores can be obtained from simple tables (*pp 48 to 51*)

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

Kwashiorkor = severe malnutrition *(at any age)*

Classifying malnutrition

(for WHZ values see pp 48 to 51)

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	

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 glucose and treat if < 3 mmol/l (*5 mls/kg 10% 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 – use Diarrhoea / Dehydration flowchart to classify then USE fluid plans for severe malnutrition.
- Transfuse *if Hb < 4 g/dL*, 10mls/kg whole blood in 3hrs + frusemide 1mg/kg (*for shock see 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
- Mebendazole 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 RTUF or F75/F100*
- Iron ONLY when child is gaining weight & *if no RTUF*.

Step 7

Prescribe feeding needed (*see chart*) and place ngt.

Steps 8, 9 & 10: Ensure appetite and weight are monitored and start catch-up feeding **with RTUF** (*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.

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 Ringers with 5% dextrose - add 50 mls 50% dextrose to 450 mls Ringers (or 5% Dextrose/HSD if no Ringers)
If severe anaemia start urgent blood transfusion not Ringers.

If not shocked 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:** Introduce first feed with F75 and alternate Resomal / 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 / ngt feeds with F75 (*next page*)

Weight (kg)	Fluids for shock complicating malnutrition		Oral / ngt *first 12 hours*	Emergency maintenance
	20mls/kg over 2 hrs		7.5mls/kg/hr	4mls/kg/hr
	Ringers in 5% Dextrose		Resomal*/ F75 (**10mls/kg first 2 hrs*)	Ringers in 5% Dextrose
	iv		Oral / ngt	iv
	Shock (*over 2 hrs*)	**Drops/min** *if 20 drops/ml giving set*	**7.5mls/kg/hr** for up to 10 hours	mls/ hour until transfusion
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

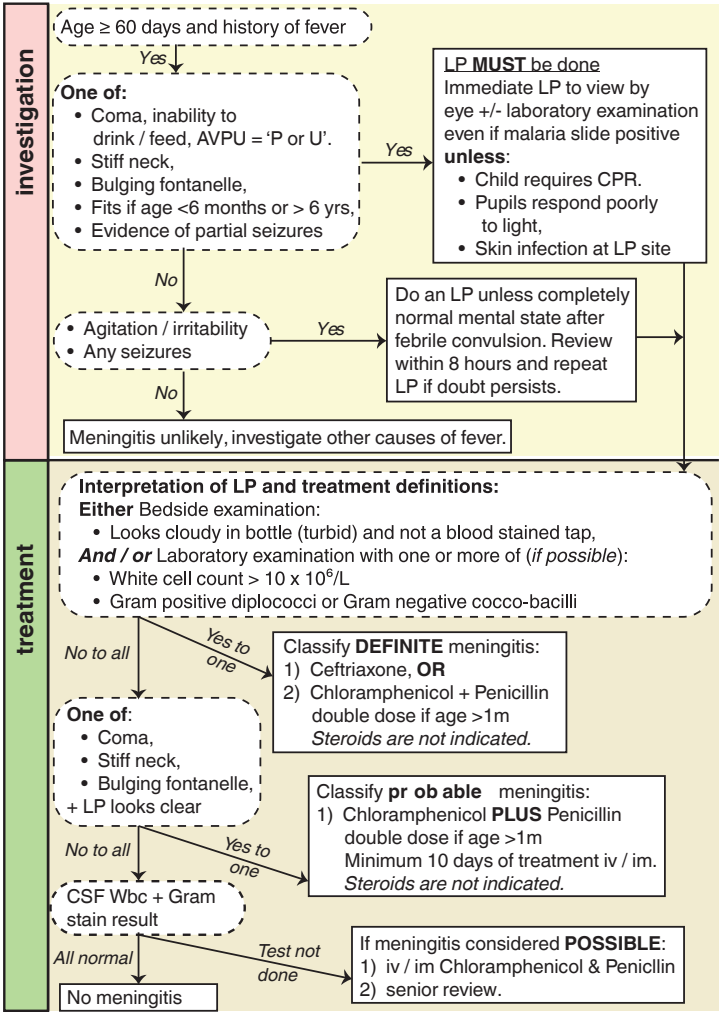
(age 6 - 59 months)

- 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 500kcal in 92g packets for **rehabilitation**. All vitamins, minerals and iron are in RUTF. Allow the child to nibble RUTF very frequently and drink liberally. RUTF can be mixed into uji or other foods slowly introduced. If RUTF unavailable then increase F100 to 150mls/kg in rehabilitation and increase daily as tolerated.

