Ministry of Health

Republic of Kenya.

Basic Paediatric Protocols

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Foreward.

This pocket book is for use by doctors, clinical officers, senior nurses and other senior health workers who are responsible for the care of young children at the first referral level where basic laboratory facilities and essential drugs are available. The guidelines require the hospital to 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.

These guidelines focus on the inpatient management of the major causes of childhood mortality such as pneumonia, diarrhoea, malaria, severe malnutrition, meningitis, HIV, neonatal and related conditions. The basis of these guidelines is the WHO IMCI Manual, “The Management of the Child with a Serious Illness or Severe Malnutrition.” This booklet is a result of a workshop in Machakos in February 2004 drawing together experienced paediatricians from the Ministry of Health, Kenyatta National Hospital, KEMRI and the University of Nairobi. It deals with the management of seriously ill children in the first 48 hours.

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.

Dr. James Nyikal, MBS.
Director of Medical Services.

Principles of good care:

1) Hospitals must have basic equipment and drugs in stock at all times (see list of essential items).
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) 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.
6) 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.
7) Correct supportive care – particularly adequate feeding - is as important as disease specific care.
8) Laboratory tests should be used appropriately and use of unnecessary drugs needs to be avoided.
9) An appropriate discharge and follow up plan needs to be made when the child leaves hospital.
10) Good hand washing practices and good ward hygiene improve outcomes of admission.

Specific policies:

- ✓ All admissions should receive Vitamin A unless they have received a dose within the last 1 month. (Malnourished children with eye signs receive repeated doses).
- ✓ 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 be weighed, the weight recorded and used for calculation of drug doses.
- ✓ Respiratory rates must be counted for 1 minute.
- ✓ Conscious level should be assessed on all children admitted using the AVPU scale where:
  - A = **A**lert and responsive
  - V = responds to **V**oice or **V**erbal instructions, eg turns head to mother's call. ***These children may still be lethargic or unable to drink / breastfeed (prostrate).***
  - P = responds to **P**ain 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. If the child manages this but does not respond to a voice they are in this 'P' category. If the child only lifts or bends the arms but is not able to locate the hand causing the pain they have failed this test and are unconscious. 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 = **U**nconscious, cannot push a hand causing pain away or fail to make a response at all.
- ✓ Children with AVPU = P or U should have their blood glucose checked. If this is not possible treatment for hypoglycaemia should be given.
- ✓ The sickest children on the ward should be near the nursing station and prioritized for re-assessment / observations.

Essential Drugs	Doses
Adrenaline 1 in 1000	0.01ml / kg s.c. for severe asthma
Adrenaline 1 in 10,000	To make this strength dilute 1 ml of 1 in 1000 adrenaline in 9 mls water for injection to make 10mls. Give 0.1ml/kg in resuscitation.
Aminophylline- iv	**Newborn** Loading dose 6mg/kg iv over 1 hour or rectal, **Maintenance (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 then 5mg/kg 6hrly
Aminophylline - oral	**Asthma:** 6mg/kg 6hrly
Amodiaquine (200mg tabs)	od for 3 days, **<7kg** 1/4 tab, **7-9kg** 1/2, 1/2, 1/4 tab, **10-14kg** 3/4, 3/4, 1/2 tab, **15-18kg** 1,1,3/4 tab
Amoxycillin	*See separate chart*
Benzyl Penicillin (X-pen)	*See separate chart*
Brufen / Ibuprofen	5 - 10 mg/kg 8 hourly
Ceftriaxone / Cefotaxime	*See separate chart*
Chloramphenicol - injection	*See separate chart*
Chloramphenicol - oral	*See separate chart*
Clotrimazole 1%	Apply paint / cream daily
Dexamethasone	For severe croup 0.6mg/kg stat
(Flu) Cloxacillin - injection	*See separate chart*
(Flu) Cloxacillin - oral	*See separate chart*
Co-artem	*See separate chart*
Co-trimoxazole (4mg/kg Trimethoprim & 20mg/kg sulphamethoxazole)	**Weight** / **240mg/ml syrup** 12hrly / **480mg tabs** 12hrly **3-6 kg** 2mls 1/4 **7-9 kg** 3.5mls 1/2 **10-14 kg** 6mls 1 **15-20 kg** 8.5mls 1
Diazepam - injection	0.3mg/kg & *See separate chart*
Diazepam - rectal	0.5mg/kg & *See separate chart*
Digoxin	15 micrograms/kg Loading dose then 5 micrograms/kg 12 hrly
Frusemide	0.5 to1mg/kg up to 6 hrly
Gentamicin	*See separate chart*
Glucose	5mls/kg 10% dextrose & *See separate chart*

Iron tabs / syrup ***200mg Ferrous sulphate tabs*** ***100mg /5mls Ferrous fumarate syrup***	**Weight**	**200mg tabs** Once daily	**Syrup 100mg/5mls** Once daily
	3-6 kg	-	1ml
	7-9 kg	1/4	1.25ml
	10-14 kg	1/2	2mls
	15-20 kg	1/2	2.5mls
Mebendazole (age > 1yr)	100mg bd for 3 days or 500mg stat		
Metronidazole - oral	*See separate chart*		
Multivitamins	<6 months 2.5mls daily, >6months 5mls 12 hrly		
Nalidixic acid	*See separate chart*		
Nystatin	1ml 6hrly *(2 weeks in HIV positive children)*		
Paracetamol	10-15mg / kg 6 to 8 hrly		
Pethidine, im	0.5 to 1mg / kg every 4- 6 hours		
Phenobarbitone - injection	*See separate chart*		
Phenobarbitone - oral	*See separate chart*		
Potassium - oral	1 - 4 mmol/kg/day		
Prednisolone - tabs	Asthma 1mg / kg daily *(usually for 3 days)*		
Quinine injection	*See separate chart*		
Quinine tabs	*See separate chart*		
Salbutamol	**Inhaled** (100 microgram per puff) 2 puffs via spacer repeated as required in an emergency or 2 puffs up to 4-6 hrly for maintenance or outpatient treatment. **Nebulised** 2.5mg/dose as required (see asthma chart) **Oral** 1mg/dose 6-8hrly aged 2-11 months, 2mg/dose 6-8hrly aged 1 - 4 yrs		
TB drugs	*See national guidelines*		
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** **< 6 months** **6 – 12 months** **> 12 months**		50,000 u 100,000 u 200,000 u
Vitamin K	**Newborns:** 1mg stat im (<1500g, 0.5mg im stat) **For liver disease:** 0.3mg/kg stat, max 10mg		
Zinc	**>6 months :** 20mg/day for 14 days. **<6months :** 10mg/day for 14 days.		

Emergency drugs – Diazepam and Glucose.

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. 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	**10 mls syringe:** ✓ 2 mls 50% Glucose ✓ 8 mls Water for injection **20 mls syringe:** ✓ 4 mls 50% Glucose ✓ 16 mls Water for Injection **50 mls syringe:** ✓ 10 mls 50% Glucose ✓ 40 mls Water for Injection
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	
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	
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 adminstration.

Weight (kg)	Phenobarb, Loading dose, 15mg/kg	Phenobarb, maintenance, 5mg/kg daily (high dose – chronic therapy)	Phenobarb maintenance 2.5mg/kg daily (starting dose – acute febrile illness)	Phenytoin, loading dose, 15mg/kg	Phenytoin, maintenance 5mg/kg daily
	im / oral	im / oral	im / oral	Oral / ng	Oral / ng
2.00	30	10	5	*Tablets may be crushed and put down ngt if required.*	
2.50	37.5	12.5	6.25		
3.00	45	15	7.5	45	15
4.00	60	20	10	60	20
5.00	75	25	12.5	75	25
6.00	90	30	15	90	30
7.00	105	35	17.5	105	35
8.00	120	40	20	120	40
9.00	135	45	22.5	135	45
10.00	150	50	25	150	50
11.00	165	55	27.5	165	55
12.00	180	60	30	180	60
13.00	195	65	32.5	195	65
14.00	210	70	35	210	70
15.00	225	75	37.5	225	75
16.00	240	80	40	240	80
17.00	255	85	42.5	255	85
18.00	270	90	45	270	90
19.00	285	95	47.5	285	95
20.00	300	100	50	300	100

Intravenous / intramuscular antibiotic doses – Ages 7 days and older.

