



REPUBLIC OF UGANDA

MINISTRY OF HEALTH

Basic Paediatric Protocols

December 2014

Table of Contents

Topic	Page Number
<i>Abbreviations/ Principles</i>	3 – 5
Clinical Audit and Hand hygiene	6 – 8
Essential Drugs	
Basic Formulary	9
Emergency drugs – dose charts	
• Diazepam and Glucose	11
• Phenobarbitone and Phenytoin	12
Intravenous antibiotics (age > 7 days)	13
Oral antibiotics	14
Maintenance Fluid / Feed Volumes – not malnourished	15
Triage	16
Paediatric Management guidelines	
Infant / Child resuscitation	17
Emergency care – Signs of Life	18
Intra-osseous lines	19
Convulsions	20
Diarrhoea / dehydration	21
• Fluids for severe and some dehydration	22
Malaria	23
• Malaria drug doses	24
Malnutrition	26- 27
• Emergency fluids & feed recipes	28
• Feeding	29- 30
Meningitis	31
Respiratory disorders	
• Pneumonia	32
• Pneumonia treatment failure	33
• Asthma	34
HIV – PITC and influence on acute treatment	35- 36
Newborn Care Management Guidelines	
• Newborn resuscitation	37- 38
• Neonatal Sepsis / Prematurity / VLBW	39
• Neonatal Jaundice	40- 41
• Newborn care notes – treatment, and early nutrition	42
• Newborn feeds / fluids (ages 1 – 7 days)	43- 44
• Newborn drugs (ages 1 – 6 days)	45
Emergency estimation of child's weight	46
Appendix 1 – Prescribing oxygen	47
Appendix 2 – Preparation of therapeutic feeds	48- 50
Weight for Length (height) charts	51- 54

Abbreviations

CTX = Cotrimoxazole prophylaxis treatment

HIV= Human immunodeficiency virus

IMAM= Intergrated management of malnutrition

OPD= Outpatient department

PITC= Provider initiated testing and counselling

RUTF = Ready to Use Therapeutic Foods

SDTM = Specially Diluted Therapeutic Milk

WHO= World Health Organization

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 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 may mean regular review in the first 6 – 12 hours of admission – such review needs to be planned between medical and nursing staff.
- 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:

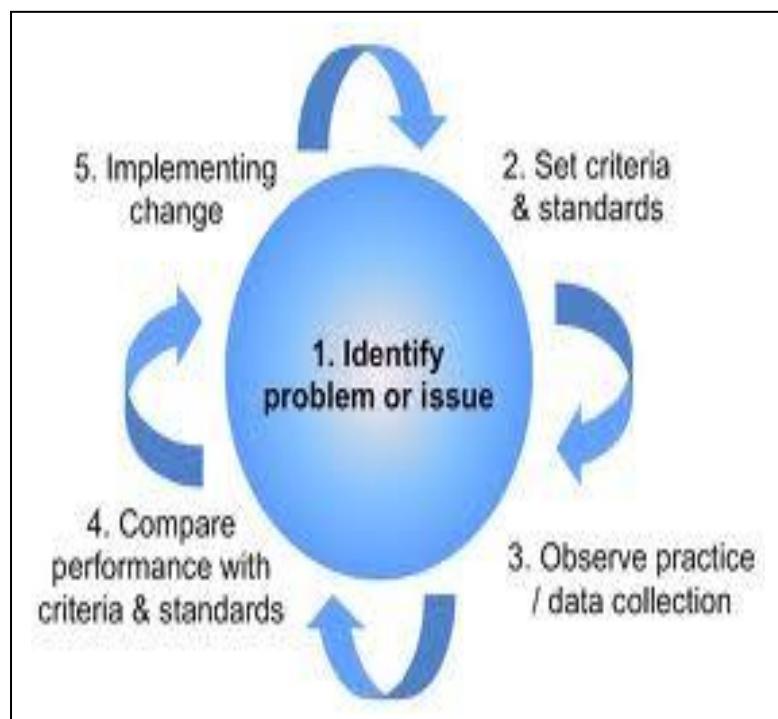
- ✓ All children admitted to hospital and all newborns requiring medical treatment – even if born in hospital – should have their own inpatient number and set of medical records. Admission should ideally be recorded using a standardized paediatric or newborn admission record
- ✓ Medical records are a 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.
- ✓ All admissions aged >6m should receive Vitamin A unless they have received a dose within the last 1 month. (Malnourished children with eye signs receive repeated doses).

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) used to establish nutritional status
- ✓ Respiratory rates must be counted for 1 minute.
- ✓ Conscious level should be assessed on all children admitted using the AVPU scale where:
 - A = Alert and responsive
 - V = responds to Voice or Verbal instructions, eg turns head to mother's call. ***These children may still be lethargic or unable to drink / breastfeed (prostrate).***
 - P = responds to Pain appropriately. In a child **older than 9 months** a painful stimulus such as rubbing your knuckles on the child's sternum should result in the child pushing the hand causing the pain away. In a **child 9 months and younger** they do not reliably locate a painful stimulus, in these children if they bend the arms towards the pain and make a vigorous, appropriate cry they respond to pain = 'P'. ***Children in this category must be lethargic or unable to sit up or drink / breastfeed (prostrate).***
 - U = Unconscious, cannot push a hand causing pain away or fail to make a response at all.
- ✓ 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.

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 textbooks 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 for reporting.

Hand Hygiene

- Good hand hygiene saves lives
- Gloves can easily become contaminated too – they 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 then hands should be washed with simple soaps 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 touching potentially contaminated surfaces (eg. cot sides, dirty mattresses, stethoscopes)*
- Patients and caregivers should wash hands carefully after visits to the bathrooms or contact with body fluids

Use of Alcohol Hand rub / gel



Essential Drugs	Doses		
Adrenaline 1 in 10,000	Dilute 1; 9 (1 in 1000 adrenaline in water for injection). Give 0.1ml/kg in resuscitation.		
Albendazole	Age < 2yrs , 200mg stat, Age ≥ 2yrs , 400mg stat		
Aminophylline- iv ONLY used in hospital inpatients!	Newborn Loading dose 6mg/kg iv over 1 hour or rectal, Maintenance (or oral) : <u>Age 0-7 days</u> - 2.5mg/kg 12hrly, <u>Age 7-28 days</u> 4mg/kg 12hrly. Asthma: 6mg/kg iv first dose over 30 mins		
Amoxicillin	Neonate Page 45, other Page 13		
Artemether- Lumefantrine	Page 25		
Artemisinin-Piperaquine/	Page 25		
Artesunate - iv			
Beclomethasone	Age < 2yrs 50-100 micrograms 12hrly, ≥ 2yrs 100-200 micrograms 12hrly		
Benzyl Penicillin (X-pen)	Neonate Page 45, other Page 13		
Ceftriaxone	Neonate Page 45, other Page 13		
Chloramphenicol -	Page 13 and 14		
Ciprofloxacin - oral	Dysentery dosing: Page 14		
Clotrimazole 1%	Apply paint / cream daily		
Dexamethasone	For severe croup 0.6mg/kg stat		
Flucloxacillin	Neonate Page 45, other Page 13		
Co-trimoxazole- pneumonia dosing (4mg/kg Trimethoprim & 20mg/kg sulphamethoxazole)	Weight	240mg/5ml syrup	480mg tabs
		12hrly	12hrly
	2 - 3kg	2.5mls	1/4
	4 - 10kg	5mls	1/2
	11 - 15 kg	7.5ls	1/2
	16 - 20 kg	10mls	1
Diazepam - iv	0.3mg/kg (=300 mcg/kg) & See separate chart		
Diazepam - rectal	0.5mg/kg (=500 mcg/kg) & See separate chart		
Digoxin	15 mics/kg loading dose then 5 mics/kg 12 hrly		
Furosemide	0.5 to 1mg/kg up to 6 hrly		
Gentamicin	Neonate Page 45, other Page 13		
Ibuprofen	5 - 10 mg/kg 8 hourly		
Iron tabs / syrup	Weight	200mg tabs	Syrup 140mg/5mls
200mg Ferrous sulphate tabs		Twice daily	Twice daily
140mg /5mls Ferrous fumarate syrup	3-6 kg	-	2.5 mls
	7-9 kg	1/4	5 mls
	10-14 kg	1/2	10 mls
	15-20 kg	1/2	15 mls

Ketoconazole	3mg/kg dialy
Mebendazole (age > 1yr)	100mg bd for 3 days or 500mg stat
Metronidazole - oral	<i>Neonate Page 45, other Page 13</i>
Morphine	<1 month, 150mcg/kg, 1-11 months 200mcg/kg, 1 - 5yrs 2.5 - 5 mg, 6 – 12 yrs 5 – 10 mg
Multivitamins	<6 months 2.5mls daily, >6months 5mls 12 hrly
Nystatin (100,000 iu/ml)	1ml 6hrly (<i>2 weeks in HIV positive children</i>)
Paracetamol	10-15mg / kg 6 to 8 hrly
Pethidine, im	0.5 to 1mg / kg every 4- 6 hours
Phenobarbitone	<i>Page 12</i>
Potassium	Oral: 1 - 4 mmol/kg/day (<i>same dose for i.v route</i>)
Prednisolone - tabs	Asthma 1mg / kg daily (<i>usually for 3 days</i>)
Quinine	<i>Page 25</i>
Salbutamol	IV in hospital only over 5 mins – <2yrs 5 microgram/kg, ≥ 2yrs up to 15 microgram/kg max dose 250 micrograms
<i>IV therapy should only be used on an HDU, ideally with a monitor, and MUST be given slowly as directed</i> <i>Oral salbutamol should ONLY be used if inhaled therapy is not possible and for a maximum duration of 1 week. Use inhaled steroid for persistent asthma</i>	Nebulised 2.5mg/dose as req'd (see 'Page 34') Inhaled (100 microgram per puff) 2 puffs via spacer repeated as req'd acutely – see page 34 for emergency use - or 2 puffs up to 4-6 hrly for short-term maintenance or outpatient treatment. Oral 1mg/dose 6-8hrly aged 2-11 months, 2mg/dose 6-8hrly aged 1 - 4 yrs (1 week only)
Vitamin A	Age
<i>Once on admission, not to be repeated within 1 month.</i>	< 6 months 50,000 u stat
<i>For malnutrition with eye disease repeat on day 2 and day 14</i>	6 – 12 months 100,000 u stat
	> 12 months 200,000 u stat
Vitamin D – Rickets	< 6 months 3,000 u = 75 micrograms
<i>Low dose regimens daily for 8 – 12 wks or high dose stat. <u>Calcium 50mg/kg/day</u> for first week of treatment.</i>	> 6 months 6,000 u = 150 micrograms
	stat regimen 300,000 u = 7,500 micrograms or 7.5 mg Stat
Vitamin D – Maintenance	< 6 months 200 - 400 u (5 – 10 µg)
<i>After treatment course</i>	> 6 months 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	> 6 mths 20mg, ≤ 6mths 10mg od, 14 days