Weight (kg)	F75 – acute feeding				F100 if no RUTF		RUTF Transition Phase	RUTF Rehabil'n Phase
	No or moderate oedema *(130mls/kg/day)*		Severe oedema, even face*(100mls/kg/day)*		F100 @ *150mls/kg/day* Rehabilitation Phase			
	Total Feeds / 24 hrs	3 hourly feed volume	Total Feeds / 24 hrs	3 hourly feed volume	Total Feeds / 24 hrs	3 hourly feed volume	Packets per 24hrs	Packets per 24hrs
4.0	520	65	400	50	600	75	1.5	2.0
4.5	585	75	450	60	675	85		
5.0	650	80	500	65	750	95	2.1	2.5
5.5	715	90	550	70	825	105		
6.0	780	100	600	75	900	115		
6.5	845	105	650	85	975	125		
7.0	910	115	700	90	1050	135	2.5	3.0
7.5	975	120	750	95	1125	140		
8.0	1040	130	800	100	1200	150		
8.5	1105	140	850	110	1275	160	2.8	3.5
9.0	1170	145	900	115	1350	170		
9.5	1235	155	950	120	1425	180	3.1	4.0
10.0	1300	160	1000	125	1500	190		
10.5	1365	170	1050	135	1575	200	3.6	4.0
11.0	1430	180	1100	140	1650	210		
11.5	1495	185	1150	145	1725	215		
12.0	1560	195	1200	150	1800	225	4.0	5.0