Weight (kg)	Penicillin (50,000iu/kg)	Ampicillin or Cloxacillin (50mg/kg)	Chloramphenicol (25mg/kg)	Gentamicin (7.5mg/kg)	Ceftriaxone (50mg/kg)	Metronidazole (7.5mg/kg)
	iv / im	iv / im	iv / im	im	iv / im	iv
	6 hrly	8 hrly	6hrly - meningitis 8hrly – V.S. LRTI	24 hrly	Meningitis -12 hrly Other – 24 hrly	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 Penicillin doses if treating Meningitis and age > 1 month

Oral antibiotic doses

Weight kg	Amoxycillin, oral, 25mg/kg/dose		Cloxacillin / Flucloxacillin 15mg/kg/dose		Chloramphenicol 25mg/kg/dose		Nalidixic acid 15mg/kg/dose	Metronidazole 7.5mg/kg/dose
	mls susp 125mg/5ml	250mg caps or tabs	mls susp 125mg/5ml	250mg caps or tabs	mls susp 125mg/5ml	250mg caps	500mg tabs	200mg tabs
	12 hrly	12 hrly	8 hrly	8 hrly	6 hrly	6 hrly	6 hrly (> 3m age)	8 hrly
3.0	5	1/2	2.5	1/4	4			
4.0	5	1/2	2.5	1/4	4		1/8	1/4
5.0	5	1/2	5	1/4	6		1/8	1/4
6.0	5	1/2	5	1/2	6		1/4	1/2
7.0	7.5	1/2	5	1/2	8		1/4	1/2
8.0	7.5	1/2	5	1/2	8		1/4	1/2
9.0	7.5	1	5	1/2	8			
10.0	10	1	5	1	12	1	1/4	1/2
11.0	10	1	10	1	12	1	1/2	1/2
12.0	10	1	10	1	12	1	1/2	1/2
13.0	10	1	10	1	12	1	1/2	1/2
14.0	15	1 1/2	10	1	12	1	1/2	1
15.0	15	1 1/2	10	1	15	1	1/2	1
16.0	15	1 1/2	10	1	15	1	1/2	1
17.0	15	1 1/2	10	1	15	1	1/2	1
18.0	15	1 1/2	10	1	15	1	1/2	1
19.0	20	2	10	1	15	1	1/2	1
20.0	20	2	10	1		2	1/2	1

Initial Maintenance Fluids / Feeds – Normal Renal Function.

Note:

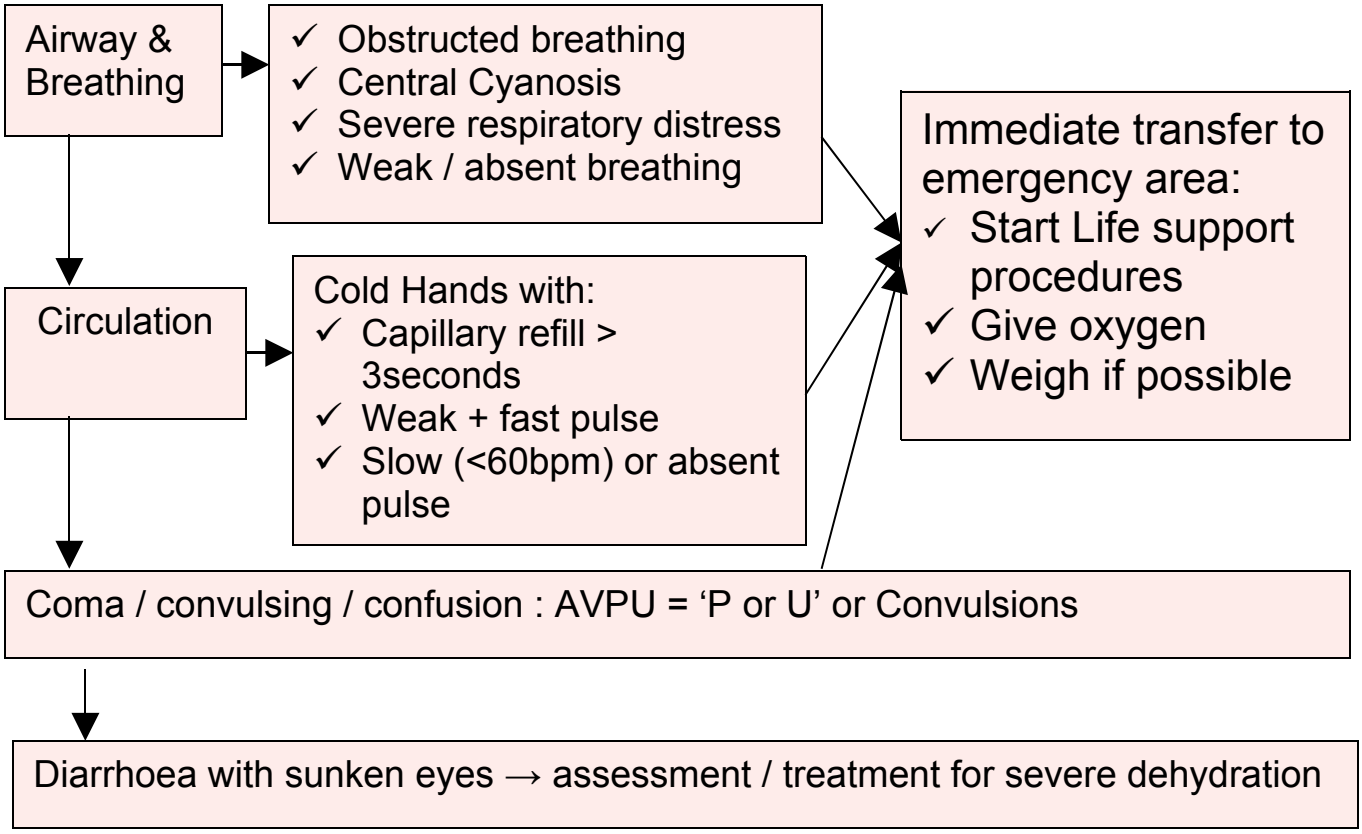
- Children should receive 1-2 mmol / kg / day of potassium
- **Feeding** should start as soon as safe and infants may rapidly increase to 150mls/kg/day of feeds as tolerated (50% more than in the chart).
- Add 50mls 50% dextrose to 450mls Half Strength Darrow's to make HSD/5% dextrose a useful maintenance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