Emergency drugs – Diazepam and Glucose (*NB 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 approx. 4 - 5cm)				Glucose, 5mls/kg of 10% glucose over 5 - 10 minutes	
	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
3.00	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
4.00	1.2	0.25	2.0	0.4	20	
5.00	1.5	0.30	2.5	0.5	25	
6.00	1.8	0.35	3.0	0.6	30	
7.00	2.1	0.40	3.5	0.7	35	
8.00	2.4	0.50	4.0	0.8	40	
9.00	2.7	0.55	4.5	0.9	45	
10.00	3.0	0.60	5.0	1.0	50	
11.00	3.3	0.65	5.5	1.1	55	
12.00	3.6	0.70	6.0	1.2	60	
13.00	3.9	0.80	6.5	1.3	65	50% Glucose and <u>5%</u> Glucose: 10 mls syringe: ✓ 1 mls 50% Glucose ✓ 9 mls 5% Glucose
14.00	4.2	0.85	7.0	1.4	70	
15.00	4.5	0.90	7.5	1.5	75	
16.00	4.8	0.95	8.0	1.6	80	
17.00	5.1	1.00	8.5	1.7	85	
18.00	5.4	1.10	9.0	1.8	90	20 mls syringe: ✓ 2 mls 50% Glucose ✓ 18 mls 5% Glucose
19.00	5.7	1.15	9.5	1.9	95	
20.00	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	Phenytoin, maintenance 5mg/kg daily
	im / oral	im - mg	oral - tabs	im / oral	iv / oral / ng
2.0	30	10	-	5	<i>Tablets may be crushed and put down ngt if required.</i>
2.5	37.5	12.5	-	6.25	
3.0	45	15	½ tab	7.5	
4.0	60	20	½ tab	10	
5.0	75	25	1 tab	12.5	75
6.0	90	30	1 tab	15	90
7.0	105	35	1 tab	17.5	105
8.0	120	40	1 tab	20	120
9.0	135	45	1½ tab	22.5	135
10.0	150	50	1½ tab	25	150
11.0	165	55	1½ tab	27.5	165
12.0	180	60	2 tabs	30	180
13.0	195	65	2 tabs	32.5	195
14.0	210	70	2 tabs	35	210
15.0	225	75	2½ tab	37.5	225
16.0	240	80	2½ tab	40	240
17.0	255	85	2½ tab	42.5	255
18.0	270	90	3 tabs	45	270
19.0	285	95	3 tabs	47.5	285
20.0	300	100	3 tabs	50	300
					100

Intravenous / intramuscular antibiotic doses – AGES 7 DAYS AND OLDER (NN doses see Page 45).

Weight (kg)	Penicillin*	Ampicillin or Flucloxacillin (50mg/kg)	Chloramphenicol (25mg/kg)	Gentamicin (7.5mg/kg) im or iv over 3-5 mins	Ceftriaxone iv/im <u>Max 50mg/kg 24hrly</u> for neonates** Meningitis / V Sev Sepsis, 100mg/kg over 30-60 min. OD	Metronidazole (7.5mg/kg)
	iv / im	iv / im	iv / im	24 hrly	50mg/kg	iv
	6 hrly	8 hrly	6hrly - meningitis			12 hrly < 1m, ≥ 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

*NB. Double Pen doses if treating Meningitis and age > 1 month

** Not recommended if jaundiced

Oral antibiotic doses - For neonatal doses see Page 45.

Weight kg	Amoxicillin, oral, 25mg/kg/dose		Cloxacillin / Flucloxacillin 15mg/kg/dose		Chloramphenicol 25mg/kg/dose		Ciprofloxacin 15mg/kg/dose	Metronidazole 7.5mg/kg/dose
	mls susp 125mg/5ml	250mg caps	mls susp 125mg/5ml	250mg caps or tabs	mls susp 125mg/5ml	250mg caps	250mg tabs	200mg tabs
	12 hrly	12 hrly	8 hrly	8 hrly	6 hrly	6 hrly	12 hrly (for 3 days)	8 hrly
3.0	5	1/2*	2.5	1/4	4	n/a		
4.0	5	1/2*	2.5	1/4	4	n/a	1/4	
5.0	5	1/2*	5	1/4	6	n/a	1/4	1/4
6.0	5	1/2*	5	1/2	6	n/a	1/4	1/4
7.0	7.5	1/2*	5	1/2	8	n/a	1/2	1/2
8.0	7.5	1/2*	5	1/2	8	n/a	1/2	1/2
9.0	7.5	1	5	1/2	8	n/a	1/2	1/2
10.0	10	1	5	1	12	1	1/2	1/2
11.0	10	1	10	1	12	1	1	1/2
12.0	10	1	10	1	12	1	1	1/2
13.0	10	1	10	1	12	1	1	1/2
14.0	15	2	10	1	12	1	1	1
15.0	15	2	10	1	15	1	1	1
16.0	15	2	10	1	15	1	1	1
17.0	15	2	10	1	15	1	1	1
18.0	15	2	10	1	15	1	1	1
19.0	20	2	10	1	15	1	1	1
20.0	20	2	10	1		2	1	1

*Amoxicillin syrup should be used and capsules divided ONLY if syrup is not available

Initial Maintenance Fluids / Feeds – Normal Renal Function

Note:

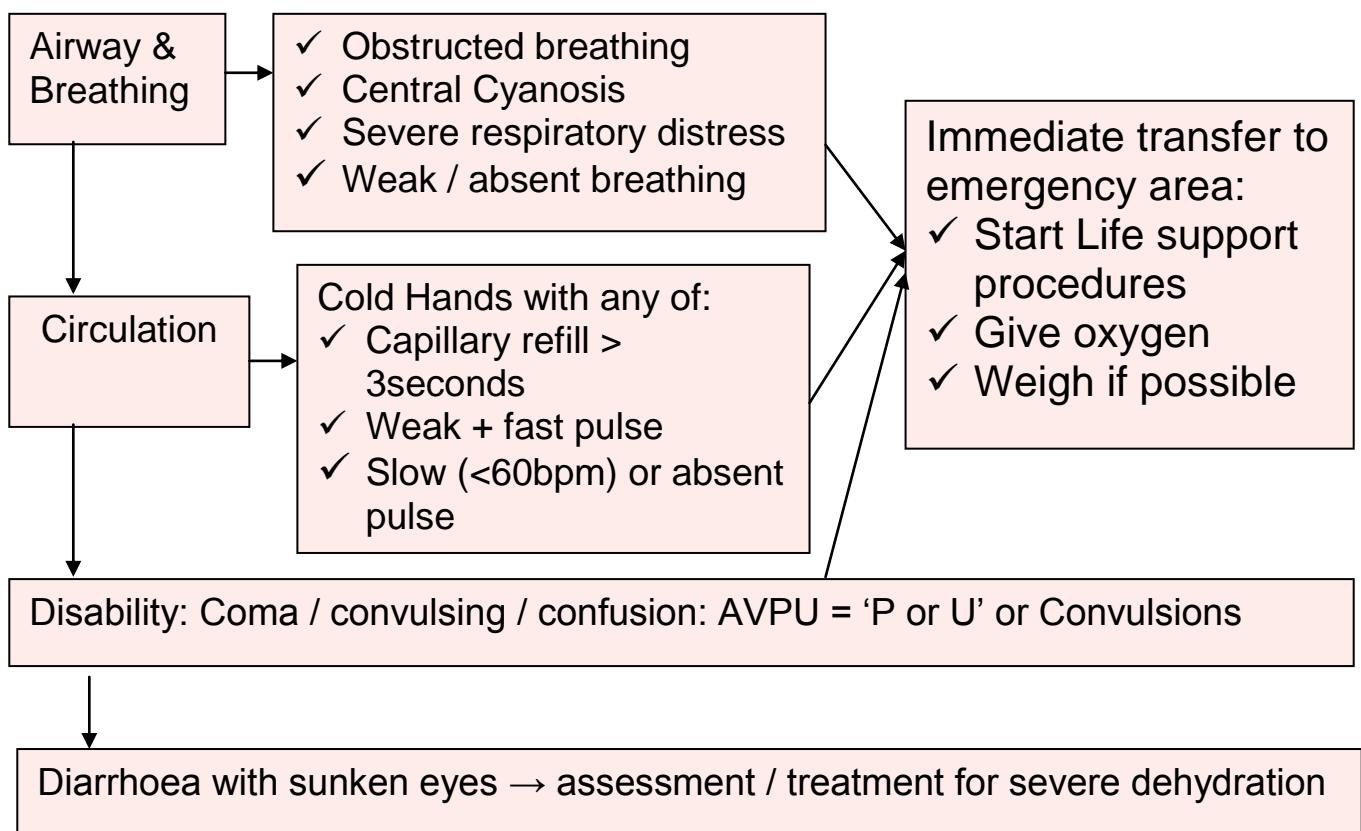
- Children should receive 1-2 mmol/kg/day of potassium
- **Feeding** should start as soon as safe and infants may rapidly increase to 150mls/kg/day of feeds as tolerated (50% more than in the chart).
- Add 50mls 50% dextrose to 450mls Half Strength Darrow's to make HSD/5% dextrose a useful maintenance fluid.
- Drip rates are in drops per minute

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

Triage of sick children

Emergency Signs:

If history of trauma ensure cervical spine is protected.