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

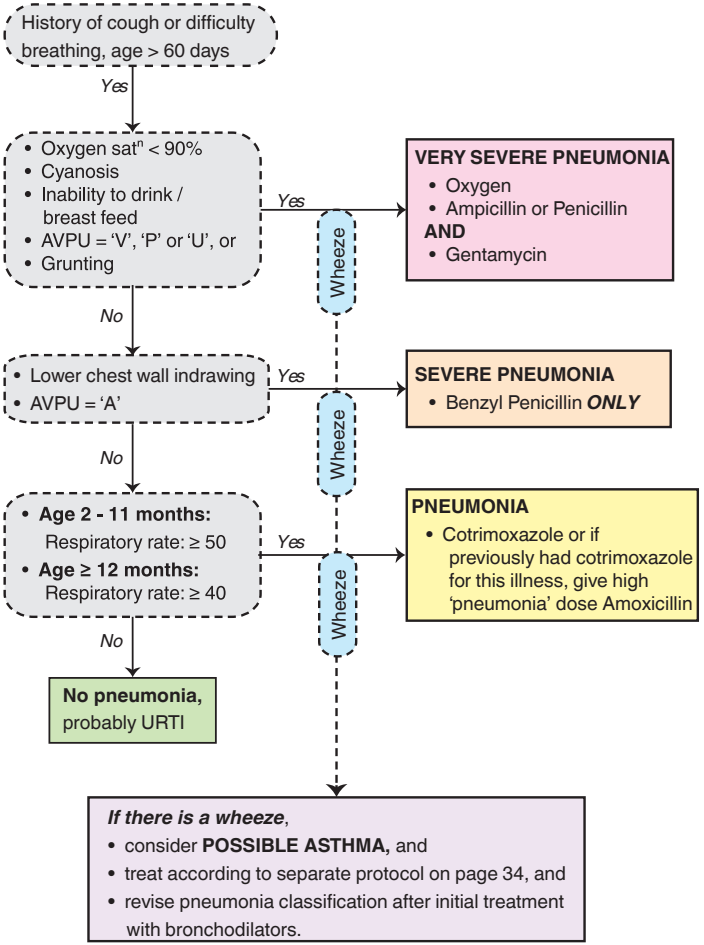
Meningitis


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 seizures
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, OR
2) Chloramphenicol + Penicillin double dose if age >1m
Steroids are not indicated.
One of:
• Coma,
• Stiff neck,
• Bulging fontanelle,
+ LP looks clear
No to all
Yes to one
Classify pr ob able meningitis:
1) Chloramphenicol PLUS Penicillin double dose if age >1m
Minimum 10 days of treatment iv / im.
Steroids are not indicated.
CSF Wbc + Gram stain result
All normal
Test not done
No meningitis
If meningitis considered POSSIBLE:
1) iv / im Chloramphenicol & Penicllin
2) senior review.

Pneumonia

for children aged 2 - 59 months

For HIV exposed / infected children see page 36

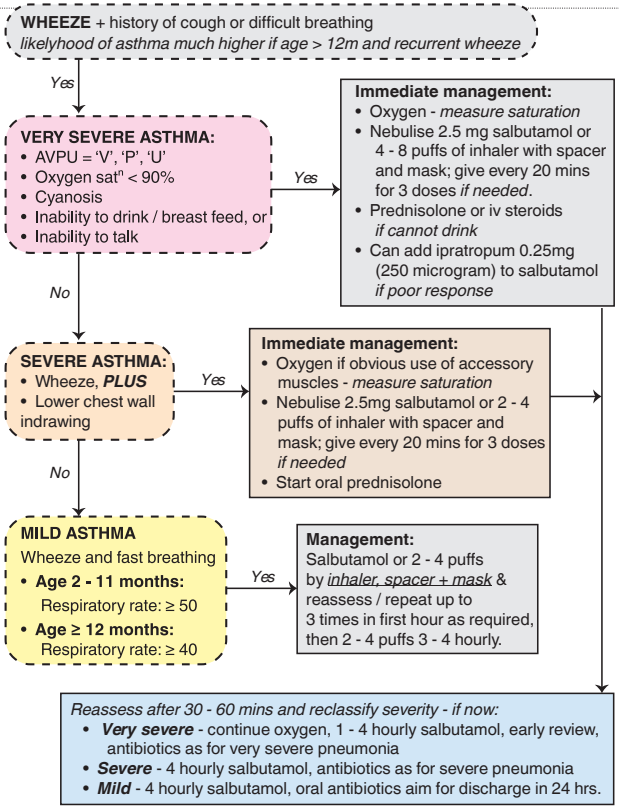


Pneumonia treatment failure definitions

HIV infection or TB may underlie treatment failure – testing helps the child.
See HIV page for PCP treatment (page 36); see TB page for PTB (page 35).

Treatment failure definition	Action required
Any time.	
Progression of severe pneumonia to very severe peumonia *(development of cyanosis or inability to drink in a child with pneumonia without these signs on admission)*	Change treatment from Penicillin alone and add gentamicin.
Obvious cavitation on CXR	Treat with Cloxacillin and gentamicin iv for Staph. Aureus or Gram negative pneumonia.
48 hours	
Very severe pneumonia child getting worse, re-assess thoroughly, get chest X ray if not already done *(looking for empyema / effusion, cavitation etc).*	Switch to Ceftriaxone unless suspect Staphylococcal pneumonia when use pen, flucloxacillin and gent. *Suspect PCP especially if <12m, an HIV test **must** be done - treat for Pneumocystis if HIV positive*
Severe pneumonia *without* improvement in at least **one** of: ✓ *Respiratory rate,* ✓ *Severity of indrawing,* ✓ *Fever,* ✓ *Eating / drinking.*	Change treatment from Penicillin alone and **add** 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 indrawing persistent* ✓ *Worsening CXR*	• If only on penicillin change to Penicillin / Gentamicin • If on Pen & Gent 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