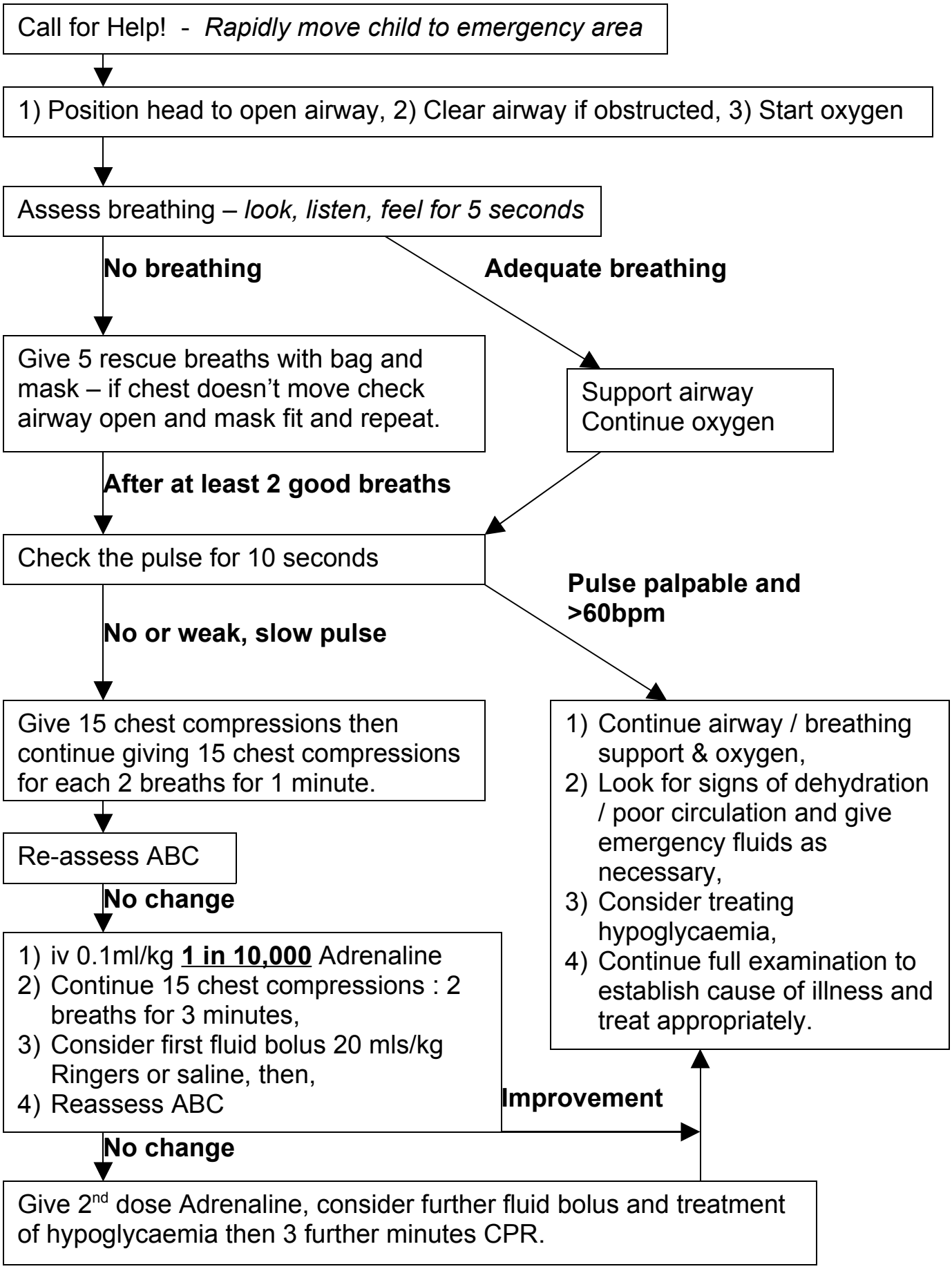
Priority Signs

- ✓ Tiny - Sick infant aged < 2 months
- ✓ Temperature – very high > 39.5^{0}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

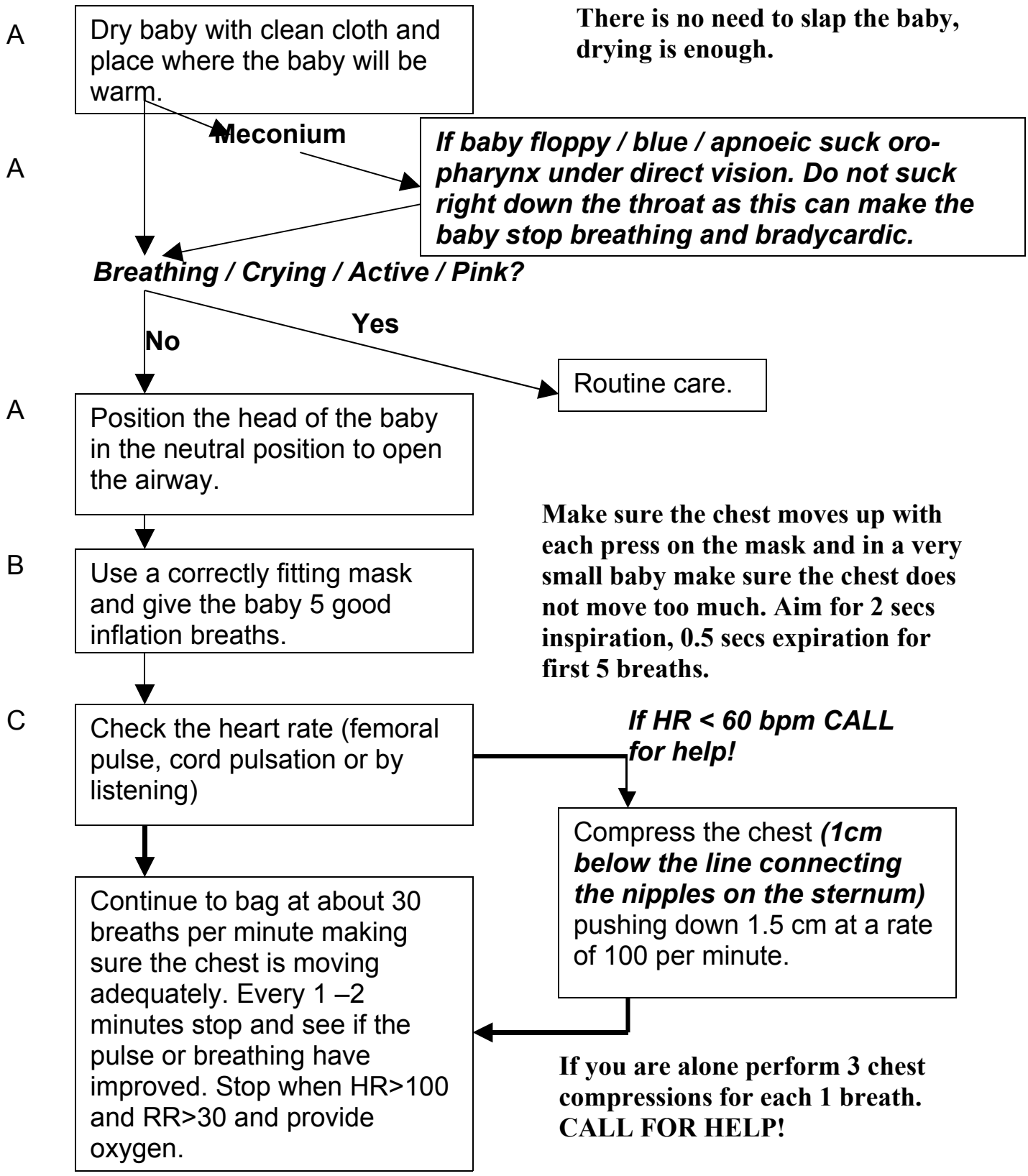
→ Front of the Queue - Clinical review as soon as possible:
- ✓ Weigh
- ✓ Baseline observations

Non-urgent – Children with none of the above signs.

Basic Life Support – Cardio-respiratory collapse.



Neonatal Resuscitation – Call for help!