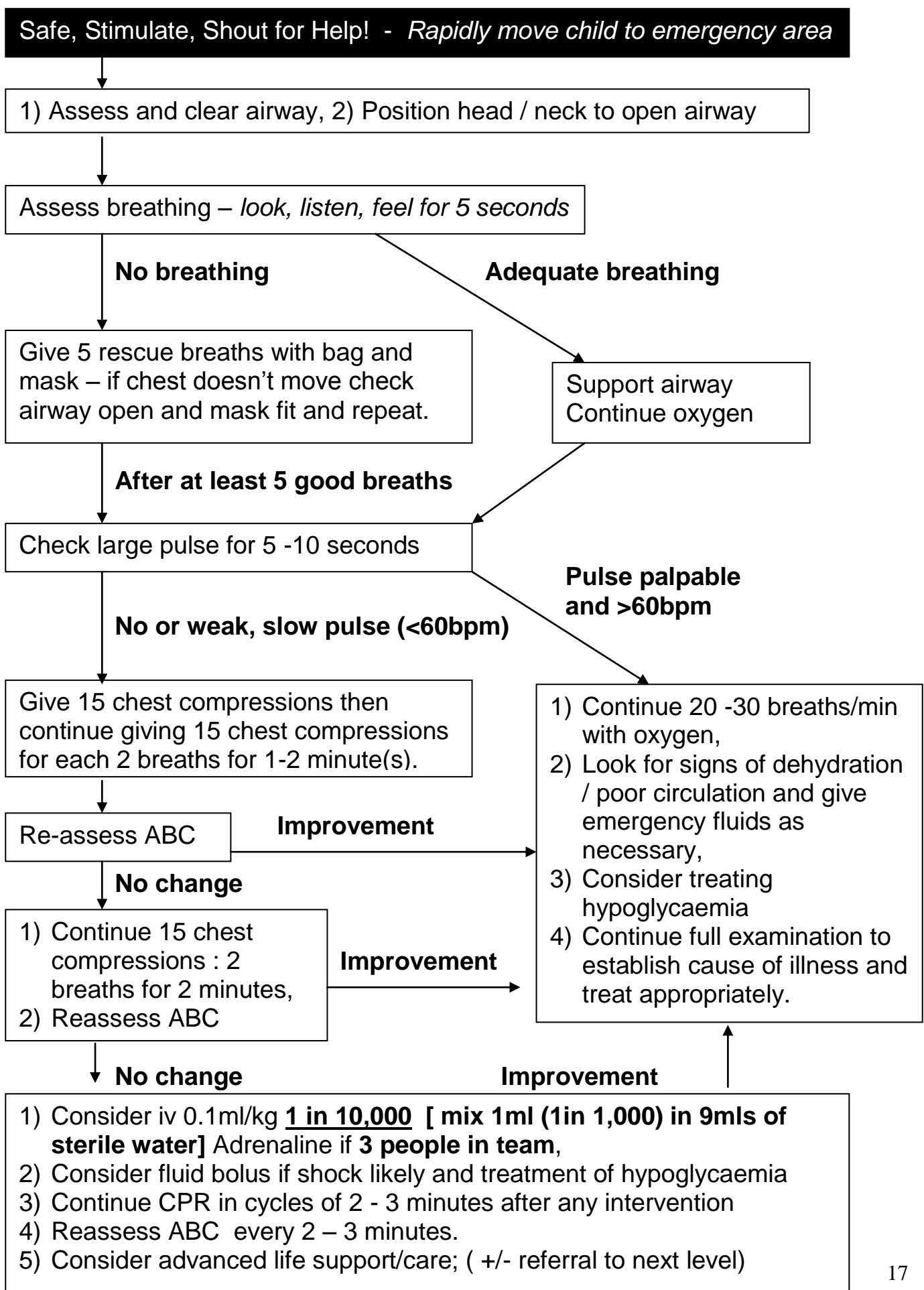
Priority Signs

- ✓ Tiny - Sick infant aged < 2 months
- ✓ Temperature – very high > 38.5°C, very low < 35.5°C
- ✓ Trauma – major trauma
- ✓ Pain – child in severe pain
- ✓ Poisoning – mother reports poisoning
- ✓ Pallor – severe palmar pallor
- ✓ Restless / Irritable / Floppy
- ✓ Respiratory distress
- ✓ Referral – has an urgent referral letter
- ✓ Malnutrition - Visible severe wasting
- ✓ Oedema of both feet
- ✓ Burns – severe burns

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

Non-urgent – Children with none of the above signs

Infant / Child Basic Life Support – Cardio-respiratory collapse



Management of the infant / child without trauma WITH SIGNS OF LIFE –

Assessment prior to a full history and examination

Obs	<p>Safe Stimulate – if not Alert Shout for Help – if not Alert Setting for further evaluation</p>	<p>Eye contact / movements Shout unless obviously alert If not Alert place on resus couch If alert it may be most appropriate to continue evaluation while child is with parent</p>
A	<p>Assess for obstruction by listening for stridor / airway noises. Look in the mouth if not alert Position – if not Alert (appropriate for age)</p>	<p>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</p>
B	<p>Assess adequacy of breathing</p> <ul style="list-style-type: none"> • Cyanosis? • Grunting? • Head nodding or bobbing? • Rapid or very slow breathing? • Indrawing? • Deep / Acidotic breathing <p>If signs of respiratory distress listen for wheeze</p>	<p>Decide:</p> <ul style="list-style-type: none"> • Is there a need for oxygen? • Is there a need for immediate bronchodilators?
C	<p>Assess adequacy of circulation</p> <ul style="list-style-type: none"> • Large pulse – <i>very fast or very slow</i>? • Coldness of hands and line of demarcation? • Capillary refill? > 3 sec • Peripheral pulse – weak or <i>not palpable</i>? • (Note initial response to stimulation / alertness) • Check for severe pallor <p>If signs of very poor circulation</p> <ul style="list-style-type: none"> • Check for signs of severe malnutrition(oedema/ visible wasting) <p>If not shock but significant circulatory compromise</p> <ul style="list-style-type: none"> • Check for severe dehydration 	<p>Decide:</p> <p>If shock (all 4 signs) AND Diarrhoea. <i>Give 20mls/kg Ringer's over 15 minutes and progress to Plan C fluids for diarrhea/dehydration</i></p> <p>If severe pallor anaemia with deep breathing/resp. distress, <i>transfuse immediately</i></p> <p>If shock (all 4 signs) and No diarrhoea or severe anaemia, give <i>20mls/kg Ringer's over 1-2 hours</i></p> <p>If No diarrhoea or anaemia & < 4 signs shock, <i>give maintenance fluids (NO BOLUS)</i></p>
D	<p>Assess AVPU</p> <p>If AVPU = A, Re-assess ABC</p> <p>If AVPU < A give 10% Dextrose</p>	<p>Decide:</p> <ul style="list-style-type: none"> • Does this child need 10% dextrose? (<i>if AVPU < A</i>)

Use of intra-osseous lines

Use IO for all children in shock if no IV access to avoid delays in initiation of fluid therapy

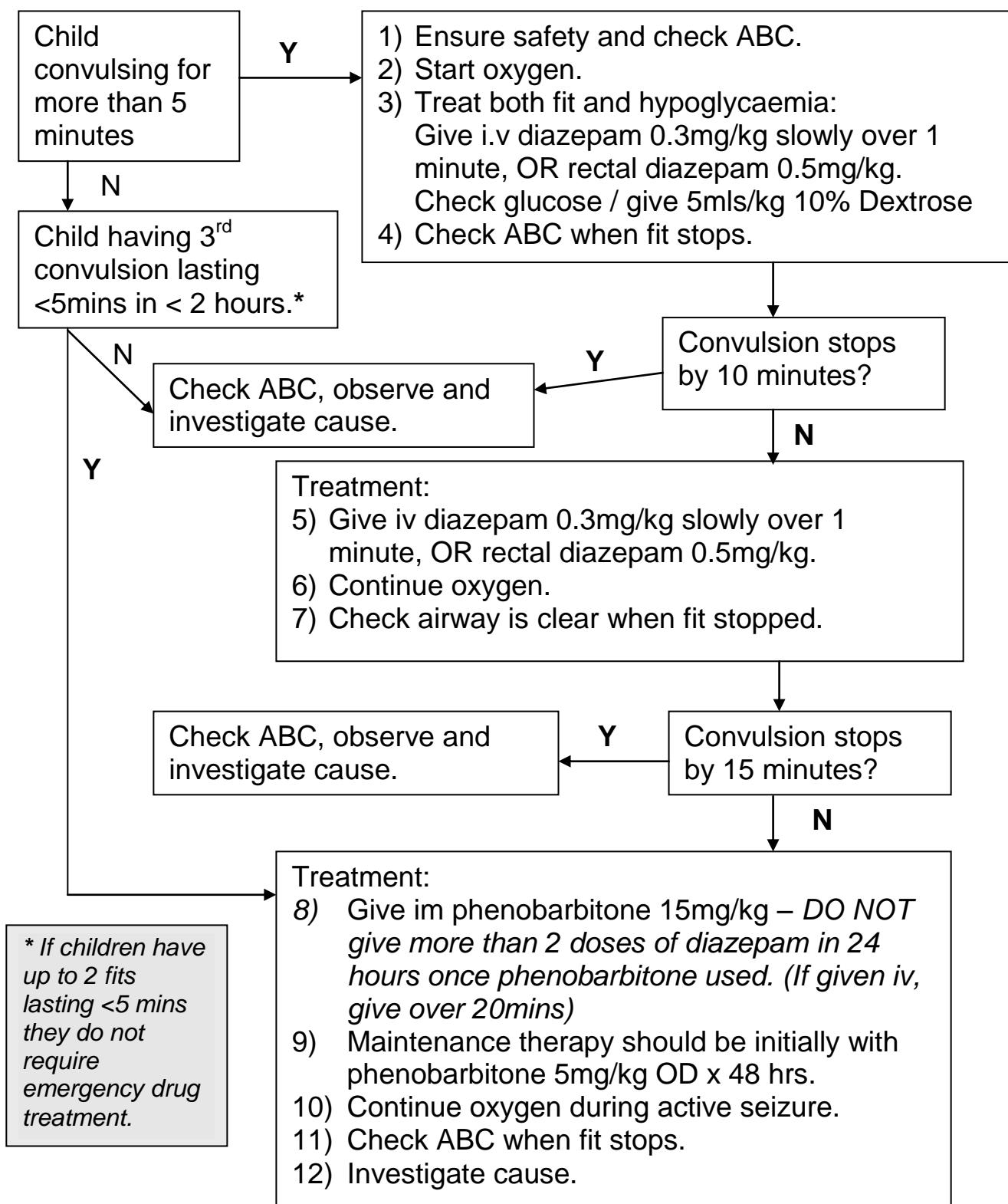
- ✓ Use IO or bone marrow needle 15-18G if available or 16-21G hypodermic needle
- ✓ Clean after identifying landmarks then use sterile gloves and sterilize site
- ✓ **Sterility** - Use antiseptic and sterile gauze to clean site (alcohol 70% or iodine or chlohexidine)
- ✓ **Site** – Middle of the antero-medial (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 5mls needle
- ✓ Slowly inject 3mls N/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 20mls / 50mls syringe will be needed for boluses
- ✓ Watch for leg / calf muscle swelling
- ✓ Replace IO access with iv within 8 hours



Treatment of convulsions

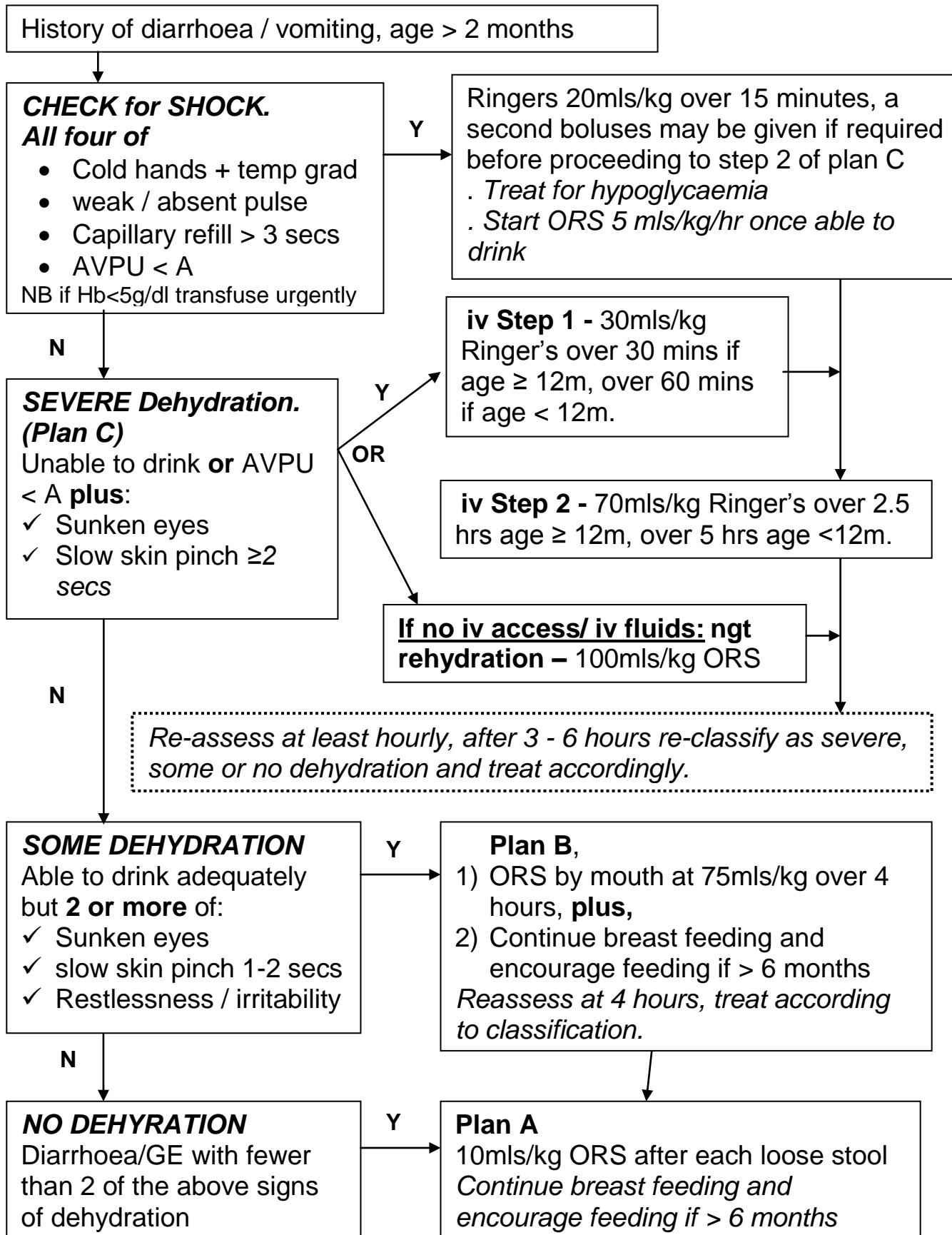
Convulsions in the first 1 month of life should be treated with Phenobarbitone 20mg/kg stat, a further 5-10mg/kg can be given within 24 hours of the loading dose with maintenance doses of 5mg/kg daily.

