Hospital Based Integrated Management of Neonatal and Childhood Illness (IMNCI)

Chart booklet

3rd Edition October 2024

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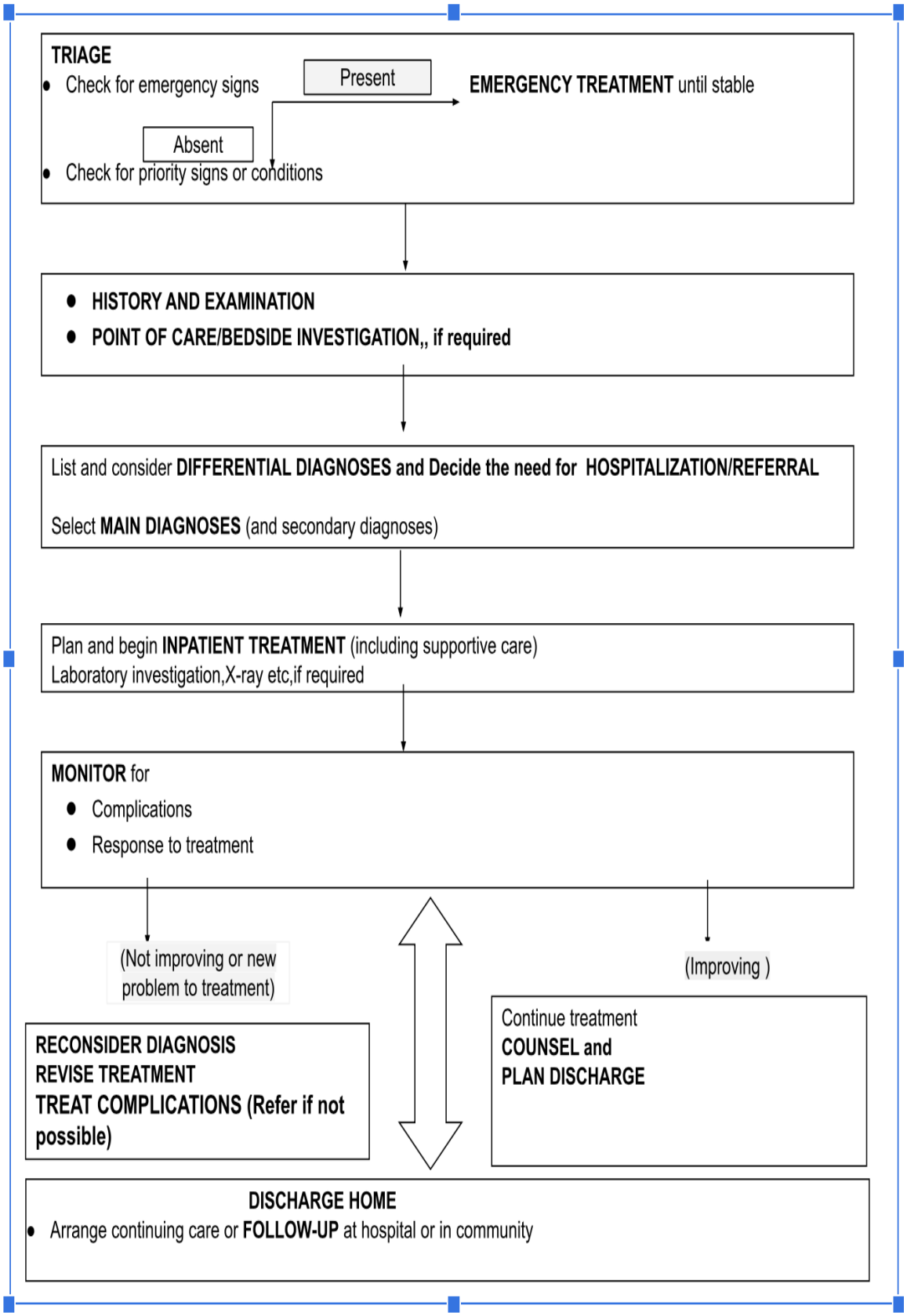
Chart 1: Steps in the management of the sick child admitted to hospital: Summary of key elements



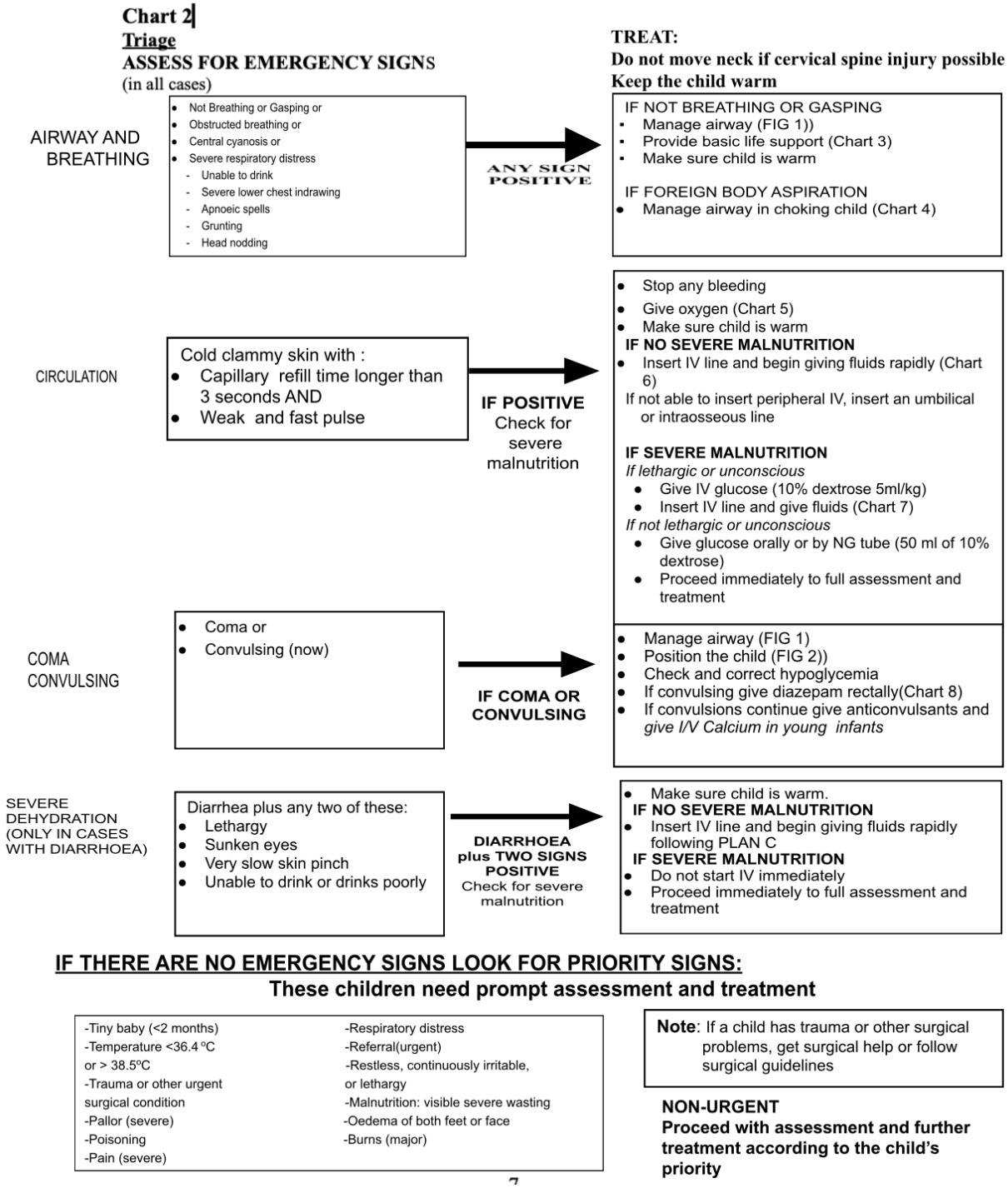


Figure 1: Look, listen and feel for breathing

Figure 1 & 2: How to manage the airway in a child with obstructed breathing (or who has just stopped breathing)