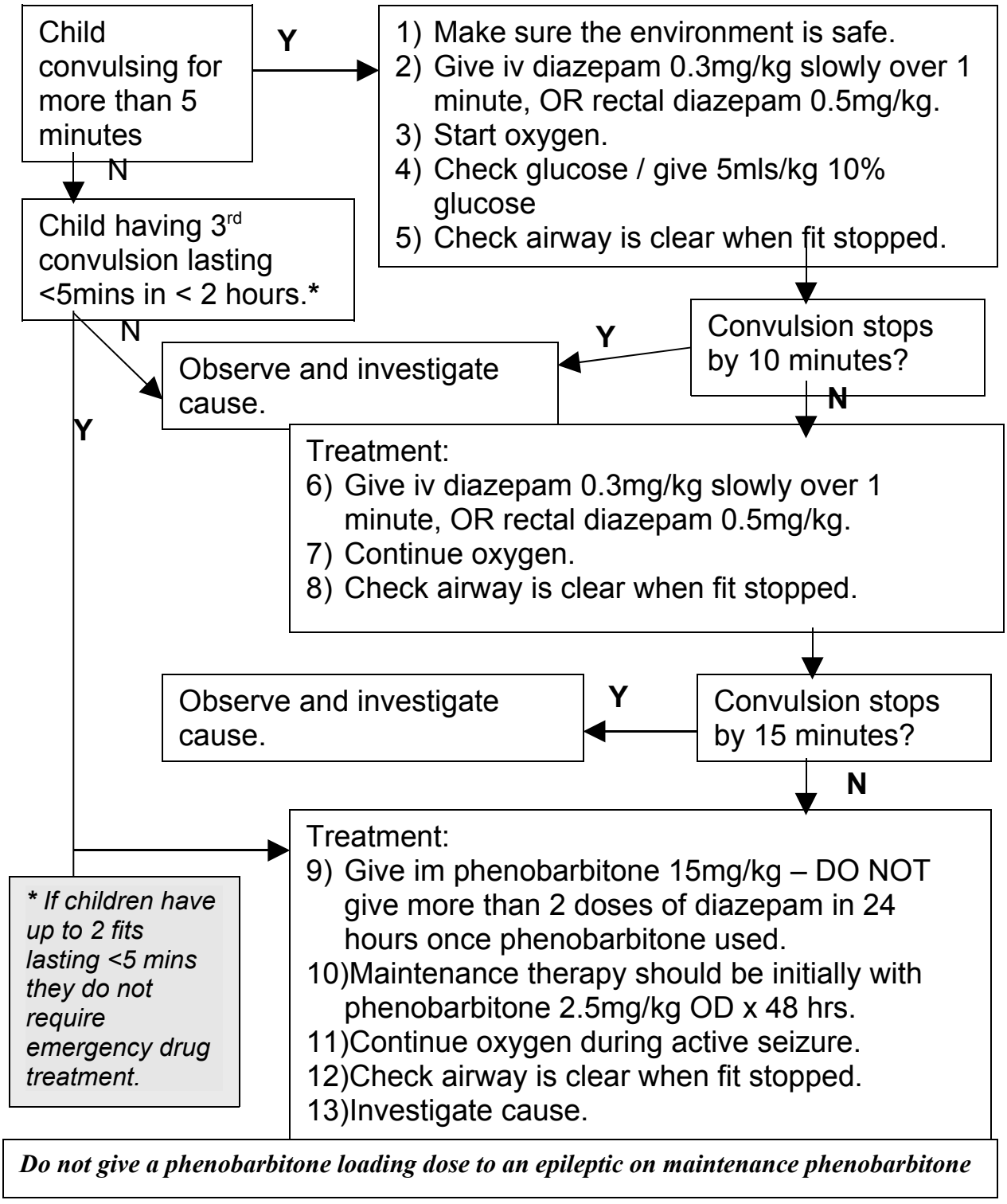


*Consider giving 5mls/kg of 10% glucose after 3-4 minutes of resuscitation if there is no response, if **TWO** people are present. Do NOT stop ventilation / cardiac compressions to give glucose.*

Treatment of convulsions.

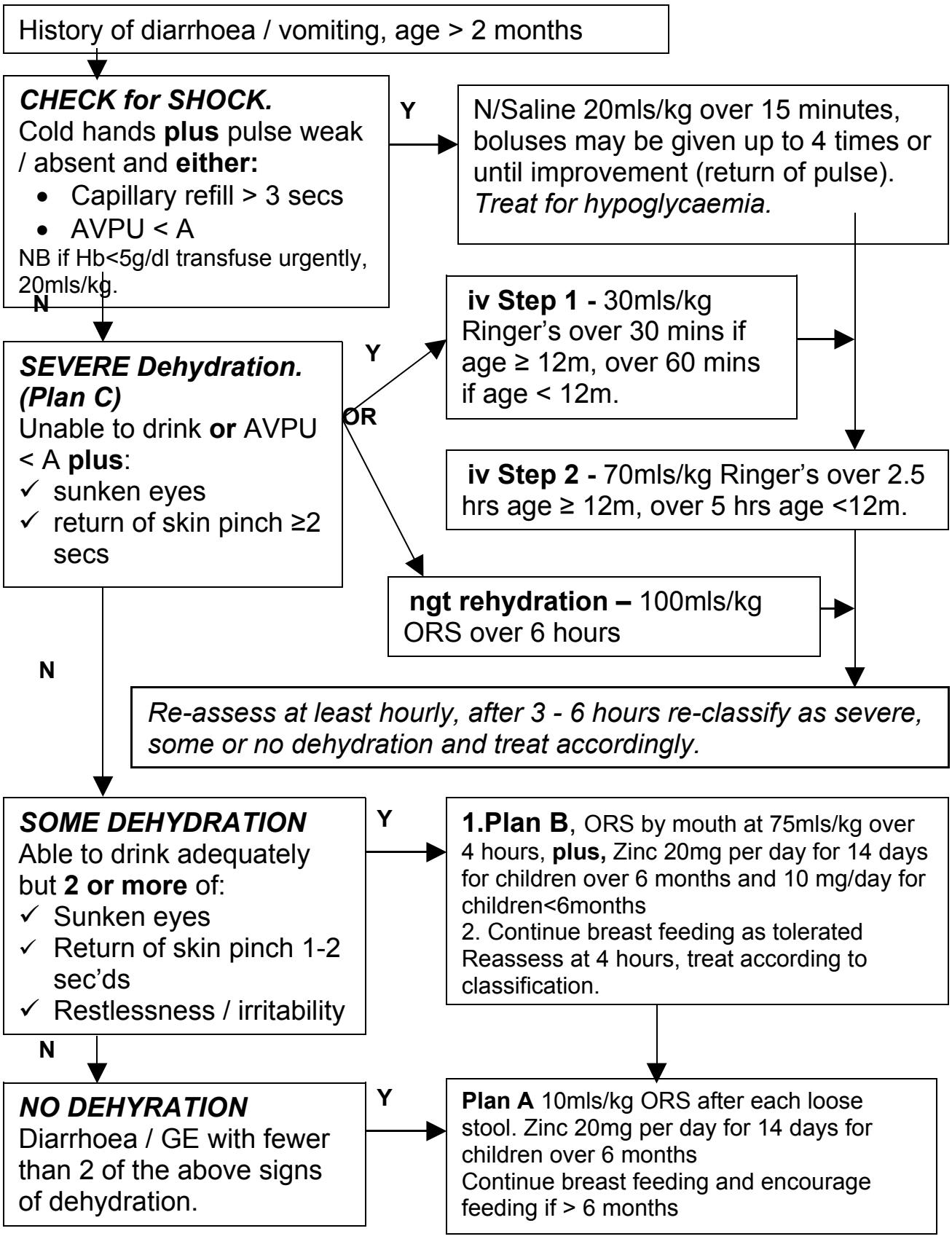
*Convulsions in the **first 1 month** of life should be treated with Phenobarbitone 20mg/kg stat, a further 5-10mg/kg can be given within 24 hours of the loading dose with maintenance doses of 5mg/kg daily.*

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.*



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 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*

HIV – who to test and how to manage.

Discuss HIV testing if the child has ***3 or more key criteria:***

- ✓ History of 2 or more episodes of persistent diarrhoea
- ✓ Family history of TB within 5 years or confirmed HIV infection in parent(s).
- ✓ Weight < 3% weight for age (below low weight line on RTH card)
- ✓ Lymphadenopathy > 1cm at 2 or more sites
- ✓ Oral thrush (age > 2 months)
- ✓ Pneumonia at presentation

Other signs that should make you consider the diagnosis of HIV include: Shingles (Herpes Zoster), persistent unexplained fever, chronic parotitis.
Children being treated for TB should be HIV screened.