Age > 1 month



Diarrhoea / GE protocol (excluding severe malnutrition)

Antibiotics are NOT indicated unless there is **dysentery or persistent diarrhoea** and proven amoebiasis or giardiasis. Diarrhoea > 14 days may be complicated by intolerance of ORS – worsening diarrhoea – if seen change to iv regimens. **All cases to receive Zinc**



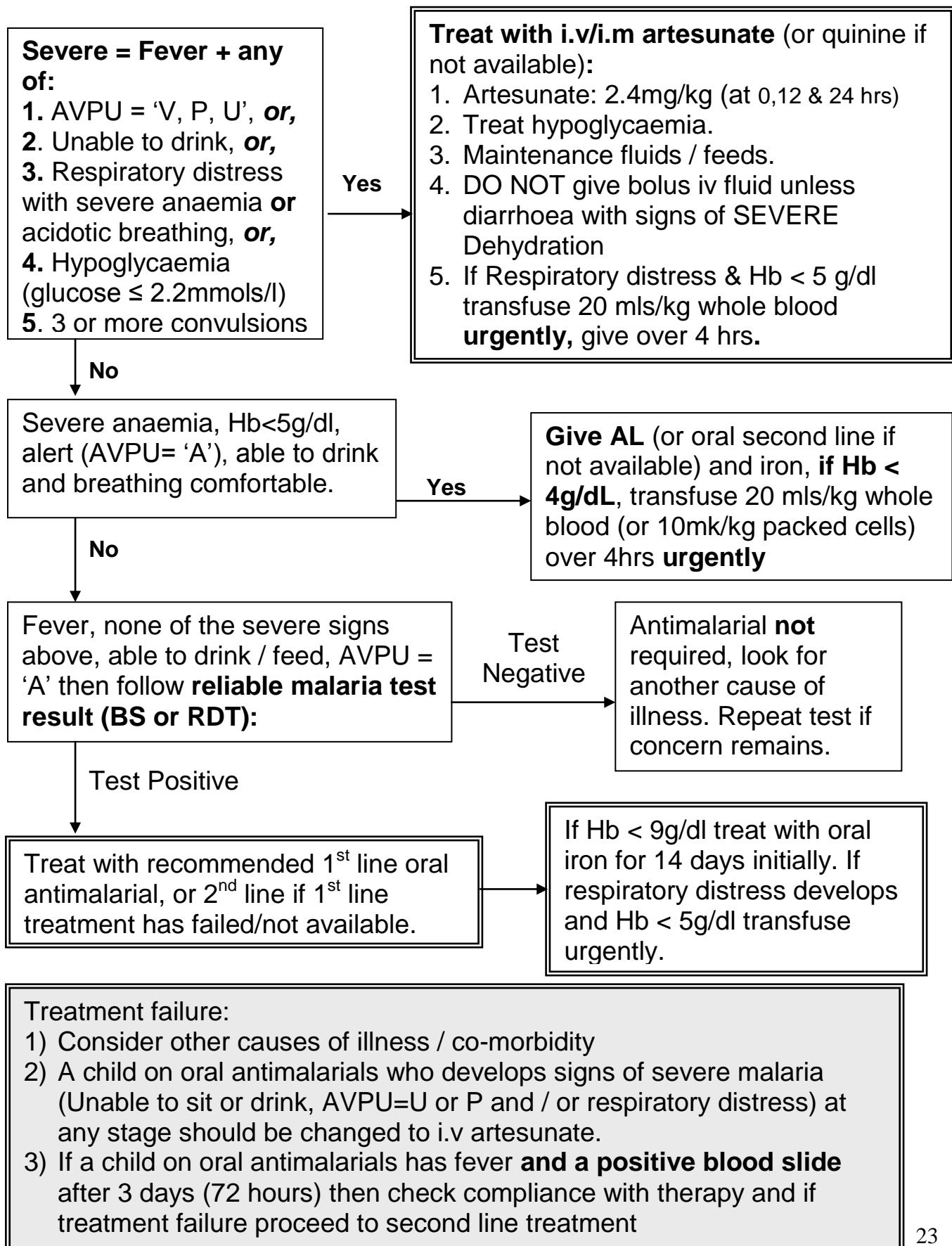
Urgent Fluid management – Child WITHOUT severe malnutrition *

Weight kg	Shock, 20mls/kg Ringer's or Saline Immediately	Plan C – Step 1		Plan C – Step 2			Plan B - 75mls/kg
		30mls/kg Ringer's	70mls/kg Ringer's or ngt ORS			Oral /ngt ORS	
		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

Treatment of 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.



Anti-malarial drug doses

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 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)	5mls	2mls
Artesunate concentration (mg/ml)	10mg/ml	20mg/ml

Quinine

For **iv infusion** typically 5% or 10% dextrose is used

- Use at least 1 ml 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 0.5-1ml of fluid for each 1mg of quinine
 - 10mg/kg dose takes 4 hours

For **i.m quinine**

- Take 1ml of the 2mls in a 600mg quinine sulphate iv vial and add 5mls water for injection – this makes a 50mg/ml solution
- If you need to give more than 3mls in a child, divide the doses and give into two i.m sites

Malaria treatment doses

- Artesunate is given iv/im for a maximum 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 Lumenfantrine
-

Weight kg	Artesunate, 2.4mg/kg At 0,12 and 24h then daily for max 7 days			Quinine, 10mg/kg	Quinine, tabs, 10mg/kg 300mg QN sulphate 8 hourly
	iv mls fo 60mg in 6mls	Dose in mg	im mls of 60mg in 3mls	iv infusion / im 8 hrly	
3.0	0.75	7.5	0.35	30	-
4.0	1	10	0.5	40	-
5.0	1.2	12	0.6	50	-
6.0	1.5	14	0.7	60	1/4
7.0	1.7	17	0.8	70	1/4
8.0	1.9	19	1.0	80	1/4
9.0	2.1	22	1.1	90	1/4
10.0	2.4	24	1.2	100	1/2
11.0	2.6	26	1.3	110	1/2
12.0	2.9	29	1.5	120	1/2
13.0	3.1	31	1.6	130	1/2
14.0	3.4	34	1.7	140	1/2
15.0	3.6	36	1.8	150	1/2
16.0	3.8	38	1.9	160	1/2
17.0	4.1	41	2.0	170	1/2
18.0	4.3	43	2.2	180	1/2
19.0	4.6	46	2.3	190	1/2
20.0	4.8	48	2.4	200	1

AL (Artemether + Lumefantrine)
(20:120mg) - Give with food or Milk
Stat, +8hrs, BD on Day 2 and Day 3

Weight	Age	Dose
<5kg	-	1/2 tablet
5 – 14 kg	3 – 35mth	1 tablet
15 – 24 kg	3 - 7 yrs	2 tablets
25 – 34 kg	9 - 11 yrs	3 tablets
> 34kg	> 12 yrs	4 tablets

**Dihydroartemisinin-piperaquine,
(Duocotexcin) OD for 3 days**

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

Measuring nutritional status

Anthropometry (body measurement) quantifies nutrition. 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 (growth velocity).

Mid-upper arm circumference

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



Weight, Height and age

Weight for height (W/H): Measure length (lying) if aged <2y 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 e.g. in the diagnosis of acute malnutrition we use W/H expressed as Z scores. Z scores can be obtained from simple tables.

Visible severe wasting tends to identify only severe cases of SAM. It is better to use MUAC.

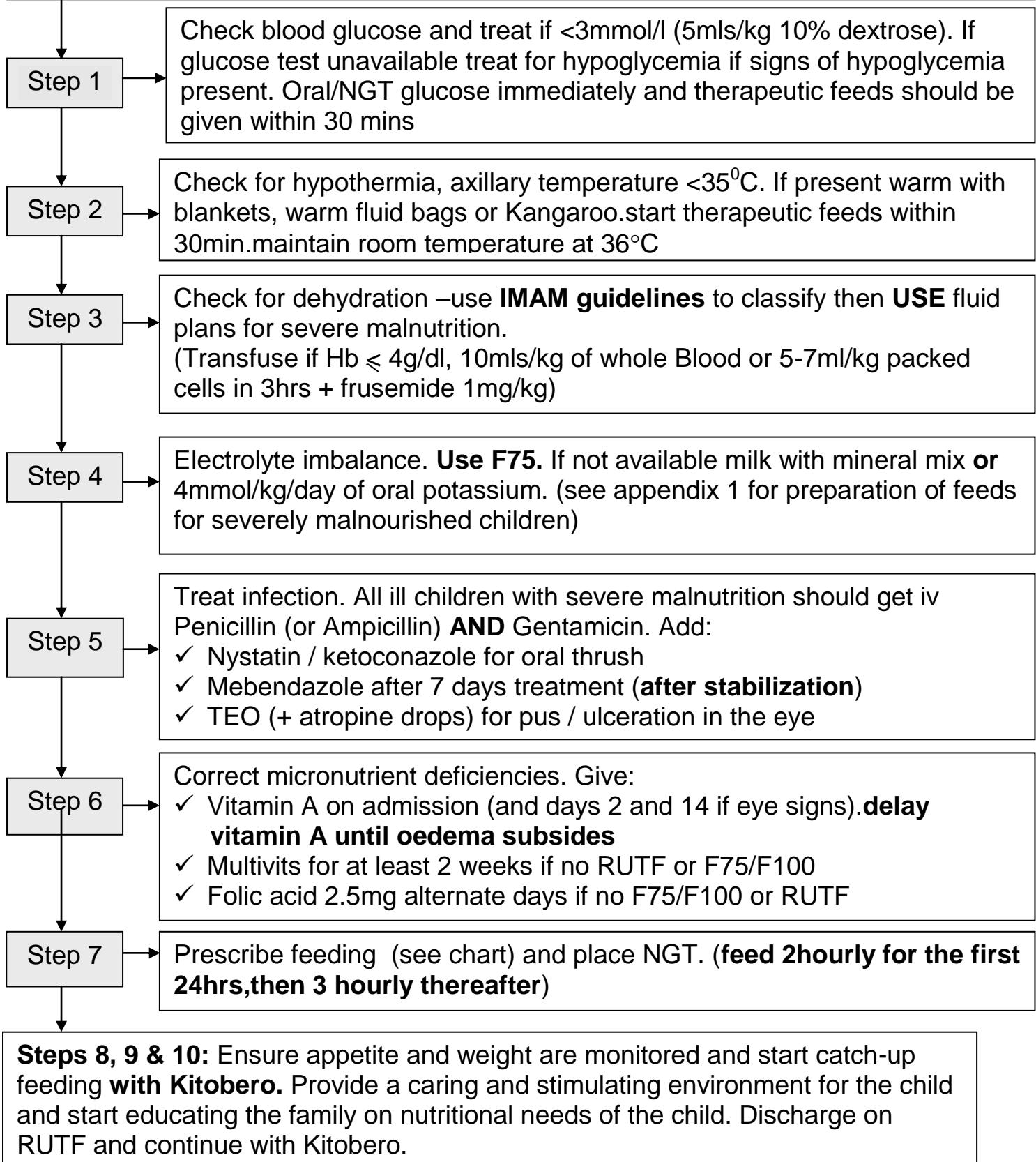
Kwashiokor = severe malnutrition (at any age)