» **No neck trauma is suspected**

Child conscious

Inspect mouth and remove foreign body, if present
Clear secretions from throat
Let child assume position of maximal comfort

Child unconscious

Tilt the head as shown
Inspect mouth and remove foreign body, if present
Clear secretions from throat
Check the airway by looking for chest movements, listening for breath sounds and feeling for breath

Figure 1: Look, listen and feel for breathing

» **Neck trauma suspected (possible cervical spine injury)**

Stablize the neck, as shown in Chart 8
Inspect mouth and remove foreign body, if present
Clear secretions from throat
Check the airway by looking for chest movements, listening for breath sounds, and feeling for breath

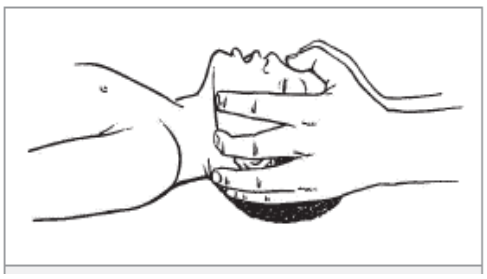


Fig: 2: Using Jaw thrust without head tilt

Chart 3: Pediatric Basic Life Support

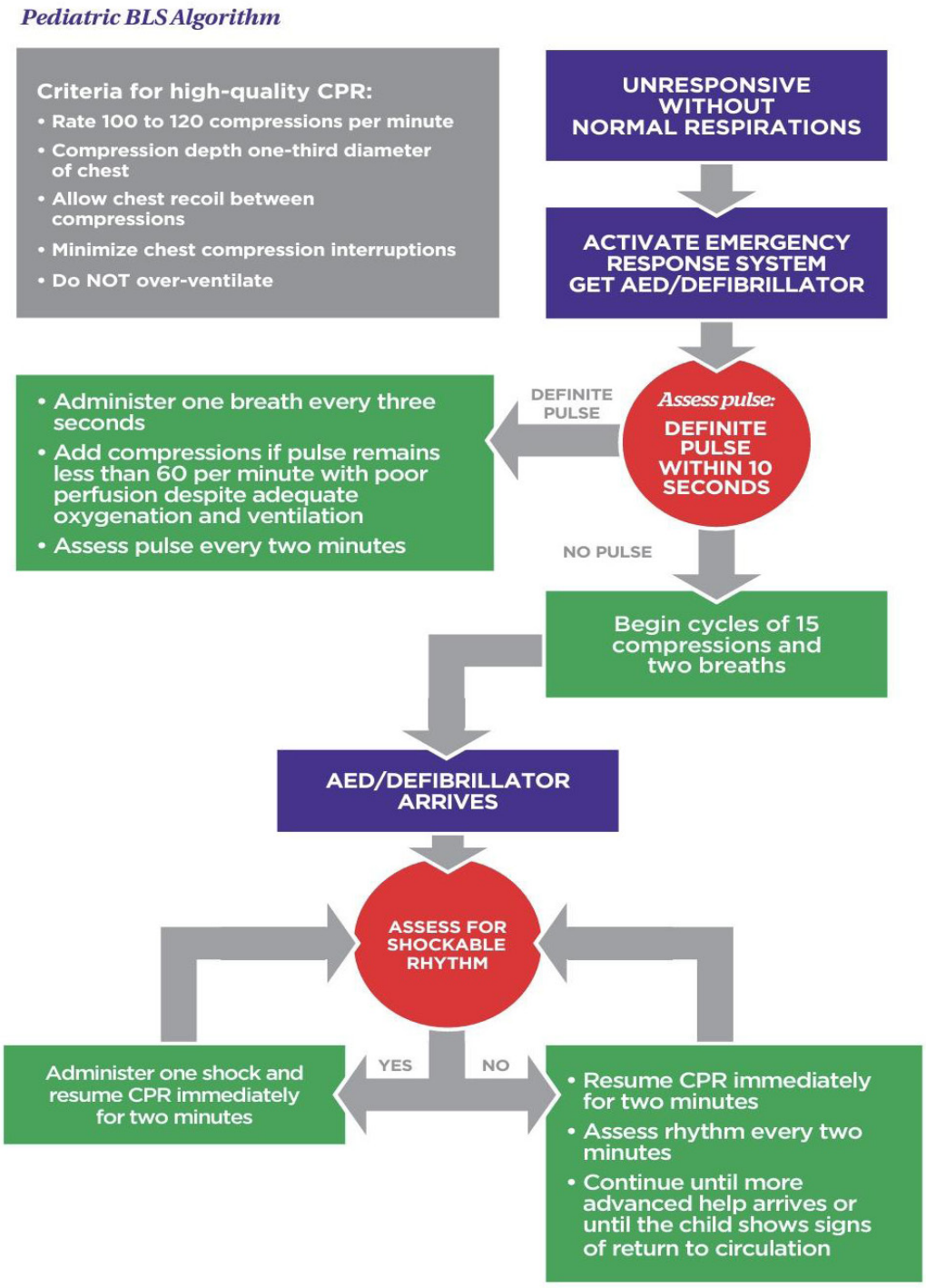
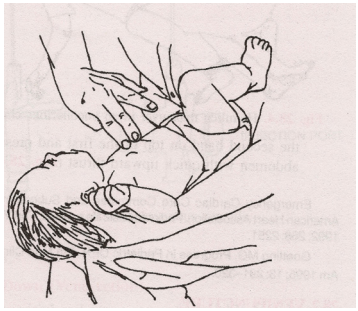


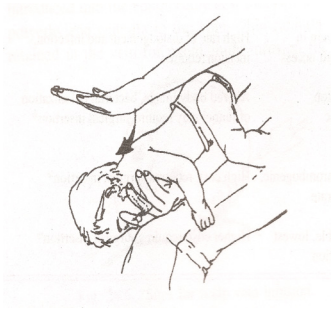
Chart 4: How to manage the airway in a choking child (foreign body aspiration with increasing respiratory distress)

» **Infants**

- Lay the infant on your arm or thigh in a head down position and support the head by firmly holding the jaw.
- Give 5 blows to the infant's back with heel of hand between the shoulder blades.
- If obstruction persists, turn infant over and give 5 chest thrusts with 2 fingers, one finger breadth below nipple level in midline.
- If obstruction persists, check infant's mouth for any obstruction which can be removed.
- If necessary, repeat sequence until the object is expelled.



Chest thrust



Back slaps

» **Children**

- The child may be sitting or standing.
- Stand or kneel behind the child and encircle his torso by putting both arms directly under axillae.
- Place the thumb side of one fist against the victim's abdomen in the midline slightly above the navel and well below the tip of the xiphoid process.
- Place the other hand over the fist and pull upwards into the abdomen, repeat this Heimlich maneuver 5 times.
- If the obstruction persists, check the child's mouth for any obstruction which can be removed.
- If necessary, repeat this sequence.