Immediate Treatment.

1) Treat the presenting problems in the same way as for an HIV negative child.
2) If the child is known to be HIV positive on admission and presents with very severe pneumonia consider treatment for Pneumocystis pneumonia immediately.
3) If Pneumocystis is suspected after admission establish HIV status before treating Pneumocystis pneumonia.

Signs suggesting Pneumocystis pneumonia include:

- ✓ Fast breathing (especially very high rates > 70 bpm)
- ✓ Hypoxia / cyanosis
- ✓ Absence of crackles and wheeze
- ✓ Age < 12 months
- ✓ Bilateral interstitial infiltrates on chest X ray are sometimes seen.

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

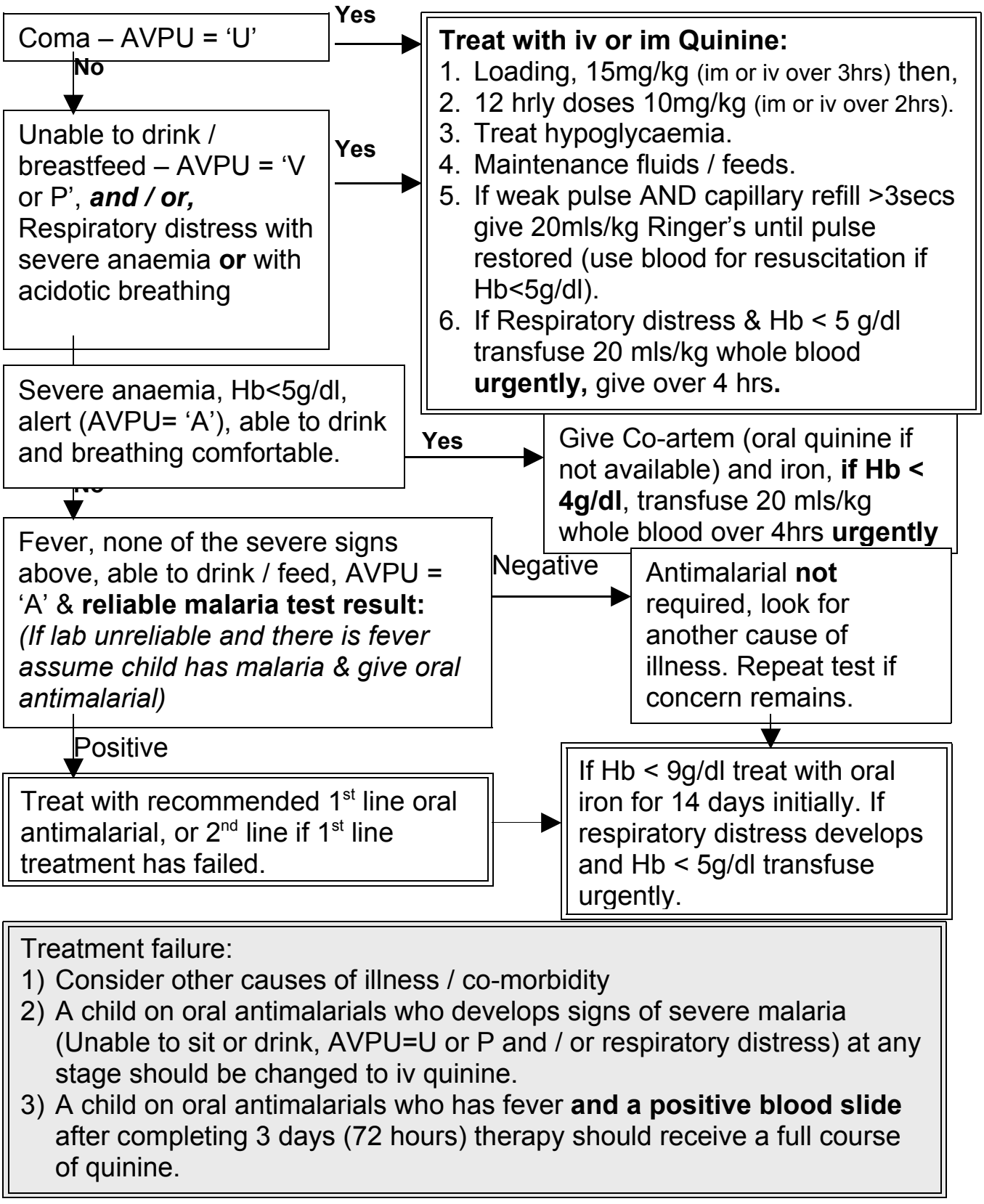
Weight	**CTZ syrup 240mg/5mls**	**CTZ Tabs 480mg/tab**	**Frequency**
1-4 kg	2.5 mls	1/4	***24hrly*** for prophylaxis, ***6 hrly*** for 3wks for PCP treatment
5-8 kg	5 mls	1/2	
9-16 kg	10 mls	1	
17-50 kg		2	

Ongoing Treatment.

1) Refer child and carers to an HIV support clinic.
2) If breast fed encourage exclusive breast feeding until 6 months then rapid weaning. If an alternative to breast feeding is affordable, feasible, accessible, safe and sustainable (AFASS) discuss this option.

Malaria Treatment in malaria endemic areas.

*If a high quality blood slide **is negative** then only children in coma or those with severe anaemia should be treated presumptively for malaria.*



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 quinine.
3) A child on oral antimalarials who has fever **and a positive blood slide** after completing 3 days (72 hours) therapy should receive a full course of quinine.

Anti-malarial drug doses - ** *Please check the tablets*.

200 mg Quinine Sulphate = 200mg Quinine Hydrochloride or Dihydrochloride
200 mg Quinine Sulphate = 300mg Quinine Bisuphate

The table below assumes the use of a 200mg Quinine Sulphate tablet.

If the tablets are **300mg Quinine sulphate or dihydrochloride** then the table is **NOT** appropriate.

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. Do not give more than 3mls per injection site. (See nursing chart for more detail)

Weight kg	Quinine loading, 15mg/kg iv infusion / im Once only	Quinine, maintenance, 10mg/kg iv infusion / im 12 hrly	Quinine, tabs, 10mg/kg 200mg QN sulphate** 8 hourly
3.0	45	30	1/4
4.0	60	40	1/4
5.0	75	50	1/4
6.0	90	60	1/2
7.0	105	70	1/2
8.0	120	80	1/2
9.0	135	90	1/2
10.0	150	100	3/4
11.0	165	110	3/4
12.0	180	120	3/4
13.0	195	130	3/4
14.0	210	140	3/4
15.0	225	150	1
16.0	240	160	1
17.0	255	170	1
18.0	270	180	1
19.0	285	190	1 1/4
20.0	300	200	1 1/4

Co-artem (with food) Stat, +8hrs, and 12 hrly Day 2 and Day 3	Age	Tabs
5 – 15 kg	3 months – 35 months	1 tablet
15 – 24 kg	3 years – 8 years	2 tablets
25 – 34 kg	9 years – 14 years	3 tablets

Symptomatic severe malnutrition.

Admit to hospital if there is a history of illness and either of:
- ✓ Visible severe wasting (buttocks)
- ✓ Oedema and low weight for age or other signs of Kwashiorkor (flaky paint skin / hair changes).