Classifying malnutrition		
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
		Kwashiokor

Symptomatic severe malnutrition

Admit to hospital if there is;

- ✓ Visible severe wasting (buttocks) (WHZ < -3)
- ✓ Oedema or other signs of Kwashiorkor (flaky paint skin / hair changes).
- ✓ History of illness.
- ✓ Failed appetite test.



Emergency Fluid management in Severe Malnutrition

Shock: AVPU < A, plus Cold hands with temperature gradient plus absent or weak pulse plus capillary refill >3secs
 20 mls/kg in 1-2 hr of Half Strength Darrow's (HSD) in 5% dextrose or Ringers lactate. If HSD in 5% Dextrose not available it can be made by adding 50mls 50% dextrose to 450mls HSD.
If severe anaemia start urgent blood transfusion not Ringers

If improves

- switch to oral or ng fluids using Resomal at 10mls/kg/hr for up to 10 hrs
- As soon as conscious introduce F75 & reduce on amount of Resomal

If does not improve

- Give maintenance iv fluid at 4mls/kg/hr
- Transfuse 10mls/kg whole blood over 3 hours as soon as it is available
- Introduce F75 after transfusion complete.

Weight kg	Shock		Oral / ngt Resomal	Emergency Maintenance
	15mls/kg		10mls/kg/hr	4mls/kg/hr
	Half-Strength Darrows in 5% D		Resomal	HSD in 5% D
	iv		Oral / ngt	iv
Shock = over 1 hour	Drops/min if 20drops/ml giving set	10mls/kg/hr for up to 10 hours	Hourly until transfusion	
4.00	60	20	40	15
5.00	75	25	50	20
6.00	90	30	60	25
7.00	105	35	70	30
8.00	120	40	80	30
9.00	135	45	90	35
10.00	150	50	100	40
11.00	165	55	110	44
12.00	180	60	120	46
13.00	200	65	130	48
14.00	220	70	140	50
15.00	240	80	150	52

	Dry Skimmed Milk	Vegetable Oil	Sugar	Water
F 75*	25g	27g	100g	Make up to 1000mls
F 100*	80g	60g	50g	Make up to 1000mls

* Ideally add electrolyte / mineral solution and **at least** add potassium

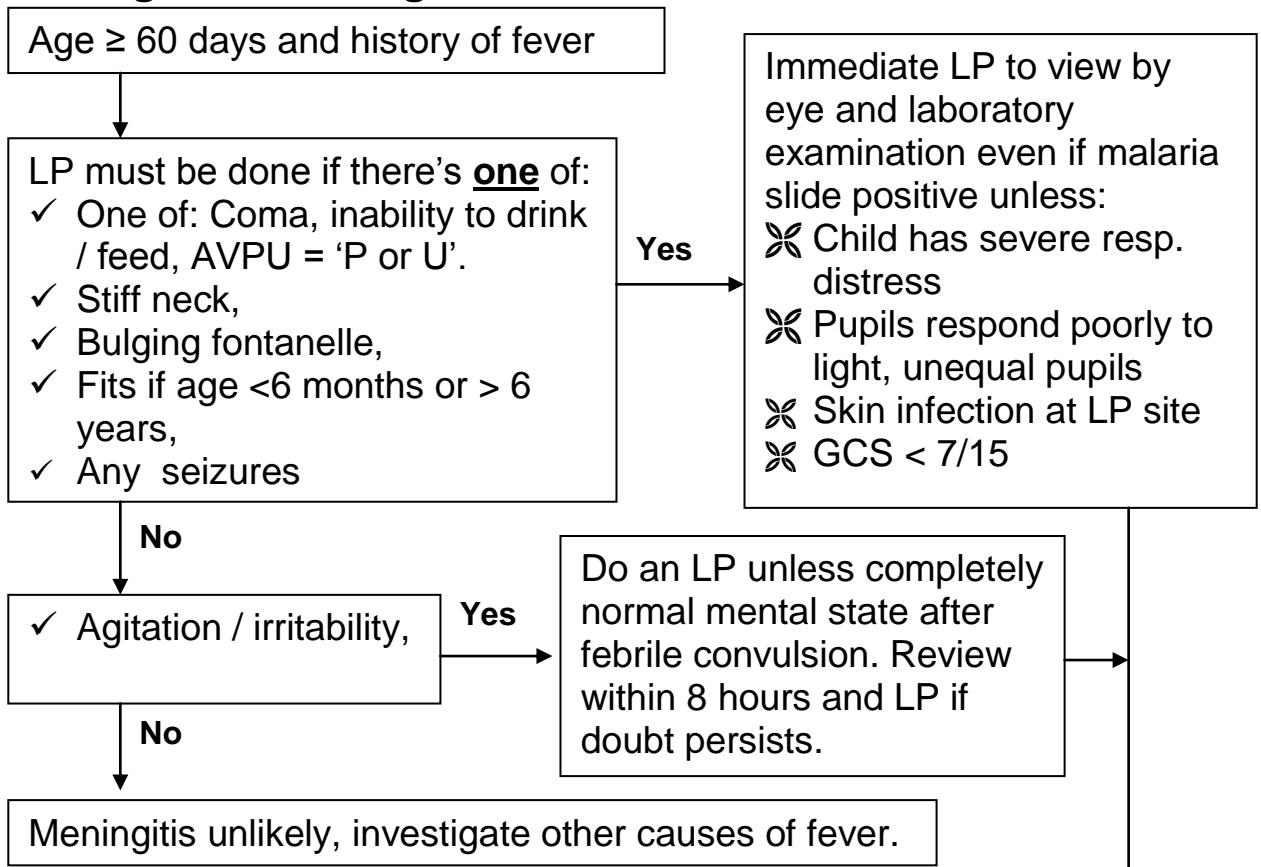
Feeding children with severe malnutrition – Breast feed & / or SDTM if aged < 6 months.

- 1) If respiratory distress or oedema get worse or the jugular veins are engorged reduce feed volumes.
- 2) When appetite returns (and oedema much improved) **change from F75 to F100**, if F100 not available change to RUTF for the first 2 days use 130-150mls/kg of F100.
- 3) When using RUTF allow the child to nibble very frequently, the child can drink liberally and additional solid foods can be introduced slowly in the first days (or RUTF can be mixed into porridge)

Weight (kg)	F75 – acute feeding				F100		RUTF if no F100 20mg/Kg	
	No or moderate oedema (130mls/kg/day)		Severe oedema, even face (100mls/kg/day)		F100 @ 150mls/kg/day			
	Total Feeds / 24 hrs	3 hourly feed volume	Total Feeds / 24 hrs	3 hourly feed volume	Total Feeds / 24 hrs	3 hourly feed volume		
4.0	520	65	400	50	600	75	-	
4.5	585	75	450	60	675	85	-	
5.0	650	80	500	65	750	95	100	
5.5	715	90	550	70	825	105	110	
6.0	780	100	600	75	900	115	120	
6.5	845	105	650	85	975	125	130	
7.0	910	115	700	90	1050	135		
7.5	975	120	750	95	1125	140		
8.0	1040	130	800	100	1200	150		
8.5	1105	140	850	110	1275	160	170	
9.0	1170	145	900	115	1350	170	180	
9.5	1235	155	950	120	1425	180	190	
10.0	1300	160	1000	125	1500	190	200	
10.5	1365	170	1050	135	1575	200	210	
11.0	1430	180	1100	140	1650	210	220	
11.5	1495	185	1150	145	1725	215	230	
12.0	1560	195	1200	150	1800	225	240	

13.0	1690	211	1300	162		1950	243	260
13.5	1755	219	1350	168		2025	253	270
14.0	1820	228	1400	175		2100	262	280
14.5	1885	236	1450	181		2175	271	290
15.0	1950	244	1500	187		2250	281	300
15.5	2015	252	1550	193		2325	290	310
16.0	2080	260	1600	200		2400	300	320
16.5	2145	268	1650	206		2475	309	330
17.0	2210	276	1700	212		2550	318	340
17.5	2275	284	1750	218		2625	328	350
18.0	2340	293	1800	225		2700	337	360
18.5	2405	301	1850	231		2775	346	370
19.0	2470	309	1900	237		2850	356	380
19.5	2535	317	1950	243		2925	365	390
20.0	2600	325	2000	250		3000	375	400
20.5	2665	333	2050	256		3075	384	410

Meningitis – investigation and treatment.