Heimlich manoeuvre in a choking older child

Chart 5: Oxygen therapy to a child with respiratory distress

Indications for oxygen therapy are the following:

- have central cyanosis, or
- severe lower chest wall indrawing
- respiratory rate of 70/min or above
- apnoeic spells
- grunting with every breath (in young infants)
- head nodding.

Give oxygen:

- **Nasal Prongs**

  Place them just inside the nostrils and secure with a piece of tape on the cheeks near the nose and take care that the nostrils are kept clear of mucus, which could block the flow of oxygen.

  It is the preferred method for delivering oxygen to pre-terms and low birth weight infants, with a flow rate of 0.5- 1 L/min , increased to 2L/min in severe respiratory distress.

Start oxygen flow at 0.5 - 1L/min ; can be increased to 2L / minute

- **Head Box**
  - Place a head box over the baby's head.
  - Ensure that the baby's head stays within the head box, even when the baby moves.
  - Adjust the flow of oxygen to achieve the desired concentration.
  - If the baby's breathing difficulty worsens or the baby has central cyanosis, give oxygen at a high flow rate.

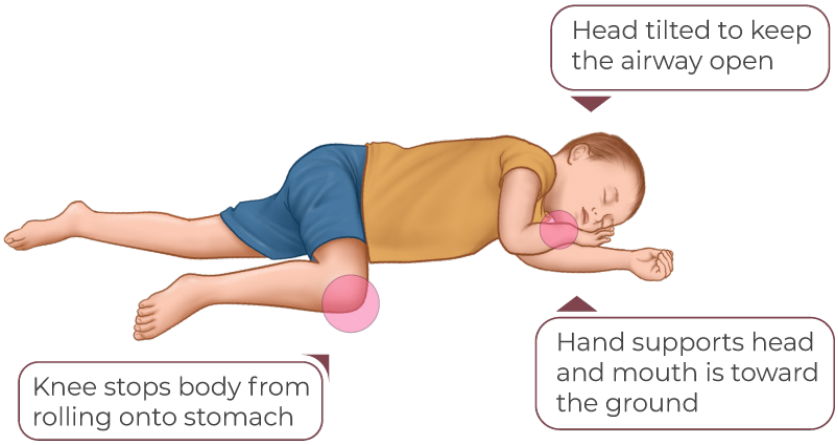
Start oxygen flow at 3-5 liters / minute

Pulse oximetry: Maintain a saturation of 88 – 92% in preterm and 92 -96% in term neonates

Figure 7: Recovery Position of unconscious child

» **If neck trauma is not suspected :**

- Turn the child on the side to reduce risk of aspiration
- Keep the neck slightly extended and stabilize by placing cheek on one hand
- Bend one leg to stabilize the body position

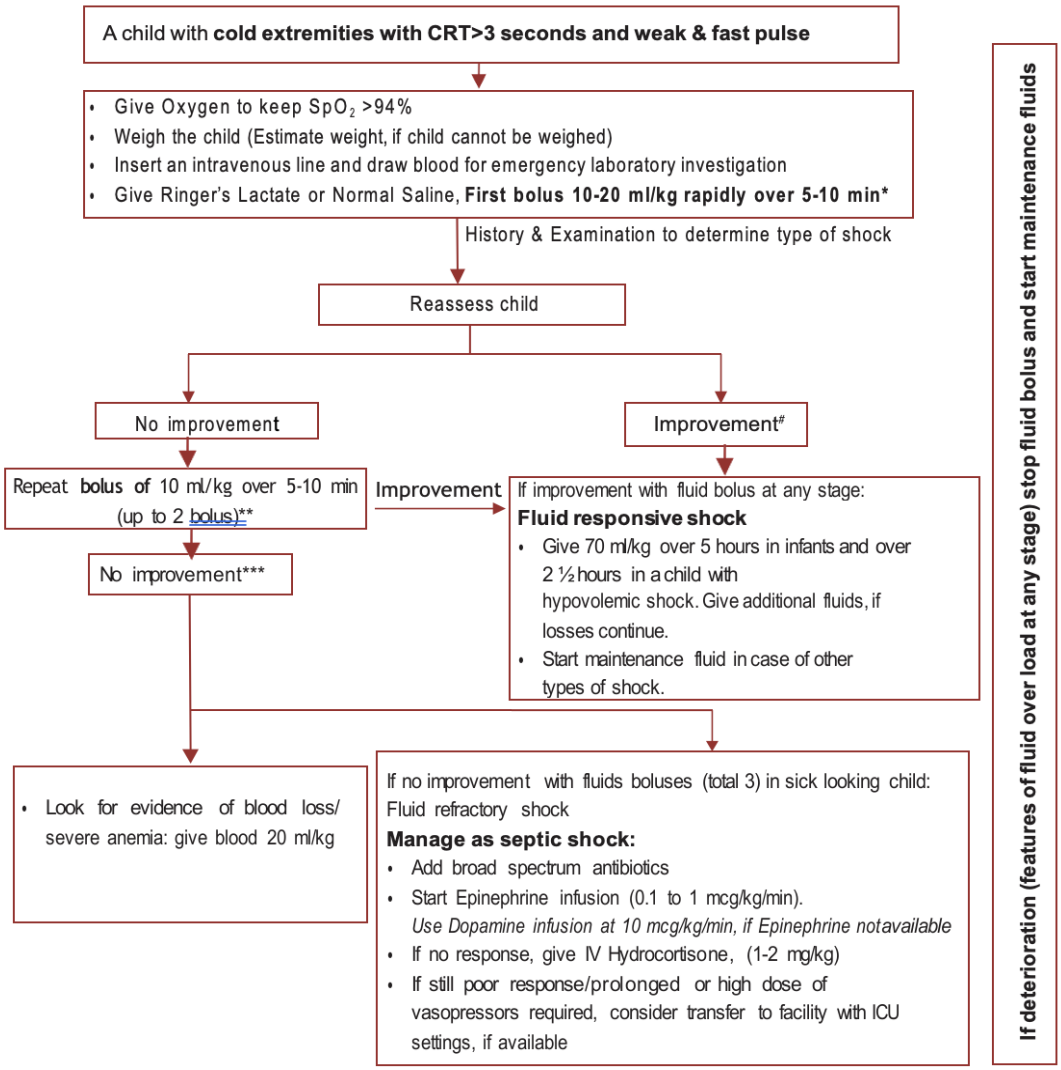


» **If neck trauma is suspected :**

- Stabilize the child's neck and keep the child lying on the back
- Tape the child's forehead to the sides of a firm board to secure this position
- Prevent the neck from moving by supporting the child's head (e.g. using litre bags of IV fluid on each side)
- If vomiting, turn on the side, keeping the head in line with the body.

Figure 8: Stabilizing the neck of trauma patient with sandbags/rolled towels

Chart 6: How to give IV Fluid for shock in a child without severe acute malnutrition



**Give 20 ml/kg IV fluids fast over 5-10 minutes in hypovolemic shock, slow over 60 min if the child has moderate malnutrition or severe pallor or fever*

***Give 20 ml /kg IV fluid bolus in case of hypovolemic shock*

#Signs of improvement: Good volume and slowing pulse rate and faster capillary refill.