Step 1 → Check glucose and treat if <3mmol/l (5mls/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 < 4g/dl, or shock + severe pallor, 10mls/kg whole blood in 3hrs + frusemide 1mg/kg)

Step 4 → Correct electrolyte imbalance. Ideally add Mineral mix to feeds, but at least give 4mmol/kg/day extra of oral potassium.***Never use Frusemide to treat oedema!***

Step 5 → Treat infection. All ill children with severe malnutrition should get iv Penicillin (or Ampicillin) **AND** Gentamicin **AND** oral Metronidazole . Add:
- ✓ Nystatin / Clotrimazole for oral thrush
- ✓ Mebendazole after 7 days treatment.
- ✓ TEO (+ atropine drops) for pus / ulceration in the eye

Step 6 → Correct micronutrient deficiencies. Give:
- ✓ Vitamin A on admission (and days 2 and 14 if eye signs).
- ✓ Multivitamins for at least 2 weeks
- ✓ Folic acid 2.5mg every other day
- ✓ Start iron ONLY when the child is gaining weight.

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 (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.

Emergency Fluid management in Severe Malnutrition

Shock: Reduced consciousness, absent, slow (<60 bpm) or weak pulse.
15 mls/kg in 1 hr of Half Strength Darrow's in 5% dextrose.
If HSD in 5% Dextrose not available it can be made by adding 50mls 50% dextrose to 450mls HSD.

If improves

- Repeat this bolus over another 1 hour.
- Then switch to oral of ng fluids using Resomal at 10mls/kg/hour for up to 10 hours.
- As soon as conscious introduce F75 and appropriately reduce amount of Resomal given.

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.

	Shock		**Oral / ngt Resomal**	**Emergency Maintenance**
	15mls/kg		10mls/kg/hr	4mls/kg/hr
	Half-Strength Darrows in 5% Dextrose		Resomal	HSD in 5% Dextrose
	iv		Oral / ngt	iv
Weight kg	**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	45
12.00	180	*60*	120	50
13.00	200	*65*	130	50
14.00	220	*70*	140	55
15.00	240	*80*	150	60

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

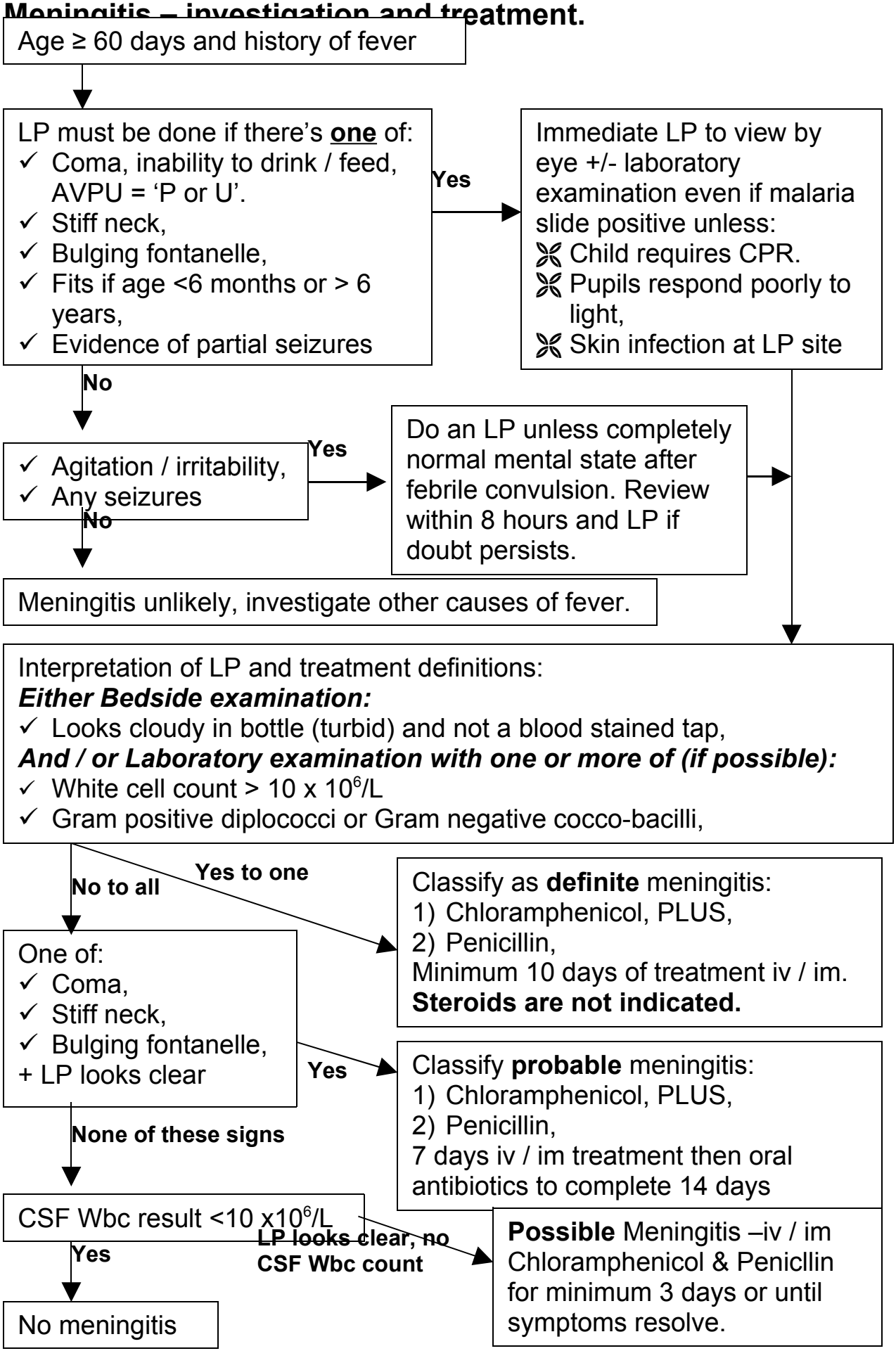
* Ideally add electrolyte / mineral solution and **at least** add potassium

Feeding children with severe malnutrition – use EBM & / or infant formula if aged < 6 months.