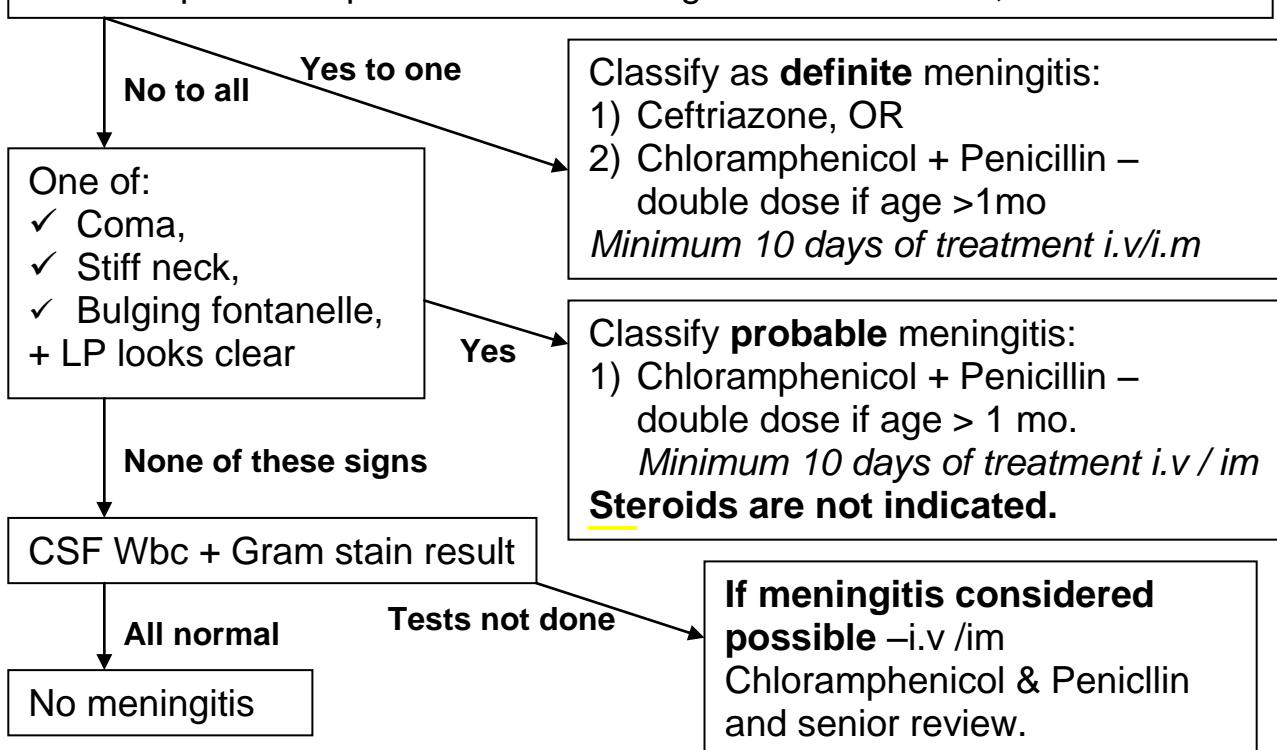
Interpretation of LP and treatment definitions:

Either Bedside examination:

- ✓ Looks cloudy in bottle (turbid) and not a blood stained tap,

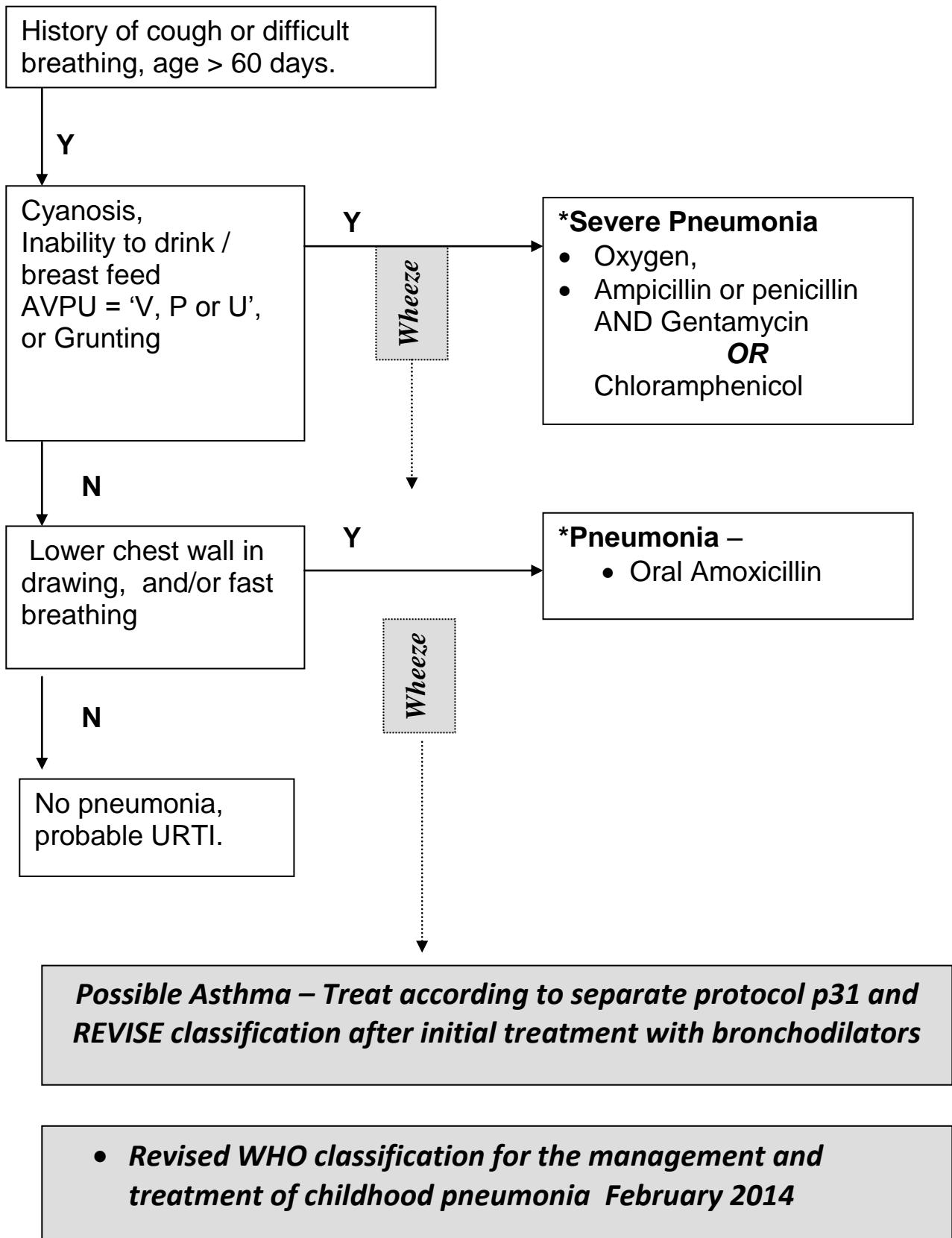
And / or Laboratory examination with one or more of (if possible):

- ✓ White cell count $> 10 \times 10^6/L$
- ✓ Gram positive diplococci or Gram negative cocco-bacilli,



Pneumonia protocol for children aged 2 - 59 months.

For HIV exposed / infected children see page 36



Pneumonia treatment failure definitions

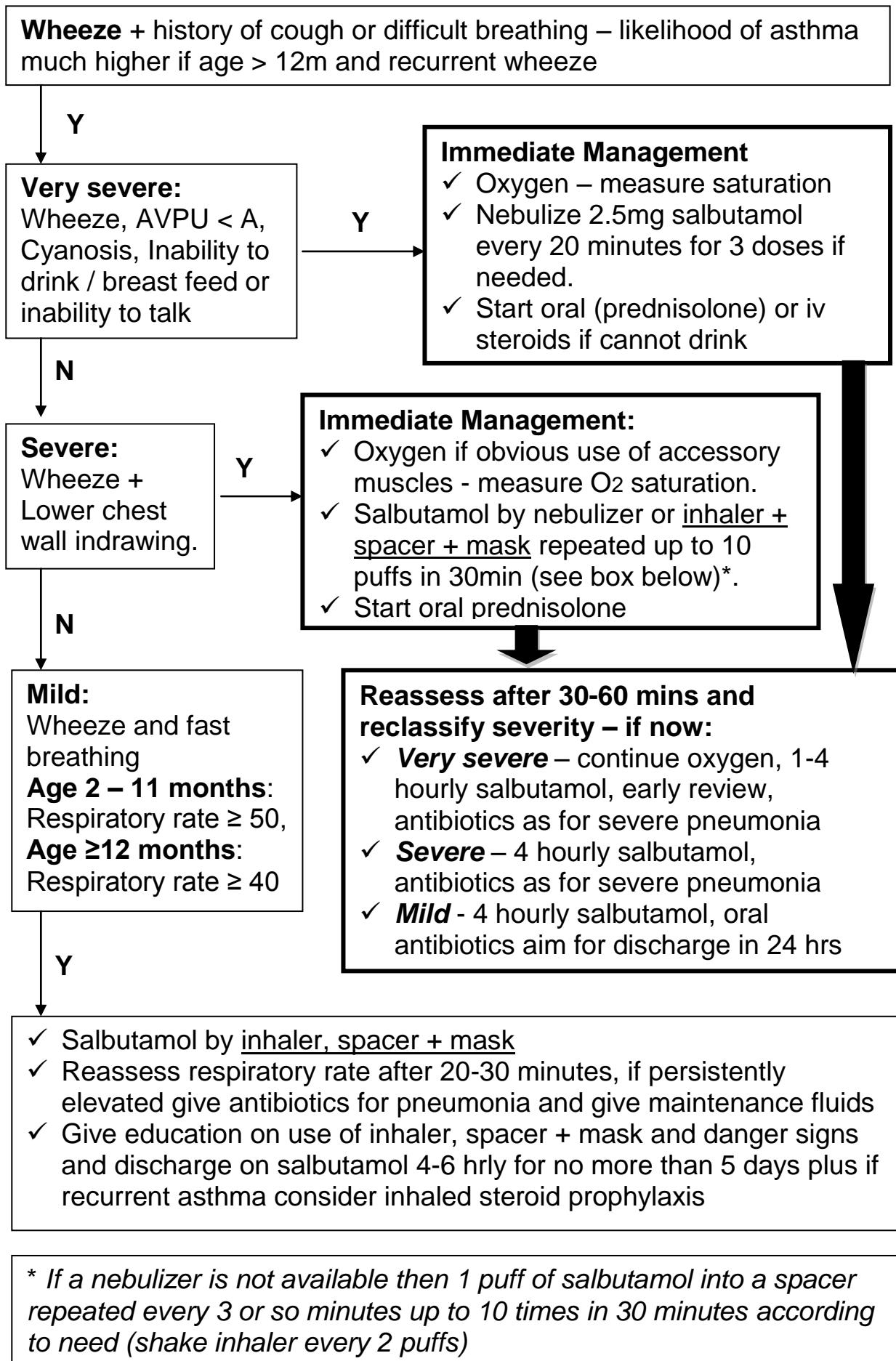
HIV infection may underlie treatment failure – testing helps the child.

See HIV page for indications for PCP treatment.

Definition	Action required
Any time.	
Progression of pneumonia to very severe pneumonia (development of cyanosis or inability to drink in a child with pneumonia without these signs on admission)	Change treatment from Penicillin alone to chloramphenicol AND Gentamycin.
Obvious cavitations on CXR	Treat with oral Cloxacillin* 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, cavitations etc). Do CBC and blood culture.	Switch to Ceftriaxone unless suspect Staphylococcal pneumonia then use oral cloxacillin* and gentamicin. Suspect PCP especially if <12m, an HIV test must be done - treat for Pneumocystis if HIV positive/ sero-exposed
Severe pneumonia without improvement in at least one of: <ul style="list-style-type: none"> ✓ Respiratory rate, ✓ Severity of indrawing, ✓ Fever $>37.5^{\circ}\text{C}$, ✓ Eating / drinking. 	Change treatment from penicillin to chloramphenicol
Day 5.	
At least 3 of: <ul style="list-style-type: none"> ✓ Fever, temp $>37.5^{\circ}\text{C}$ ✓ Respiratory rate >60 bpm ✓ Still cyanosed or saturation $<90\%$, consider cardiac disease ✓ Chest indrawing persistent ✓ Worsening CXR, ✓ Persistent fever and respiratory distress. 	a) If only on penicillin change to chloramphenicol. b) If on chloramphenicol change to ceftriaxone. c) Suspect PCP, do HIV test (must) - treat for PCP if HIV positive or sero-exposed. d) Consult cardiologist if? cardiac Consider TB, perform mantoux and check TB treatment guidelines.