****If deterioration (increase in RR > 5 and HR > 15) stop fluid, consider cardiogenic or septic shock.*

Chart 7: How to give IV Fluid for shock in a child with severe acute malnutrition

Chart 7: How to give IV fluids for shock in a child with Severe Acute Malnutrition (SAM)

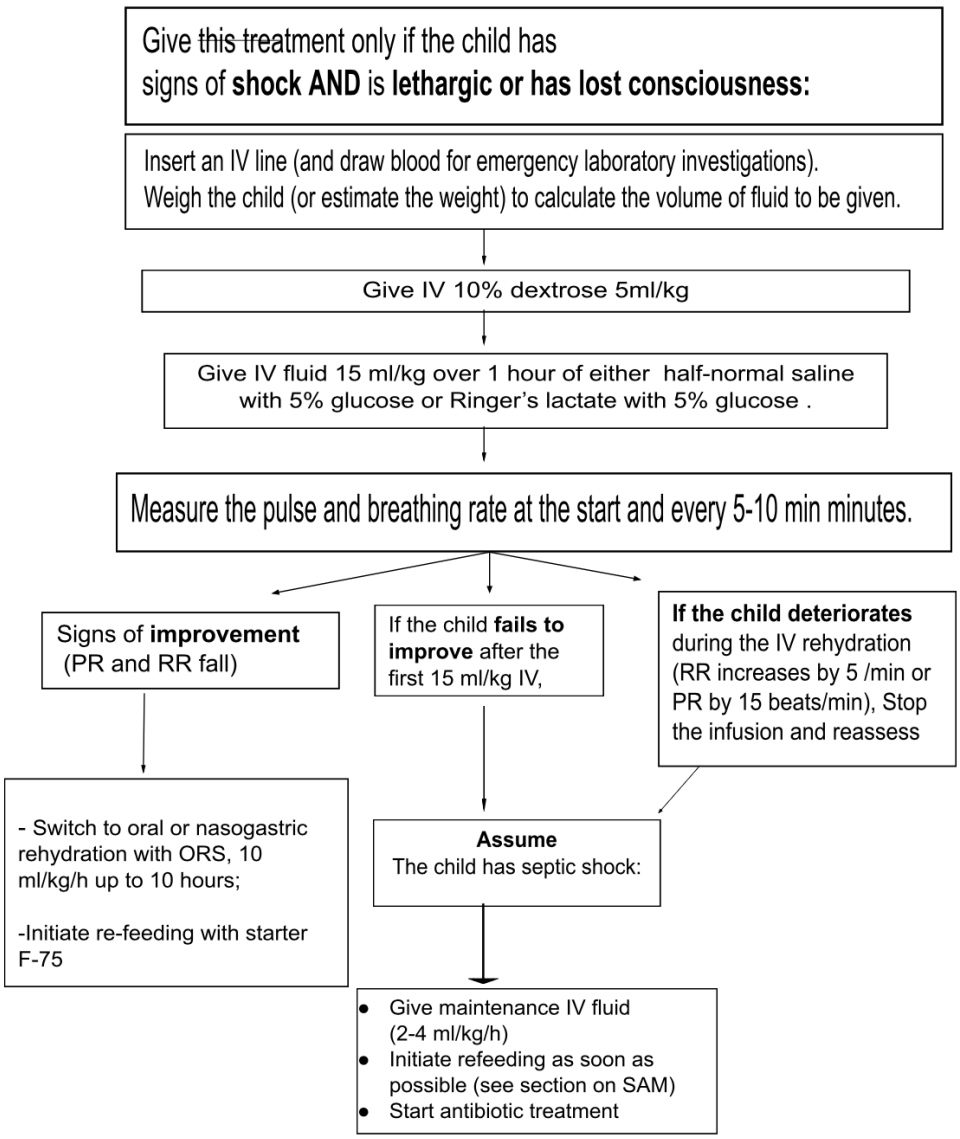


Chart 8: How to Manage convulsions

Neonates (up to 4 weeks)

- Identify and characterize the seizure
- Secure airway and optimize breathing, circulation and temperature
- Start O_2 if seizures continue
- Secure IV access and take samples for baseline investigations including blood sugar, sepsis screen and calcium, magnesium, electrolytes where feasible
- If blood sugar < 45 mg/dl, give 2 – 4 ml/kg 10% dextrose
- If hypocalcaemic, administer 2 ml/kg of 10 % calcium gluconate as slow IV infusion and continue with oral supplementation.
- If seizures continue: IV phenobarbitone 15 -20 mg/kg over 20 min
- If no control: Repeat phenobarbitone 5 - 10 mg/kg till a total of 40 mg/kg
- If seizures continue, give phenytoin 20 mg/kg over 20 min
- After control of seizures, put the neonate on maintenance dose of phenobarbitone (oral/ IV) at 3 to 5 mg /kg/day in 1-2 divided doses

Beyond neonatal period:

- Acute seizures should be controlled with intravenous Diazepam at 0.25 mg/kg (Max dose : 5 mg for children under 5 years old and 10 mg for those over 5 years old. When IV access is difficult/ not possible, diazepam can be administered per rectally at 0.5 mg/kg .
- Draw up the required dose (based on the weight wherever possible) from an ampoule of diazepam into a tuberculin (1 ml) syringe. Then remove the needle.
- Insert the syringe into the rectum 4 to 5 cm and inject the diazepam solution.
- Hold the buttocks together for a few minutes.

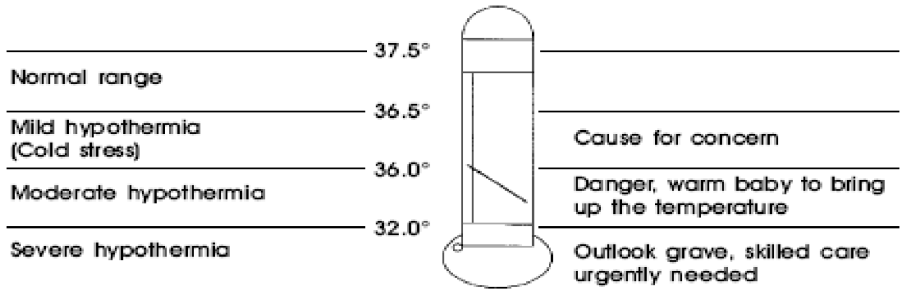
	Intravenous diazepam 10 mg/2 ml	Diazepam given rectally 10 mg / 2 ml solution
Age / weight	**0.05ml/kg**	**Dose 0.1 ml/kg**
1 to 2 months (<4 kg)	0.15ml	0.3 ml
2 to <4 months (4 to <6 kg)	0.25ml	0.5 ml
4 to <12 months (6 to <10 kg)	0.5ml	1.0 ml
1 to <3 years (10 to <14 kg)	0.6ml	1.25 ml
3 to <5 years (14 to 19 kg)	0.75ml	1.5 ml

- If convulsion continues, give a second dose of diazepam IV or rectally
- If convulsion continues, IV phenytoin should be administered at a dose of 15-20 mg/kg diluted in approximately 20 ml of saline (avoiding dextrose-containing solutions), infused slowly over 20 minutes. If IV access is not possible IO route can be used.
- Alternatively, phenobarbital can be given at a dose of 15-20 mg/kg IV, diluted in 20 ml of 5% dextrose or saline, infused over 20 minutes.
- Maintenance dose of phenobarbitone in infants is 5 to 6 mg/ kg in 1-2 divided doses and in older Children (1 to 5 years): 6 to 8 mg/kg in 1 to 2 divided doses.