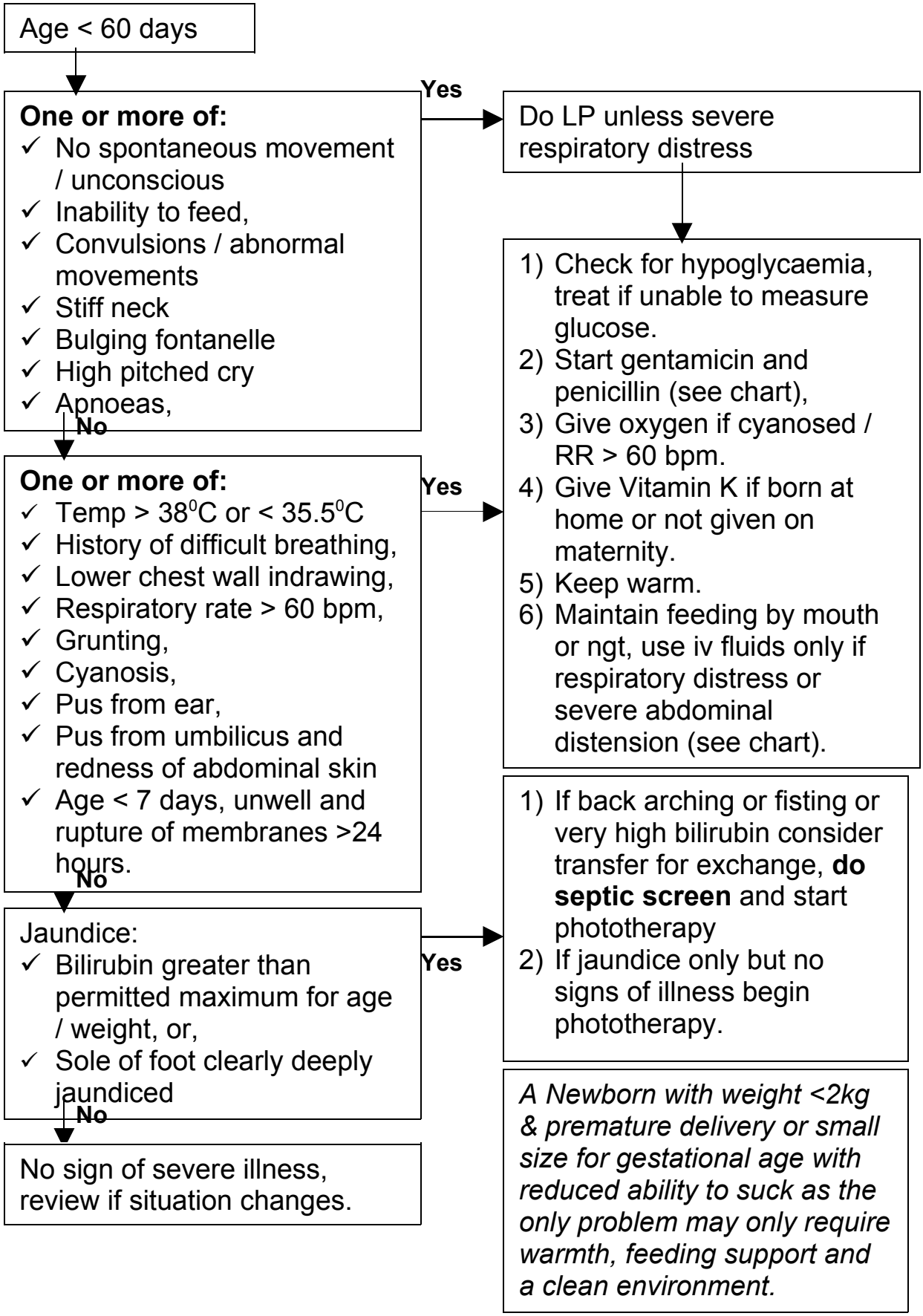
1) If respiratory distress or oedema get worse or the jugular veins are engorged reduce feed volumes.
2) When appetite returns (and oedema much improved) change from F75 to F100, for the first 2 days use the same feed volumes as for F75. Then increase to the minimum F100 volume and continue increasing feeds by 10mls per feed stopping when the child is not finishing the feeds or if the maximum is reached.

	F75 – acute feeding					F100 – catch-up feeding		
	No or moderate oedema		Severe oedema, even face				3 hourly feed volume	
Weight (kg)	Total Feeds / 24 hrs	3 hourly feed volume	Total Feeds / 24 hrs	3 hourly feed volume		Total Feeds / 24 hrs	Min	Max
3.0	390	50	300	40		450	55	80
3.5	455	60	350	45		525	65	95
4.0	520	65	400	50		600	75	110
4.5	585	75	450	60		675	85	120
5.0	650	80	500	65		750	95	135
5.5	715	90	550	70		825	105	150
6.0	780	100	600	75		900	115	165
6.5	845	105	650	85		975	125	175
7.0	910	115	700	90		1050	135	190
7.5	975	120	750	95		1125	140	205
8.0	1040	130	800	100		1200	150	220
8.5	1105	140	850	110		1275	160	230
9.0	1170	145	900	115		1350	170	245
9.5	1235	155	950	120		1425	180	260
10.0	1300	160	1000	125		1500	190	275
10.5	1365	170	1050	135		1575	200	285
11.0	1430	180	1100	140		1650	210	300
11.5	1495	185	1150	145		1725	215	315
12.0	1560	195	1200	150		1800	225	330

Meningitis – investigation and treatment.



Neonatal Sepsis / Prematurity / LBW / Jaundice



Duration of Treatment for Neonatal / Young Infant Sepsis.

Problem	Days of treatment
Signs of Young Infant Infection in a child breast feeding well.	• Antibiotics could be stopped after 48 hours if the child is feeding well without fever and has no other problem **and** LP, if done, is normal. • The child can go home with 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 48 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 <u>further</u> 5 days.
Clinical or radiological pneumonia.	• IV / IM antibiotics should be continued for a minimum of 5 days or until completely well. • For positive LP see below.
Severe Neonatal Sepsis with coma / inability to feed.	• 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.

Growth, Vitamins and Minerals:

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.

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

- 2.5 mls of multivitamin syrup daily once full milk feeding has started (2 wks)
- 2.5mls of ferrous fumarate suspension daily ***starting at 4-6 weeks of age*** for 12 wks***.***

Newborn Feeding / Fluid requirements.	**Age**	**Daily Fluid / Milk Vol.**
✓ Weight >1.75kg, **NO** asphyxia or resp. distress start immediate milk feeding ✓ Weight <1.75kg or >1.75kg **WITH** asphyxia or resp. distress, start with 24 hrs iv dextrose (10%) ✓ Reduce feeds by 20mls/kg/day if severe resp. distress ✓ From Day 2 of life use 2 parts 10% dextrose to 1 part HS Darrow's (eg. 200mls 10% + 100mls HSD). ✓ Introduce EBM at 24 hrs unless there is asphyxia. Begin with 3mls each feed if <1.5kg and 6mls each feed if ≥ 1.5kg. Increase by the same amount every day while reducing iv fluids to keep within the total daily volume until iv fluids have stopped.	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

Nasogastric 3 hourly feed volumes for babies on full volume feeds (*No RDS or asphyxia on Day 1*)

Day 1	14	15	17	18	20	21	23	24	26	27	29	30	
Day 2	18	20	22	24	26	28	30	32	34	36	38	40	
Day 3	23	25	28	30	33	35	38	40	43	45	48	50	
Day 4	27	30	33	36	39	42	45	48	51	54	57	60	
Day 5	32	35	39	42	46	49	53	56	60	63	67	70	
Day 6	36	40	44	48	52	56	60	64	68	72	76	80	
Day 7	41	45	50	54	59	63	68	72	77	81	86	90	

Intravenous fluid rates in mls / hour for sick newborns on FULL volume iv fluids.

Day 1	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	
Day 2	4	5	5	6	7	7	8	9	9	10	11	11	12	13	13	
Day 3	5	6	7	8	8	9	10	11	12	13	13	14	15	16	17	
Day 4	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Day 5	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23	
Day 6	8	9	11	12	13	15	16	17	19	20	21	23	24	25	27	
Day 7	9	11	12	14	15	17	18	20	21	23	24	26	27	29	30	