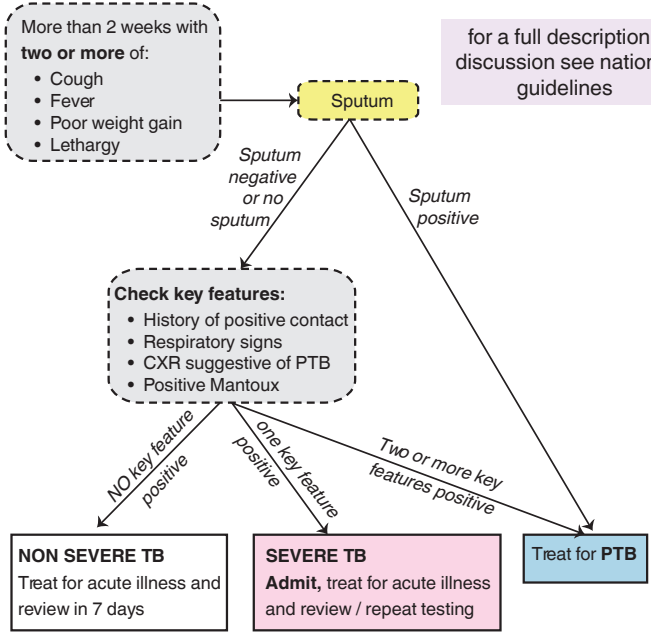
Reassess after the first hour of emergency asthma management

If mild symptoms or asymptomatic – send home on salbutamol MDI 2 puffs every 6 hours until asthma symptoms cease and follow up in clinic.

If severe/very severe asthma symptoms – ADMIT, and give:

1. Oxygen to maintain SpO_2 above 94% or until drinking / speaking and all danger signs resolved
2. Salbutamol (MDI 4 puffs or nebulise hourly) until moderate – severe symptoms subside, then give 2 puffs or/ nebuliser 4 – 6 hourly.
3. Antibiotics dependent on severity (or senior review)
4. Continue steroids daily for 3 to 5 days, stopping when symptoms subside.

Tuberculosis



Regimens and dosing

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

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

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 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 their child 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 6m, just add complementary feeds and continue nevirapine until 1 week after breast feeding stops
3) Refer child and carers to an HIV support clinic – HAART should start in all HIV infected children age < 18 months as soon as the diagnosis is confirmed.
4) All HIV exposed / infected infants should start CTX prophylaxis from age 6 wks

HIV

Managing the HIV exposed / infected infant

Please check for updates – ARV doses change fast!

PMTCT Nevirapine Prophylaxis:

- If formula fed from birth give nevirapine for first 6 weeks only
- If breastfeeding – continue and stop 1 week after breast feeding stopped

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*) ***(If formula feeding only from birth give for 6 wks)***
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 / very 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)* - steroids are not recommended as additional treatment for Pneumocystis pneumonia

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	***24hrly*** for prophylaxis, ***8 hrly*** for 3wks 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 (≥14days) 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.

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

PREPARE BEFORE DELIVERY - EQUIPMENT, WARMTH, GETTING HELP

If the baby has not taken a breath at all, think is there MECONIUM?

No

Breathing should be started within 60 secs

- Use warm cloth to dry and stimulate baby
- Observe activity, colour and breathing
- Wrap in new, dry, warm cloth with chest exposed

Yes

Before first breath and **Before** drying / stimulating

- Suck / clean oro pharynx under direct vision

Do not do deep, blind suction

Baby now active & taking breaths?

Yes

- Skin to skin contact with mother to keep warm and observe
- Initiate breast feeding

No

A - airway

- **Check airway is clear**
  If anything visible, use suction to clear
- **Put head in neutral position**

B - breathing

Is baby breathing?

Yes

- Keep warm
- Count rate of breathing and heart rate
- Give oxygen if continued respiratory distress

ABC ok

- Continue with about 30 breaths / min,
- Reassess ABC every 1 - 2 mins,
- Stop using bag when breathing and heart rate OK

Poor or NO breathing / gasping

CALL FOR HELP!
Start ventilation Ensure the chest rises in first breaths, continue at about 30 breaths / min
Check heart rate at 1 min

C - circulation

Is heart rate > 60 bpm?