Caution
Do not use Diazepam for control of convulsions in Neonates

Continue Supportive Care and Treat Underlying Cause e.g. Meningitis

Chart 9: Management of hypothermia in a young infant



- » If a baby has a temperature of less than 36.5 C the baby has 'hypothermia'. Confirm the diagnosis of hypothermia by recording actual body temperature
- » Skin-to-Skin contact is the best way to keep a baby warm and the best way to 're-warm' a baby who has mild hypothermia (36.0°-36.5° C) and is found to have cold feet

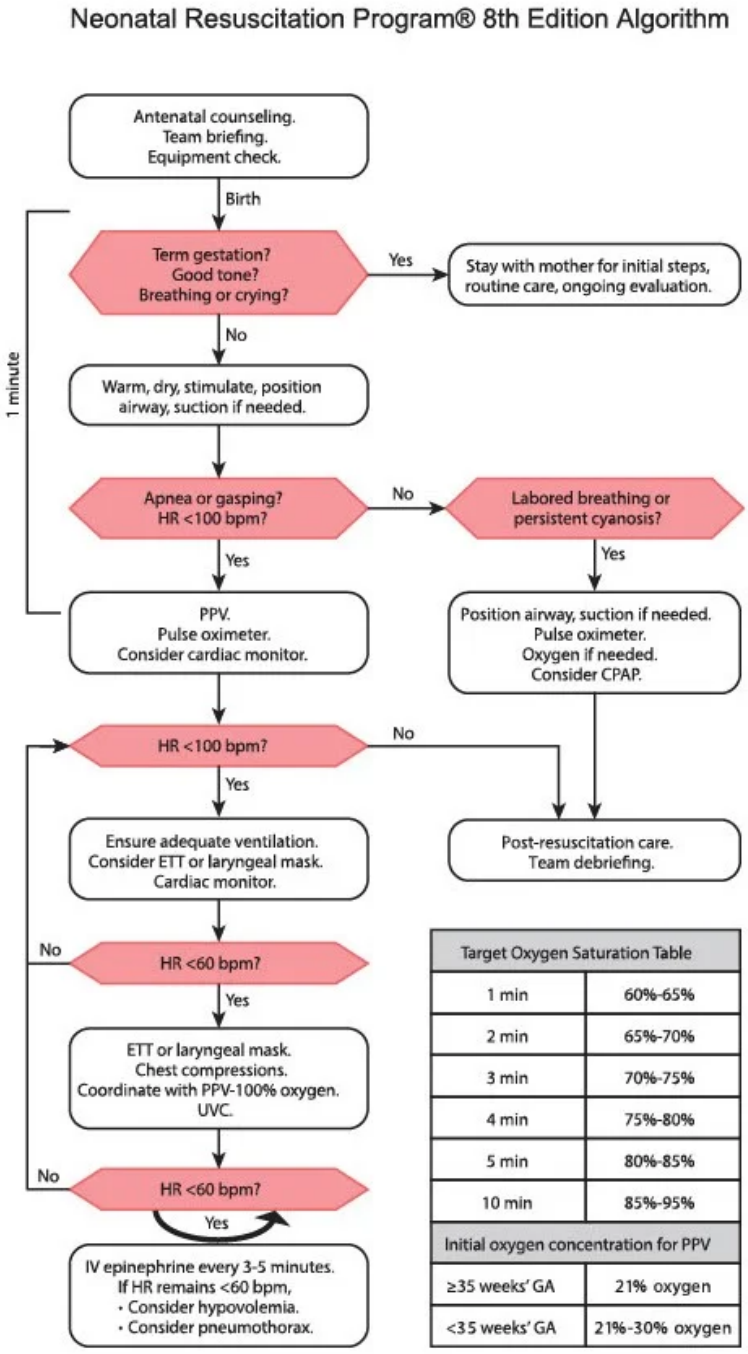
Moderate hypothermia (>32°C to ≤ 36°C)

- » Warm the young infant using Skin to Skin contact by the mother or by the father or any other adult.
- » Ensure that the temperature of the room where the rewarming takes place is at least 25°C.
- » If Skin to Skin contact is not possible, radiant warmer may be used if available.
- » Encourage the mother to breastfeed more frequently.
- » Check blood glucose and treat if hypoglycemia is detected.
- » If the baby's temperature is not up to 36.5°C or more after 2 hours of' rewarming',
- » reassess the baby for other problems.

Severe hypothermia (<32°C)

- » Warm immediately using a pre-warmed radiant warmer .
- » Remove cold or wet clothing. Dress in warm clothes and a cap, and cover with a warm blanket.
- » Check and treat for hypoglycemia .
- » Treat for sepsis.
- » Start IV fluids and provide oxygen if indicated
- » Monitor the temperature of the baby every ½ hour.