* iv cloxacillin can cause phlebitis, oral route recommended

Possible asthma – admission management of the wheezy child



HIV – Provider Initiated Testing and Counseling (PITC), 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 Uganda
- ✓ Explain MoH guidance that ALL sick children with unknown status should have an HIV test – so their child is not being 'picked out'
- ✓ That in this situation it is **normal** to do an HIV test on a child because:
 - You came to hospital wanting to know what the problem was and find the best treatment for it,
 - Knowing the HIV test result gives doctors the best understanding of the illness and how to treat it
 - The treatment that is given to the child will change if the child has HIV
 - 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 doing PITC should record HIV testing results in the medical record and indicate whether the caretakers has been informed of the result.

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 breastfed encourage exclusive breastfeeding until 6 months then introduce complementary feed, breastfeed until 12 months of age.
- 2) Do not abruptly stop breast feeding at 6m, just add complementary feeds and continue ARV (nevirapine) until 1 week after breast feeding stops
- 3) Refer child and caregiver to an HIV support clinic – HAART should start in all HIV infected children age < 24 months as soon as the diagnosis is confirmed.
- 4) All HIV exposed / infected infants should start CTX prophylaxis from age 6 wks

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 (10mg/ml formulation)
0 - 6 weeks	1 ml (10 mg) once daily (Birth weight <2,500 grams) 1.5 ml (15 mg) once daily (Birth weight >2,500 grams)
6 w to 6 months	2 ml (20 mg) once daily
6 – 9 months	3 ml (30 mg) once daily
9 – 12 months	4 ml (40 mg) once daily

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

1. Chloramphenicol + Genta first line, Ceftriaxone reserved as second line therapy
2. High dose co-trimoxazole if aged <12mo (see below) - steroids are only indicated as additional treatment for Pneumocystis pneumonia if child is in severe respiratory distress and investigate for PTB.

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

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, 6 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 diarrhea (≥ 14 days) low-lactose or lactose free milks are recommended **if the child is ≥ 6 months of age**

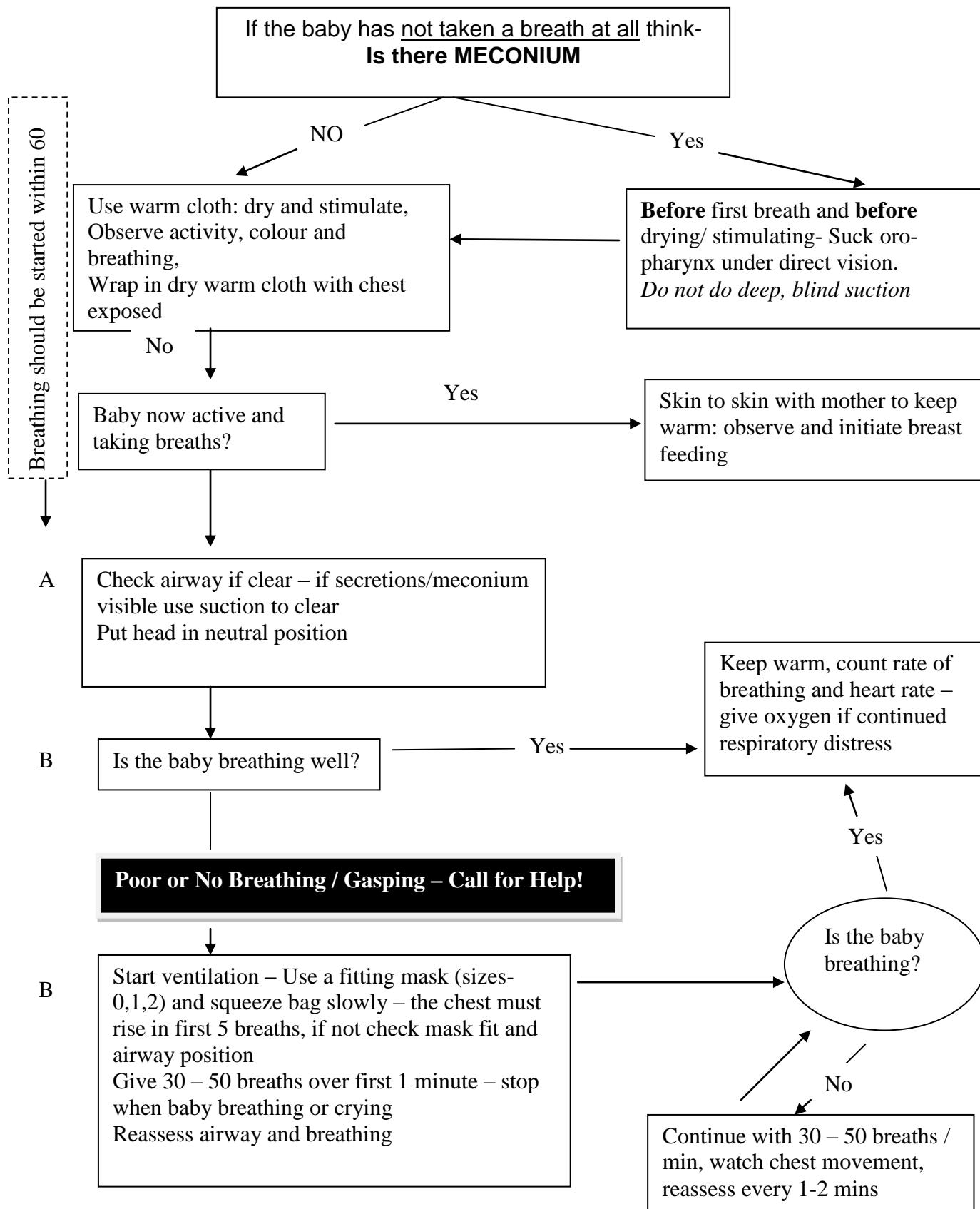
Meningitis – Request CSF examination for cryptococcus as well as traditional microscopy and culture for bacteria.

HAART – See national guidelines for latest regimens

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

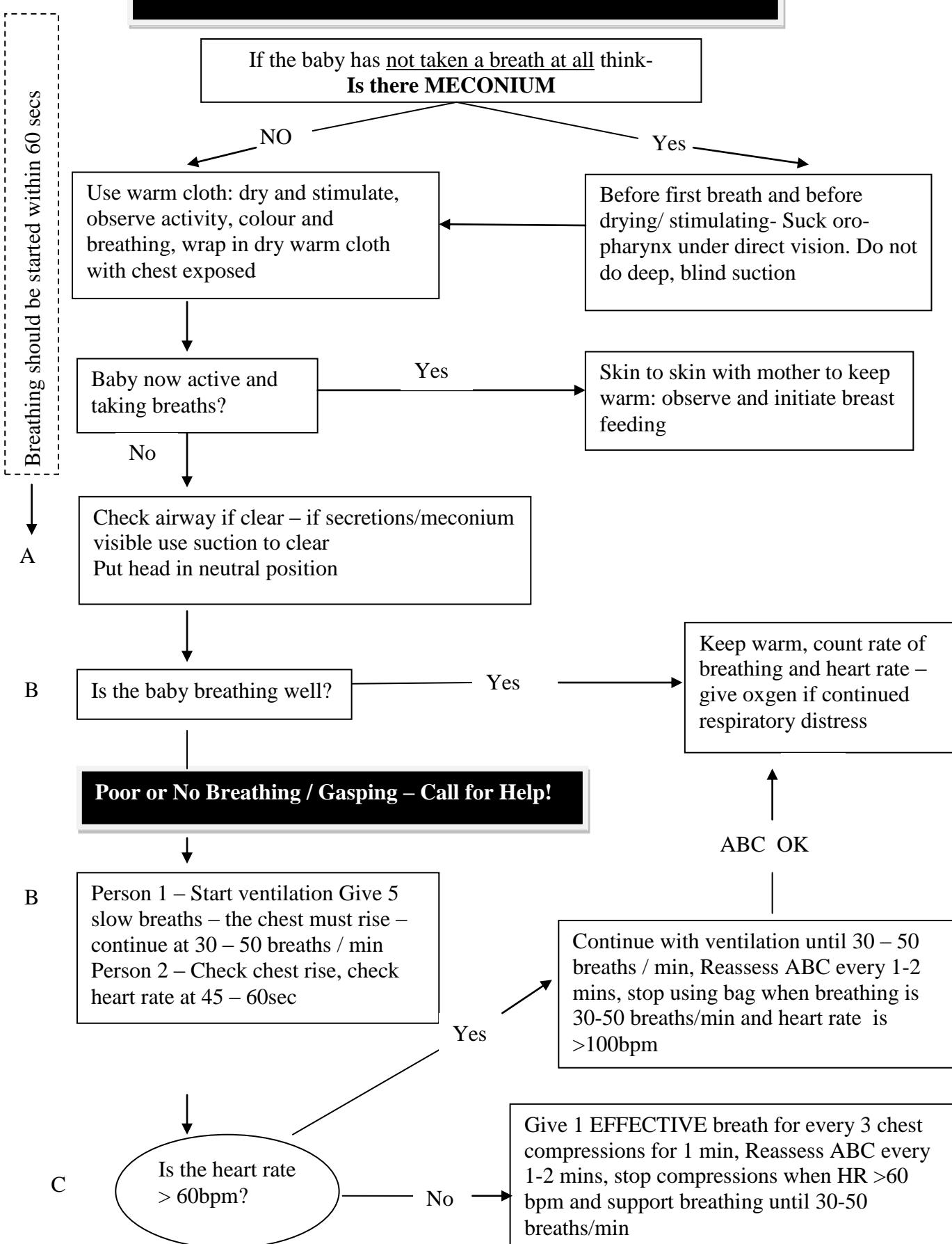
Newborn Resuscitation – for trained Health Workers – Be Prepared!