Yes

No

- Give 1 EFFECTIVE breath for every 3 chest compressions for 1 min.
- Reassess ABC every 1 - 2 mins
- Stop compressions when HR > 60 bpm and support breathing until OK

Neonatal Sepsis / Jaundice

see page 47 for NN 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 gentamycin and penicillin *(see chart on page 47)*
3) Give oxygen if cyanosed / respiratory rate > 60 bpm
4) Give Vitamin K *if born at home or not given on maternity*
5) Keep warm
6) Maintain feeding by mouth or ngt, use iv fluids only if respiratory distress or severe abdominal distension *(see charts on page 44 - 46)*

Also check

SIGNS OF SERIOUS ILLNESS

- Jaundice (*see page 37 & 38*)
- Capillary refill
- Severe pallor
- PROM > 18 hrs *if aged < 7 d*
- Localized severe infection - joints, abdominal distension
- Weight loss

DECIDE - does the baby need fluids, feeds (pages 44 - 46) or blood?

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

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 if aged <24hrs needs further investigation and treatment
- ✓ **Refer early if jaundice in those aged <24hrs 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 bilrubin 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 breastfeeding.*** 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 phototerapy** - 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**

Duration of treatment for neonatal / young infant sepsis

Problem	Days of treatment
Signs of young Infant 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.

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 <14d give Vitamin K unless already given
- ***1mg Vitamin K im if weight > 1.5kg, 0.5mg im if weight <1.5kg***

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
- 2.5mls of ferrous fumarate suspension daily ***starting at 4-6 weeks of age*** for 12 wks.

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 IVF **from Day 2** use 2 parts 10% dextrose to 1 part HS Darrow's (eg. 200mls 10% D + 100mls HSD) if not able to calculate or give added Na+ (2-3mmol/kg/day) and K+ (1-2mmol/kg/day) to glucose solution.
- ✓ ***Please ensure sterility of iv fluids when mixing / adding***
- ✓ Always use EBM for NGT feeds 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.

- ✓ **Day 1 - Sick baby** start with 24hrs iv 10%D – **If you think iv feeding is unsafe** then start immediate ngt feeding with colostrum
- ✓ **From Day 2** unless baby very unwell start NGT feeds - Begin with 5mls 3hrly as <1.5kg. Increase feed by the same amount **every day** and reduce iv fluids to keep within the total daily volume until IVF stopped – see **Table**
- ✓ For IVF **from Day 2** use 2 parts 10% dextrose to 1 part HS Darrow's (eg. 200mls 10% D + 100mls HSD) if not able to calculate or give added Na+ (2-3mmol/kg/day) and K+ (1-2mmol/kg/day) to glucose solution.
- ✓ ***Please ensure sterility of iv fluids when mixing / adding***
- ✓ Always use EBM for NGT feeds 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*

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

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

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	18	0	20	0	18	2	20	3	20
Day 6	0	21	0	22	0	21	1	25	3	25
Day 7+	0	21	0	22	0	24	0	30	0	33

Neonatal antibiotic doses

Intravenous / intramuscular antibiotics aged < 7 days

Weight (kg)	Penicillin (50,000iu/kg) iv / im 12 hrly	Ampicillin / Cloxacillin (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 / Cloxacillin 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 is a safer cephalosporin in the first 7 days of life

I. Weight for length (height) charts

for children aged 0 - 23 months

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'. For more precise WHZ scores please use Weight for Height Charts.	1.9	2.1	2.3	For children who have a weight for height that is not ≤ -1 then classify as 'normal'. For more precise WHZ scores please use Weight for Height Charts.
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	

II. Weight for length (height) charts

for children aged 0 - 23 months

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'. For more precise WHZ scores please use Weight for Height Charts.	7.5	8.2	8.9	For children who have a weight for height that is not ≤ -1 then classify as 'normal'. For more precise WHZ scores please use Weight for Height Charts.
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	