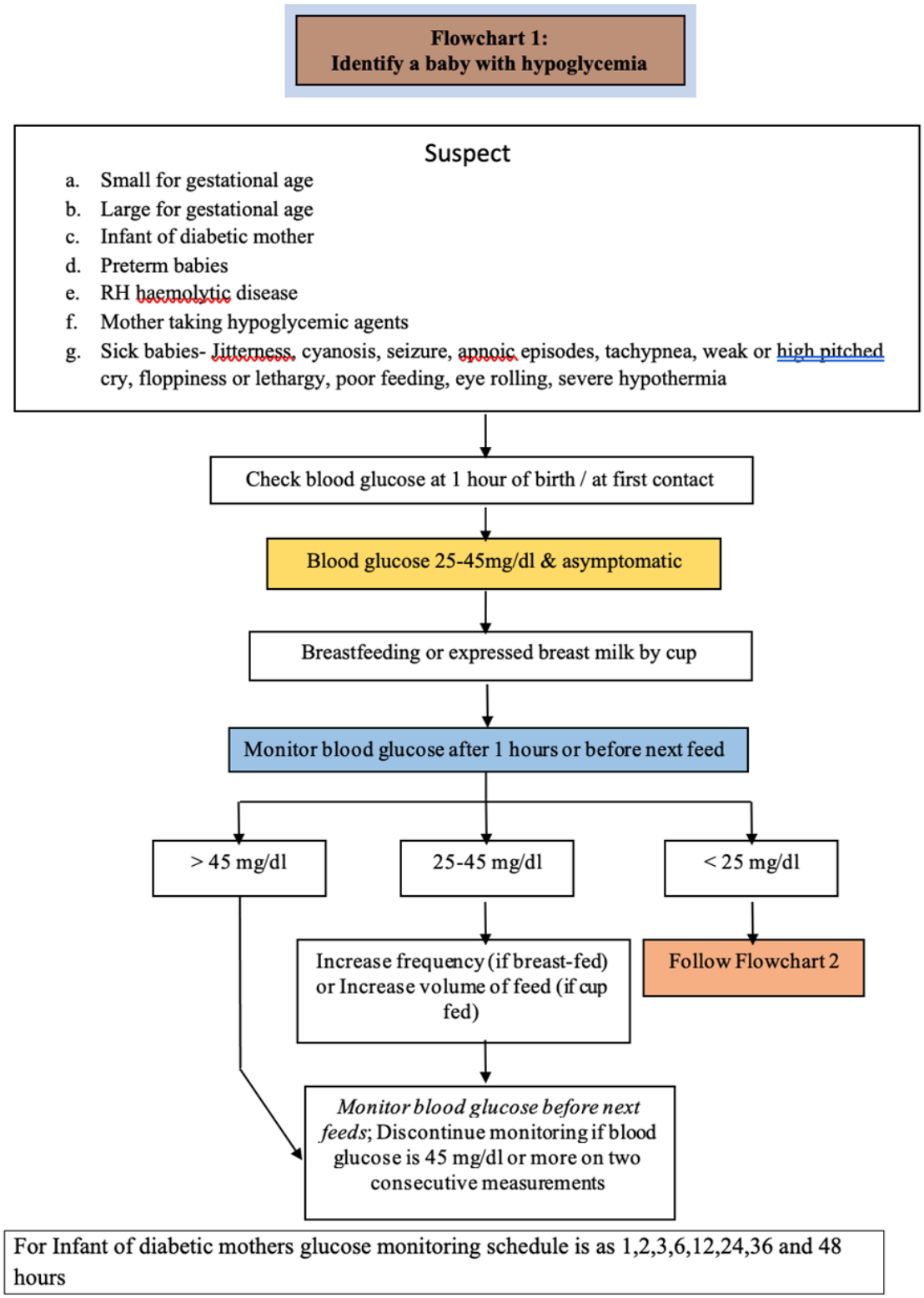
Chart 10: Neonatal Resuscitation



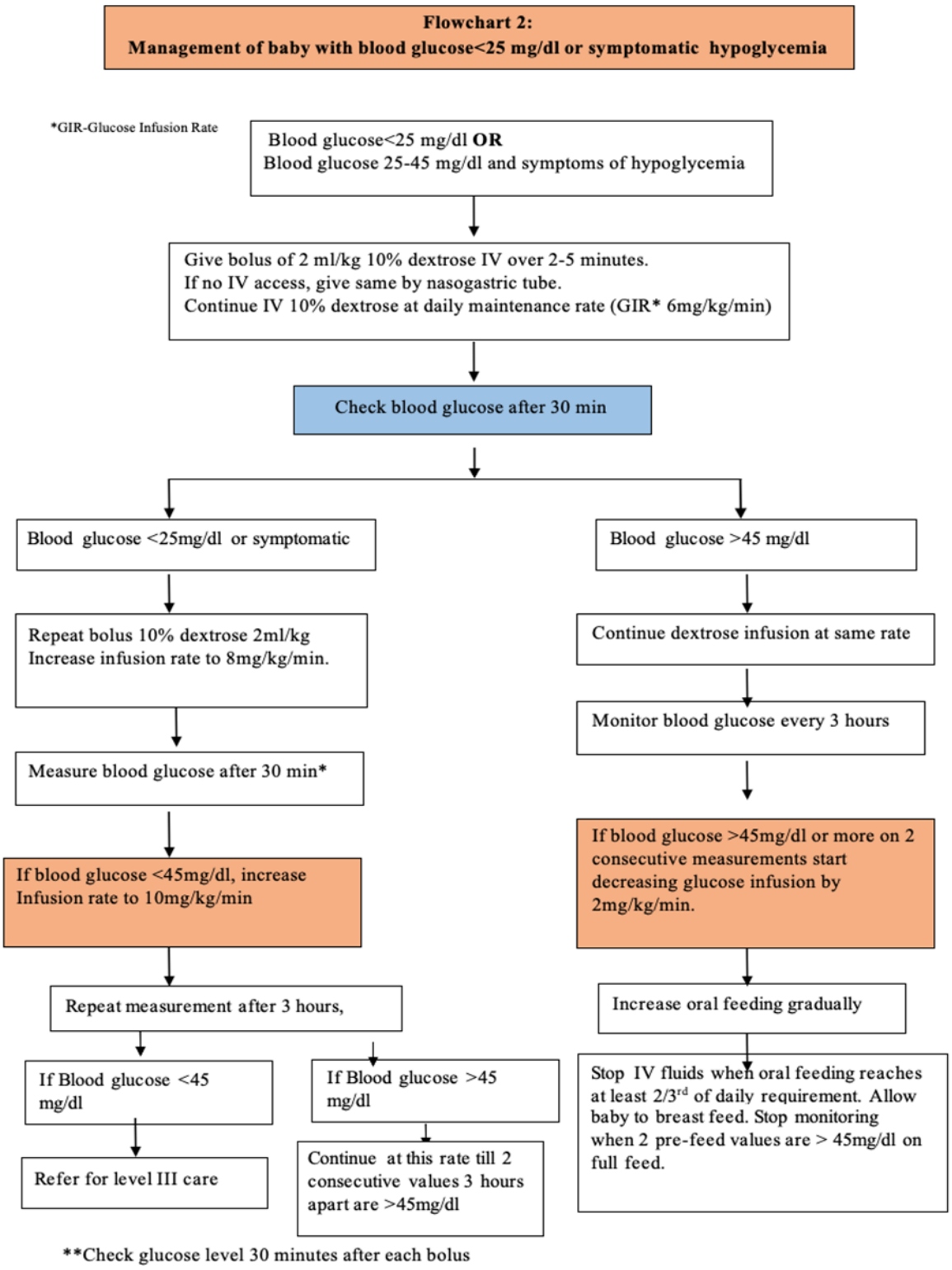
Target Oxygen Saturation Table	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%
Initial oxygen concentration for PPV	
≥35 weeks' GA	21% oxygen
<35 weeks' GA	21%-30% oxygen

Chart 11: Management of Neonatal hypoglycemia:

(Management of hypoglycemia should follow the following treatment algorithms ; flowchart 1 & 2)



(Courtesy: Facility Based Integrated Management of Neonatal and Childhood Illness (FB-IMNCI)- Nepal, 2019)



(Courtesy: Facility Based Integrated Management of Neonatal and Childhood Illness (FB-IMNCI)- Nepal, 2019)

» Insert IV line and draw blood rapidly for emergency laboratory investigations

» Check blood glucose, if low [<2.5 mmol/litre (45 mg/dl) in well nourished or <3 mmol/litre (54 mg/dl) in a severely malnourished child] or if dextrostix is not available :

» Give 2-5 ml/kg of 10% glucose solution rapidly by IV injection.

Achieving appropriate glucose infusion rates using a mixture of D10 & D25							
Day	Volume (ml/kg/d)	Glucose infusion rate					
		6mg/kg/min		8mg/kg/min		10mg/kg/min	
		D10 (ml/kg/d)	D25 (ml/kg/d)	D10 (ml/kg/d)	D25 (ml/kg/d)	D10 (ml/kg/d)	D25 (ml/kg/d)
1	60	42	18	24	36	5	55
2	80	76	4	57	23	37	43
3	100	85*		90	10	71	29
4	120	100*	0	120	0	104	16
5	140	120*				137	3

*Add 20ml/kg normal saline to give 3mEq/kg Na

Neonatal Hypoglycemia:

» Start infusion of glucose at the daily maintenance volume according to the baby's age so as to provide 6 mg/kg/min of glucose in all cases of neonatal hypoglycemia

» **Recheck the blood glucose in 30 minutes. If it is still low,** repeat the bolus of glucose (above) and increase concentration of glucose to 8 mg/kg/min in the infusion. **Do not discontinue the glucose infusion abruptly to prevent rebound hypoglycemia.**

If hypoglycemia is persisting despite above management, give one dose of Hydrocortisone: 5 mg/kg and refer to a higher health facility for management of refractory / persistent hypoglycemia.

Hypoglycemia beyond neonatal period:

» Recheck the blood glucose in 30 minutes. If it is still low, repeat 5 ml/kg of 10% glucose solution.