Intravenous / intramuscular antibiotics aged < 7 days

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

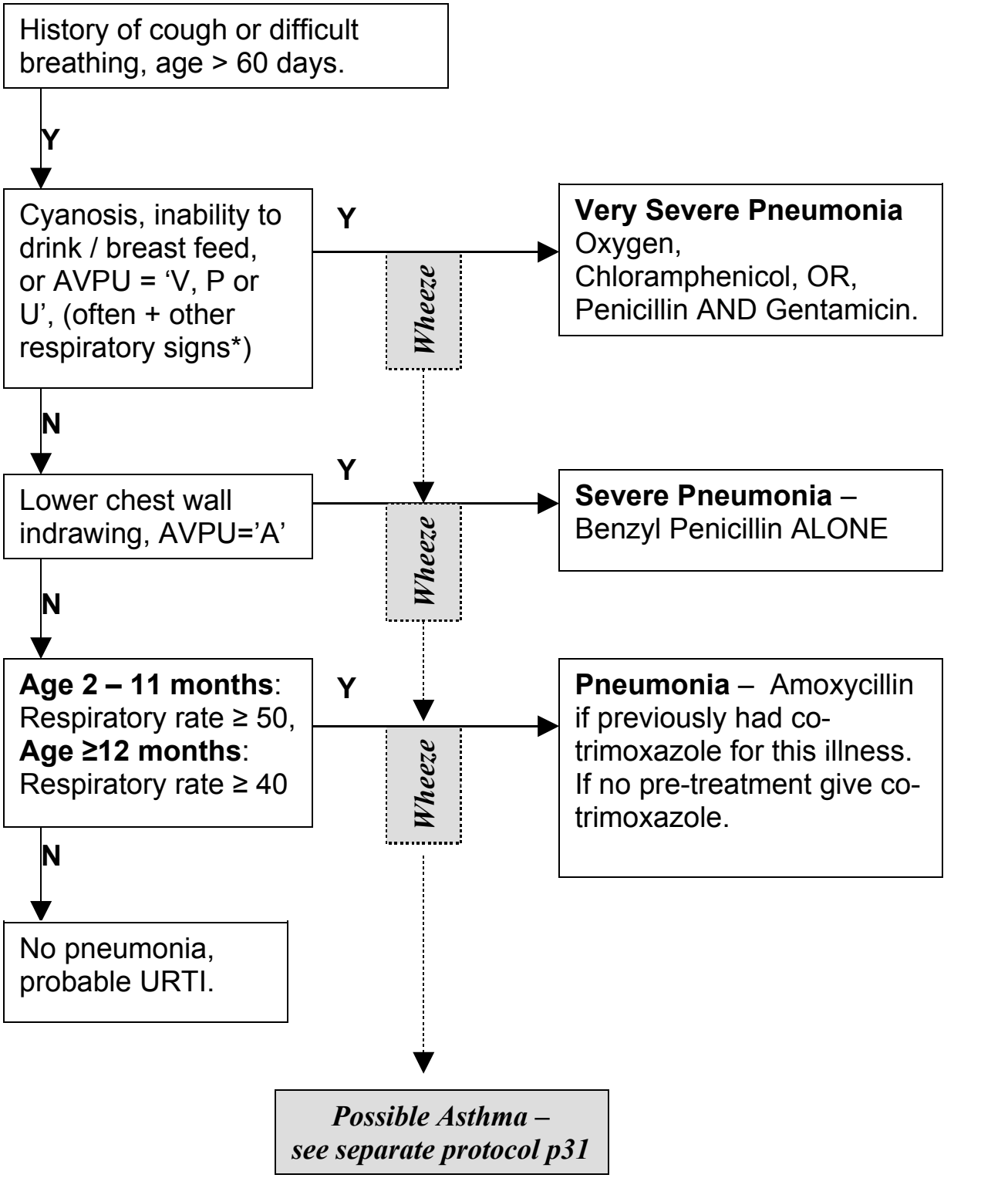
Opthalmia Neonatorum:
Swollen red eyelids with pus should be treated with a single dose of:

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

Warning:

- ✓ Gentamicin used once daily should **be given im or as a slow iv bolus** (push) – over 2-3 minutes.
- ✓ If a baby is not obviously passing urine after more than 48 hours consider stopping gentamicin.
- ✓ Chloramphenicol should not be used in babies aged < 7 days.

ARI / pneumonia protocol for children aged 2 months to 4yrs.



** Additional signs of pneumonia / severe pneumonia: nasal flaring, grunting, indrawing, raised RR*

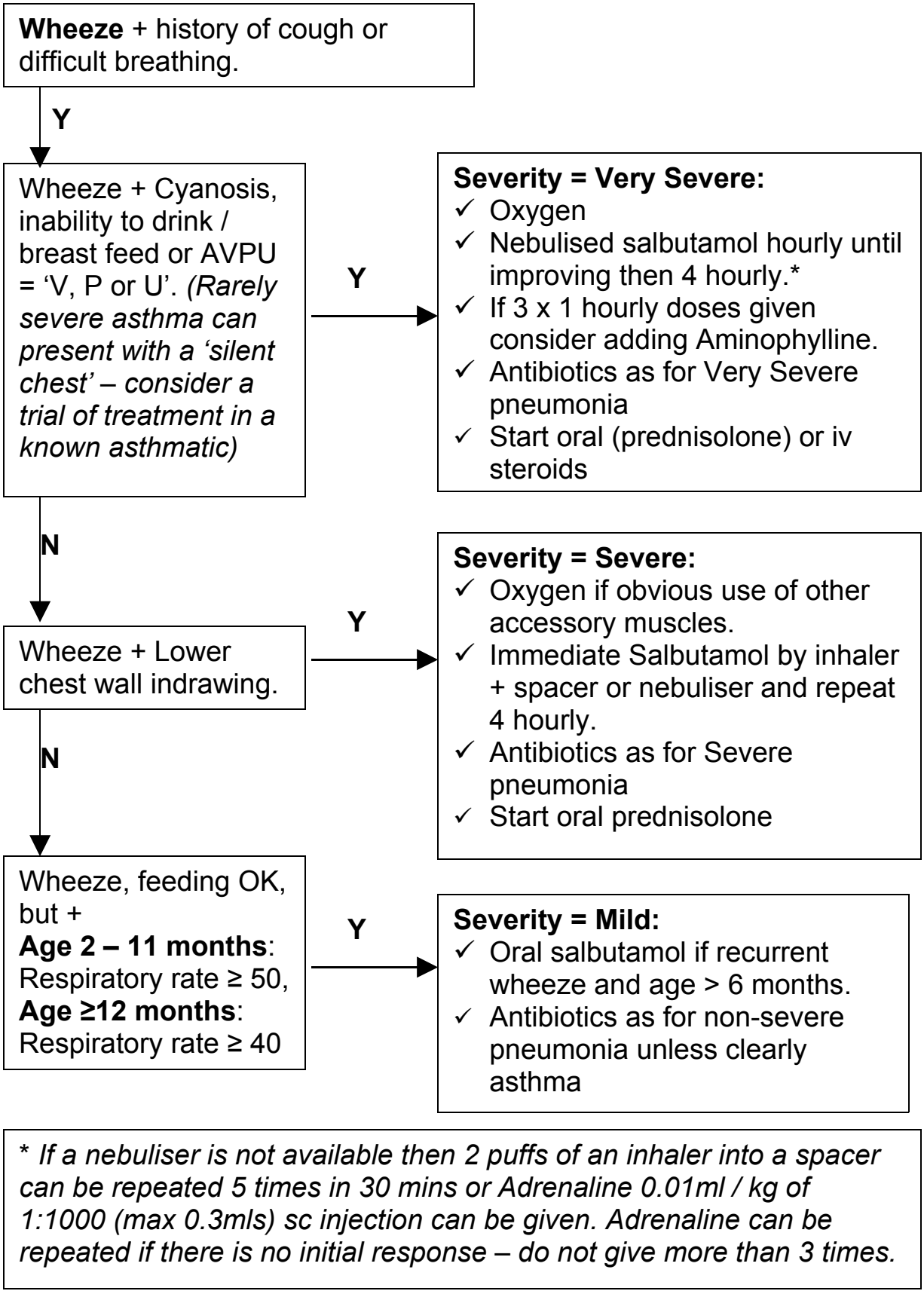
Pneumonia treatment failure definitions.

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

See HIV page for indications for PCP treatment.

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 to: Chloramphenicol or continue Penicillin 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).	Add cloxacillin iv to pen and gent. If on chloramphenicol alone continue for 5 days. 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 to Chloramphenicol or continue Penicillin and **add** gentamicin.
Day 5.	
At least 3 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	a) If only on penicillin change to Chloramphenicol, if already on Chloramphenicol or Penicillin / Gentamicin change to ceftriaxone. b) 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 criteria.

Possible asthma – admission management of the wheezy child.



** If a nebuliser is not available then 2 puffs of an inhaler into a spacer can be repeated 5 times in 30 mins or Adrenaline 0.01ml / kg of 1:1000 (max 0.3mls) sc injection can be given. Adrenaline can be repeated if there is no initial response – do not give more than 3 times.*

Emergency estimation of child's weight from their age.

All babies and children admitted to hospital should be weighed and the weight recorded on the Child Health Card.

Estimate the weight from the age only in emergencies or exceptional circumstances.

As soon as possible check the weight and correct it.

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