III. Weight for height charts

for children aged 2 - 5 years

Height (cm)	Weight (kg)							
	Boys				Girls			
	– 3SD	–2SD	–1SD		– 3SD	–2SD	–1SD	
66	6.1	6.5	7.1	For children who have a weight for height that is not ≤ -1 then classify as '**normal**'. For more precise WHZ scores please use Weight for Height Charts.	5.8	6.3	6.8	For children who have a weight for height that is not ≤ -1 then classify as '**normal**'. For more precise WHZ scores please use Weight for Height Charts.
67	6.2	6.7	7.3		5.9	6.4	7	
68	6.4	6.9	7.5		6.1	6.6	7.2	
69	6.6	7.1	7.7		6.3	6.8	7.4	
70	6.8	7.3	7.9		6.4	7	7.6	
71	6.9	7.5	8.1		6.6	7.1	7.8	
72	7.1	7.7	8.3		6.7	7.3	8	
73	7.3	7.9	8.5		6.9	7.5	8.1	
74	7.4	8	8.7		7	7.6	8.3	
75	7.6	8.2	8.9		7.2	7.8	8.5	
76	7.7	8.4	9.1		7.3	8	8.7	
77	7.9	8.5	9.2		7.5	8.1	8.8	
78	8	8.7	9.4		7.6	8.3	9	
79	8.2	8.8	9.6		7.8	8.4	9.2	
80	8.3	9	9.7		7.9	8.6	9.4	
81	8.5	9.2	9.9		8.1	8.8	9.6	
82	8.7	9.3	10.1		8.3	9	9.8	
83	8.8	9.5	10.3		8.5	9.2	10	
84	9	9.7	10.5		8.6	9.4	10.2	
85	9.2	10	10.8		8.8	9.6	10.4	
86	9.4	10.2	11		9	9.8	10.7	
87	9.6	10.4	11.2		9.2	10	10.9	
88	9.8	10.6	11.5		9.4	10.2	11.1	
89	10	10.8	11.7		9.6	10.4	11.4	
90	10.2	11	11.9		9.8	10.6	11.6	
91	10.4	11.2	12.1		10	10.9	11.8	
92	10.6	11.4	12.3		10.2	11.1	12	
93	10.8	11.6	12.6		10.4	11.3	12.3	
94	11	11.8	12.8		10.6	11.5	12.5	
95	11.1	12	13		10.8	11.7	12.7	
96	11.3	12.2	13.2		10.9	11.9	12.9	
97	11.5	12.4	13.4		11.1	12.1	13.2	
98	11.7	12.6	13.7		11.3	12.3	13.4	
99	11.9	12.9	13.9		11.5	12.5	13.7	

IV. Weight for height charts

for children aged 2 - 5 years

Height (cm)	Weight (kg)							
	Boys				Girls			
	– 3SD	–2SD	–1SD		– 3SD	–2SD	–1SD	
100	12.1	13.1	14.2	For children who have a weight for height that is not ≤ -1 then classify as '**normal**'.	11.7	12.8	13.9	For children who have a weight for height that is not ≤ -1 then classify as '**normal**'.
101	12.3	13.3	14.4		12	13	14.2	
102	12.5	13.6	14.7		12.2	13.3	14.5	
103	12.8	13.8	14.9		12.4	13.5	14.7	
104	13	14	15.2		12.6	13.8	15	
105	13.2	14.3	15.5		12.9	14	15.3	
106	13.4	14.5	15.8		13.1	14.3	15.6	
107	13.7	14.8	16.1		13.4	14.6	15.9	
108	13.9	15.1	16.4		13.7	14.9	16.3	
109	14.1	15.3	16.7		13.9	15.2	16.6	
110	14.4	15.6	17		14.2	15.5	17	
111	14.6	15.9	17.3		14.5	15.8	17.3	
112	14.9	16.2	17.6		14.8	16.2	17.7	
113	15.2	16.5	18		15.1	16.5	18	
114	15.4	16.8	18.3		15.4	16.8	18.4	
115	15.7	17.1	18.6		15.7	17.2	18.8	
116	16	17.4	19		16	17.5	19.2	
117	16.2	17.7	19.3		16.3	17.8	19.6	
118	16.5	18	19.7		16.6	18.2	19.9	
119	16.8	18.3	20		16.9	18.5	20.3	
120	17.1	18.6	20.4		17.3	18.9	20.7	

Notes

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 medial 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)
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

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.

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