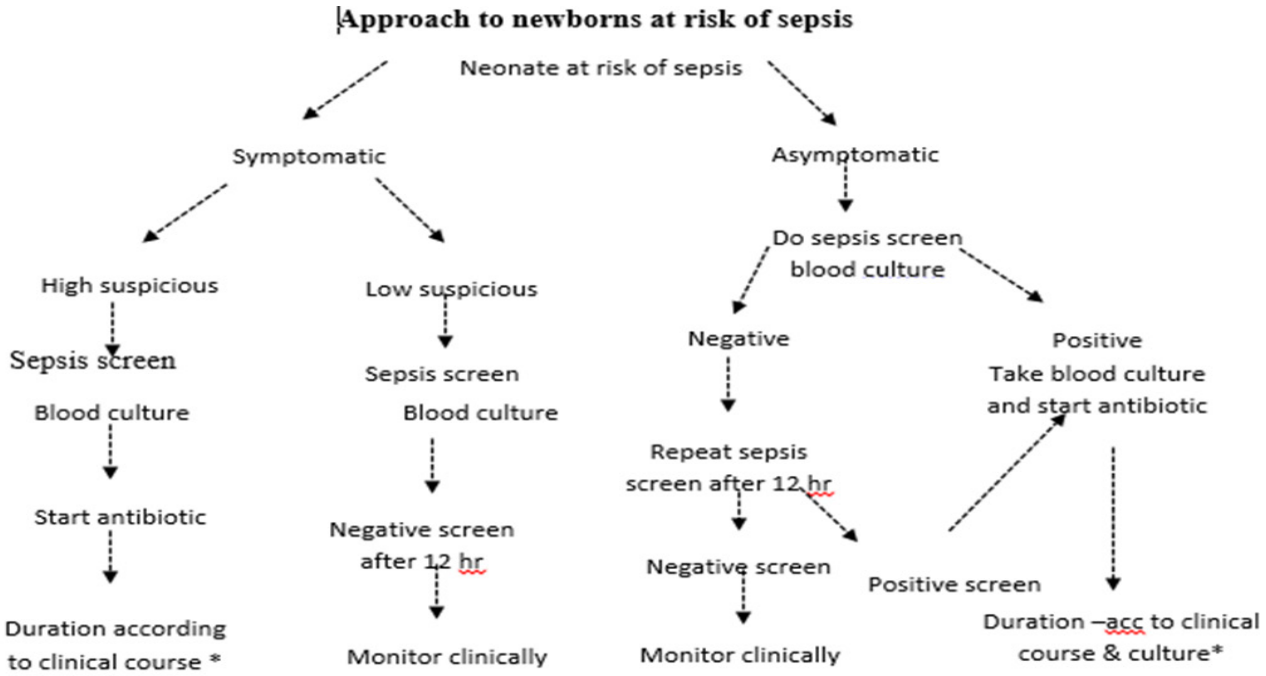
» Feed the child as soon as conscious.

If not able to feed without danger of aspiration, give:

- IV fluids containing 5-10% glucose (dextrose), or
- Milk or sugar solution via nasogastric tube.

To make sugar solution, dissolve 4 level teaspoons of sugar (20 grams) in a 200 ml cup of clean water.

Chart 12 : Approach to neonate at risk for neonatal sepsis



Culture sterile – 7-10 days Culture Positive – 10-14 days * Do lumber puncture if meningitis suspected clinically; if positive then treat for 21 days

Chart 13: Management of Sick young infants (Tiny Baby)

Indications for Admission
Signs and symptoms
Fever or hypothermia
Unable to breastfeed
Respiratory distress (Respiratory rate 60/min or more or severe chest indrawing or grunting)
diarrhea, vomiting, abdominal distention, blood in stool
Bulging anterior fontanelle
Yellow palms and soles
General principles of management
Make sure the baby is warm.
Give oxygen by nasal prongs or nasal catheter if the young infant is cyanosed or in severe respiratory distress.
Bag and mask ventilation if indicated.
Secure IV access and start IVF
Give Phenobarbitone if convulsing.
Check blood glucose.
Give ampicillin and gentamicin.
Give vitamin K (if not given before).
Admit, or refer urgently if treatment is not available at your hospital
Monitor the baby frequently.

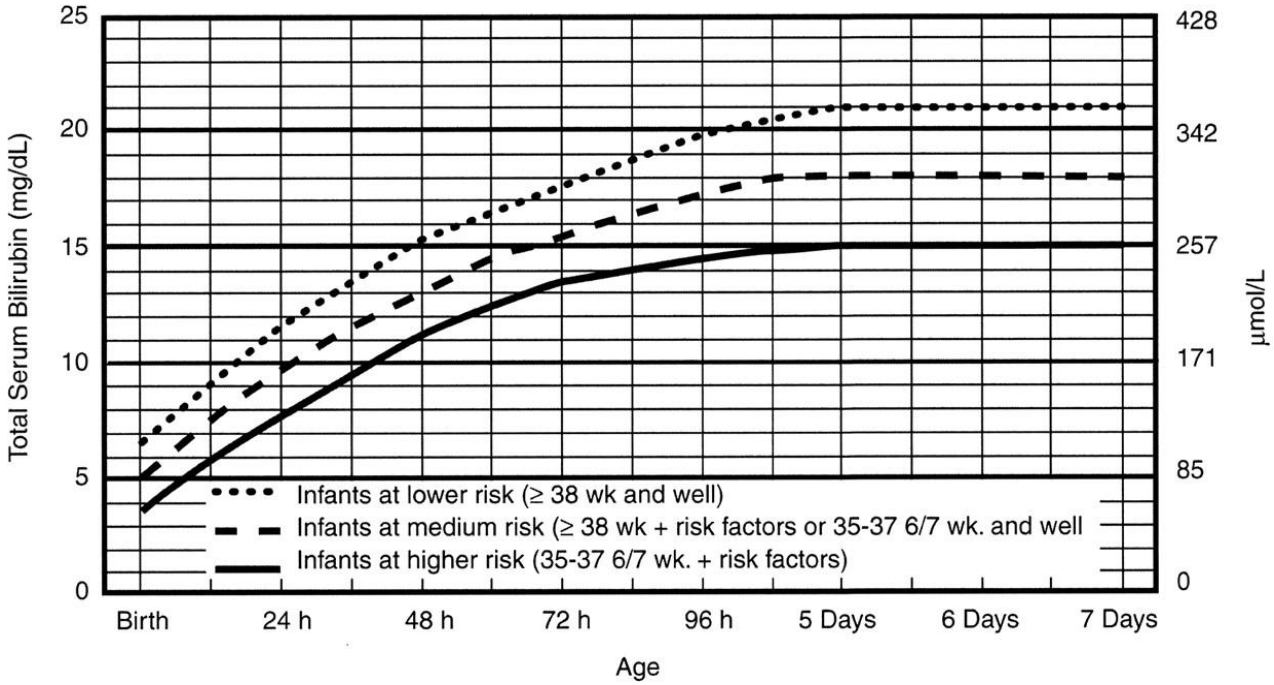
Empirical choice of antibiotics and duration in neonatal sepsis (excluding meningitis)

Category	Antibiotic	Each Dose (mg/kg/dose)	Frequency		Route	Duration (Days)
			< 7 days of age	>7 days of age		
1. EOS (First line) 2. LOS (community acquired)	Inj. Ampicillin	50	12 hourly	8 hourly	IV, IM	7-10
	Inj Cloxacillin should be considered if there is evidence of staphylococcal infection (skin pustules, omphalitis)					
	Inj. Cloxacillin	50	12 hourly	8 hourly	IV	7-10
	AND Inj.Gentamicin	4 (5- 7.5 for > 1 month of age)	24 hourly	24 hourly	IV, IM	7-10
1.EOS (Second line) 2.LOS (HAI)	Inj.Cefotaxime	50	12 hourly	8 hourly	IV, IM	7-10
	OR Inj Ciprofloxacillin	10	12 hourly	12 hourly	IV	7-10
	AND Inj. Amikacin	15	24 hourly	24 hourly	IV, IM	7-10
The duration of antibiotic therapy is 10- 14 days if blood culture is positive (wherever available)						