Prepare Before delivery – Equipment, Warmth, Getting Help

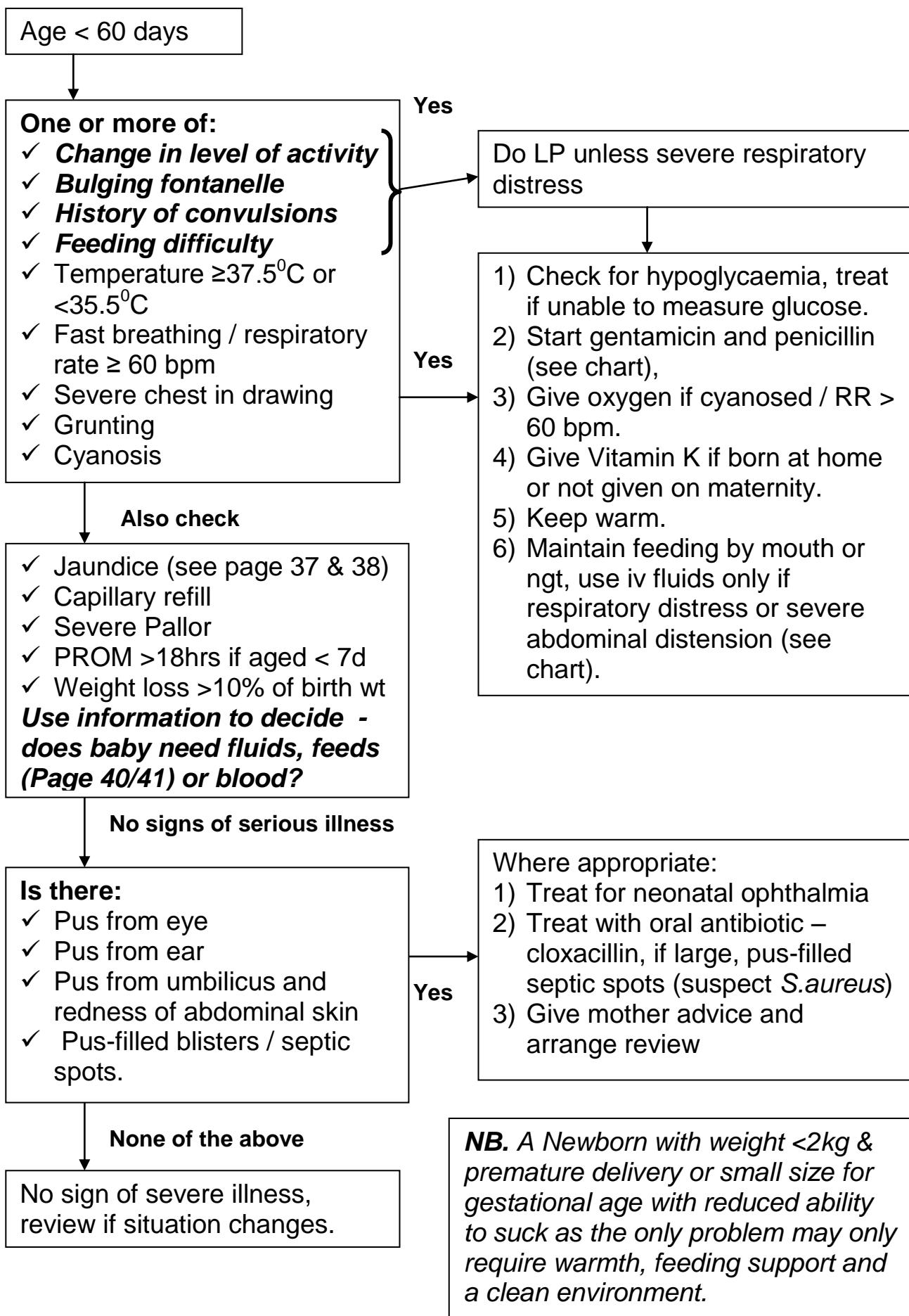


Newborn Resuscitation – for TWO trained Health Workers – Be Prepared!

Prepare Before delivery – Equipment, Warmth, Getting Help



Neonatal Sepsis / Jaundice – see Page 45 for NN Antibiotic Doses



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 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 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.

Treatment of Jaundice if Gestational Age < 37 wks

- ✓ Initiate phototherapy earlier than for full term neonates – ideally consult a gestational age specific chart
- ✓ **Exchange transfusion if baby has gestational age < 37 wks AND age is 72 hours or more if:**

Bilirubin in micromol/litre \geq gestational age \times 10

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

Duration of Treatment for Neonatal / Young Infant Sepsis

Problem	Days of treatment
Signs of Young Infant Infection in a baby breast feeding well.	<ul style="list-style-type: none"> 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. Blood culture negative. 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	<ul style="list-style-type: none"> 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. Blood culture negative. Oral antibiotics should be continued for a <u>further 5 days</u>.
Clinical or radiological pneumonia.	<ul style="list-style-type: none"> IV / IM antibiotics should be continued for a minimum of 5 days or until completely well for 24 hrs. For positive LP see below. For positive blood culture see sensitivity report.
Severe Neonatal Sepsis	<ul style="list-style-type: none"> The child should have had an LP and a blood culture 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	<ul style="list-style-type: none"> 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.

NB: IM antibiotics for pre-referral treatment

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.

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

- 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 term neonate , 0.5mg im if preterm neonate**

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 Feeding/Fluid requirements	Age	Total Daily Fluid / Milk Vol.
✓ 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	60 mls/kg/day
✓ Day 1 - Sick baby or Weight <1.5kg start with 24hrs iv 10%D – Table B	Day 2	80 mls/kg/day
✓ From Day 2 unless baby very unwell start NGT feeds - Begin with 5mls each 3hrly feed if <1.5kg; 7.5mls 3hrly if \geq 1.5kg <2kg; and 10mls 3hrly if \geq 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	Day 3	100 mls/kg/day
✓ 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.	Day 4	120 mls/kg/day
✓ Please ensure sterility of iv fluids when mixing / adding	Day 5	140 mls/kg/day
✓ Always use EBM for NGT feeds unless contra-indicated	Day 6	160 mls/kg/day
✓ 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.	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 who cannot be fed orally/via ngt on FULL volume

Weight (kg)	1.0 - 1.1	1.2 - 1.3	1.4 - 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	3.0 - 3.1	3.2 - 3.3	3.4 - 3.5	3.6 - 3.7	3.8 - 3.9
Day 1	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10
Day 2	4	4	5	6	6	7	8	8	9	10	10	11	12	12	13
Day 3	5	5	6	7	8	9	10	10	11	12	13	14	15	15	16
Day 4	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Day 5	6	8	9	10	11	12	13	15	16	17	18	19	20	22	23
Day 6	7	9	10	11	13	14	15	17	18	19	21	22	23	25	26
Day 7+	8	10	11	13	14	16	17	19	20	22	23	25	26	28	29

C. Standard regimen for introducing NGT feeds in a VLBW or sick newborn after 24hrs IV fluids

Weight (kg)	1.0 - 1.1 IVF mls per hr		1.2 - 1.3 IVF mls per hr		1.4 - 1.5 IVF mls per hr		1.6 - 1.7 IVF mls per hr		1.8 - 1.9 IVF mls per hr		2.0 - 2.1 IVF mls per hr		2.2 - 2.3 IVF mls per hr		2.4 - 2.5 IVF mls per hr	
	IVF NGT 3hrly feed	IVF NGT 3hrly feed	IVF NGT 3hrly feed													
Day 1	3	0	3	0	4	0	4	0	5	0	5	0	6	0	6	0
Day 2	2	5	3	5	3	5	3	8	4	8	4	10	4	10	5	10
Day 3	1	10	2	10	3	10	2	15	3	15	2	20	3	20	4	20
Day 4	1	15	2	15	3	15	1	22	2	22	0	30	2	30	3	30
Day 5	0	18	1	20	2	20	0	30	1	30	0	36	0	39	1	40
Day 6	0	21	0	25	2	25	0	34	0	38	0	42	0	45	0	50
Day 7+	0	24	0	30	0	33	0	38	0	42	0	48	0	51	0	56

Intravenous / intramuscular antibiotics aged < 7 days

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

Oral antibiotics aged < 7 days

	Amoxycillin,	Ampicillin / Cloxacillin
	25mg/kg	25mg/kg
Weight kg	125mg/5mls	125mg/5mls
2.00	12 hrly	12 hrly
2.50	2	2
3.00	3	3
4.00	3	4

Ophthalmia Neonatorum:

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

- ✓ Amikacin 7.5-10 mg/kg/dose bd 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

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

Appendix 1: 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 O₂ concentration – approx 30-35%
Naso-pharyngeal (long) catheter	Neonate – not recommended Infant / Child – 1 – 2 L/min O₂ concentration – approx 45%
Plain, good fitting oxygen face mask	Neonate / Infant / Child – 5 - 6 L/min (check instructions for mask) O₂ concentration – approx 40 - 60%
Oxygen face mask with reservoir bag	Neonate / Infant / Child – 10 - 15 L/min O₂ concentration – approx 80 - 90%

Appendix 2: Preparation of therapeutic feeds for severely malnourished children

1. Dietary management of infants < 6 months with acute malnutrition

All infants with acute malnutrition that are less than six month with or without prospect of breastfeeding should be managed on diluted F100 (also known as specially diluted therapeutic milk – SDTM) during hospital care. After discharge from hospital, infants without prospect of breastfeeding are fed on replacement feeds like animal milk.

Preparation of diluted F100 (SDTM)

Mix one sachet of F100 (410g) in 2.8L of water to make 3.2 L of SDTM. OR

Add 350 ml of water to 1 l of prepared F 100 to make 1.335 L of SDTM

Note: SDTM can be used as an alternative to F75 in case of shortage of F75

2. Dietary management of infants > 6 months and children with acute malnutrition

Preparation of therapeutic feeds F75 and F100

F75 and F100 contain all the elements (milk, fat, sugar, minerals and vitamins) needed for the treatment of acute severe malnutrition. The milk must be diluted in warm chlorinated or boiled water. Make sure that the temperature is not above 40°C to avoid damaging the vitamins.

PREPARATION

Add one sachet of powder (410g) to 2 litres of water to make 2.4 litres of milk. Sachets should not be spilt. If you have few patients and you have to prepare small quantity of milk, follow the instructions below.

Smaller volumes can be mixed using the red scoop (4.1g) included with the F75 package (add 20 ml water per red scoop (4.1g) of F75)

3. Preparation of local therapeutic feeds

Can use either dry skimmed milk (DSM), dried whole milk (DWM), fresh cow's milk, fresh goat's milk, whole eggs or egg yolks with other ingredients including oil, sugar and pre-cooked cereals. Combined mineral vitamin mix (CMV) must be added to locally made up milks to achieve the micronutrient requirements. If CMV is not available, a mineral vitamin mix can be made, though it is difficult to prepare the necessary ingredients in such minute quantities.

PREPARATION

F75 add 25g of DSM to 27g of vegetable oil and to 100g of sugar then make up to 1000mls of water.

F100 add 80g of DSM to 60g of vegetable oil and to 50g of sugar then make up to 1000mls of water.

Ideally add electrolyte/ mineral solution and at least add potassium.

4. Preparation of kitoobero

Kitoobero is a multi-mix food prepared from a carbohydrate and two protein sources (plant and animal origin). It is fed to children six months and above.

How to prepare kitoobero using beans, meat and matooke mixture.

Ingredients: 1 palm of dry beans or peas (90g), 1 fist of meat (60g), 3 fingers of matooke (300-500g), 1 pinch of salt, $\frac{1}{2}$ mug of water (250ml).

1. Measure the dry beans and soak overnight for about 6 hours. Remove the skins and wash them. The skinned beans will now become 2 palmful (180g).

2. Scrape the meat, mix it with water which had been boiled and cooled, in a container and try to separate the particles of the meat

3. Peel the matooke, cut into small pieces and wash them.

4. Mix all the ingredients in a clean saucepan. Cover and steam for 3 hours.

5. When the food is ready, mash and divide it into two equal halves, one for lunch and the other for supper.

Any tuber (irish potatoes, sweet potatoes, cassava, yams) can be prepared in a similar way. Dry peas can be prepared the way as dry beans.

IMAM GUIDELINES: Dehydration

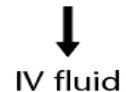
Treatment of dehydration

Conscious



- 5 ml/kg/30 min first 2 hours
- 5 to 10 ml/kg/hr 12 hours

Unconscious



- Darrow's solution
or ½ saline and 5% glucose
or Ringer lactate and 5% glucose
at 15 ml/kg the first hour and reassess

- If improving, 15 ml/kg second hour
- If conscious, NGT: ReSoMal
- If not improving => Septic shock