Empirical choices of antibiotic and duration neonatal meningitis

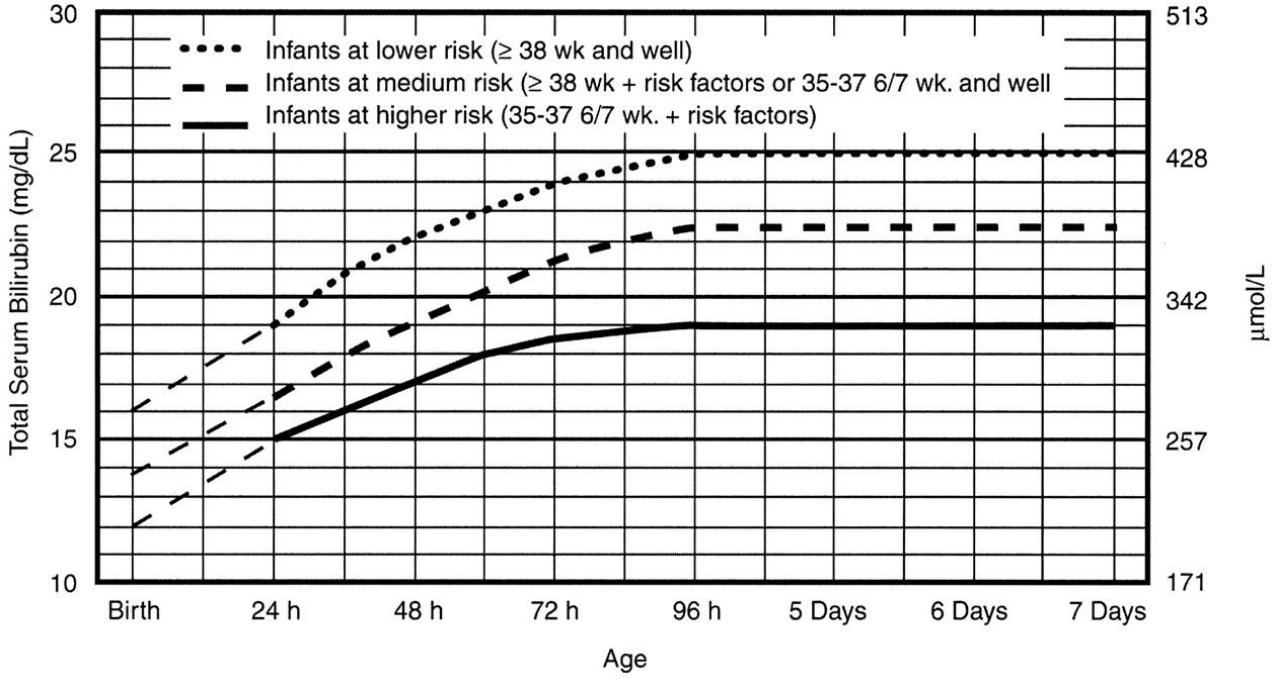
	Antibiotic	Each Dose (mg/kg/dose)	Frequency		Route	Duration (Days)
			<7 days of life	>7 days of life		
First line	Inj. Ampicillin	200 mg/kg/day	12 hourly	8 hourly	IV	21 days
	AND Inj. Gentamicin	4 (5- 7.5 for > 1 month of age)	24 hourly	24 hourly	IV	21 days
Second line	Inj Cefotaxime	200 mg/kg/day	12 hourly	6 hourly	IV	21 days
	AND Inj. Amikacin	15	24 hourly	24 hourly	IV	21 days

Chart 14: Guidelines for initiating Phototherapy in Neonatal Hyperbilirubinemia



- Use total bilirubin. Do not subtract direct reacting or conjugated bilirubin.
- Risk factors = isoimmune hemolytic disease, G6PD deficiency, asphyxia, significant lethargy, temperature instability, sepsis, acidosis, or albumin < 3.0g/dL (if measured)
- For well infants 35-37 6/7 wk can adjust TSB levels for intervention around the medium risk line. It is an option to intervene at lower TSB levels for infants closer to 35 wks and at higher TSB levels for those closer to 37 6/7 wk.
- It is an option to provide conventional phototherapy in hospital or at home at TSB levels 2-3 mg/dL (35-50mmol/L) below those shown but home phototherapy should not be used in any infant with risk factors.

Chart 15: Guidelines for Exchange Transfusion in Neonatal Hyperbilirubinemia



- The dashed lines for the first 24 hours indicate uncertainty due to a wide range of clinical circumstances and a range of responses to phototherapy.
- Immediate exchange transfusion is recommended if infant shows signs of acute bilirubin encephalopathy (hypertonia, arching, retrocollis, opisthotonos, fever, high pitched cry) or if TSB is ≥5 mg/dL (85 µmol/L) above these lines.
- Risk factors - isoimmune hemolytic disease, G6PD deficiency, asphyxia, significant lethargy, temperature instability, sepsis, acidosis.
- Measure serum albumin and calculate B/A ratio (See legend)
- Use total bilirubin. Do not subtract direct reacting or conjugated bilirubin
- If infant is well and 35-37 6/7 wk (median risk) can individualize TSB levels for exchange based on actual gestational age.

Chart 16: Checklist monitoring sick young infant

Sl. no	Checklist	Assessment	Action
1	Temperature	Mild hypothermia	Rewarm by KMC
		Moderate/severe hypothermia	Rapid rewarming by radiant warmer
		Fever	Removal of excess clothing,change environment, sepsis screen
2	Airway	Obstruction	Open airway (nasal lavage,position and suction
3	Breathing	Apnea/Gasping	PPV with bag and mask
		Respiratory distress	Oxygen
4	Circulation	Cold to touch and prolonged CRT with fast pulse > 180/min	Give 10-20 ml/kg NS/RL in 5-10mins
5	Fluids	Intake/output chart	Maintenance fluid
6	Medication	Suspected sepsis	Antibiotics
7	Feeding	amount, duration, frequency	As per feeding guideline
8	Monitor	Temperature, Respiration, Colour, Heart rate, CRT, Danger signs	Manage as per the findings

Sl. no	Checklist	Assessment	Action
9	Communication	understanding of illness,the current condition of the baby,any other concerns of the parents.	**For home care:** » exclusive breastfeeding » maintain temperature » cord & eye care » danger signs » maternal health **Care during transfer:** » inform parents about the need for a referral and the place. » communicate with a higher health center. » maintain ABC and ensure warmth. » ensure patency of peripheral line and appropriate administration of IV fluids. » monitor vitals. » document the findings, events and care provided during the transfer. » Mother to accompany as far as possible
10	Follow up	any new concerns, physical examination	» check if the young infant is on any medication (whether short term/long term and ensure that parents are giving the medications as advised. » ensure that they attend the routine growth monitoring and C4CD plus and developmental delays » advise on immunization, complementary feeding

(Mnemonic for monitoring: T.A.B.C.F.M.F.M.C.F.)

Chart 17: Guidelines for feeding and fluid requirement in small newborn babies

1. Guidelines for total fluid requirements for LBW > 1500 grams

» First day 60-80 ml/kg/day

» Daily increment 20 ml/kg/day

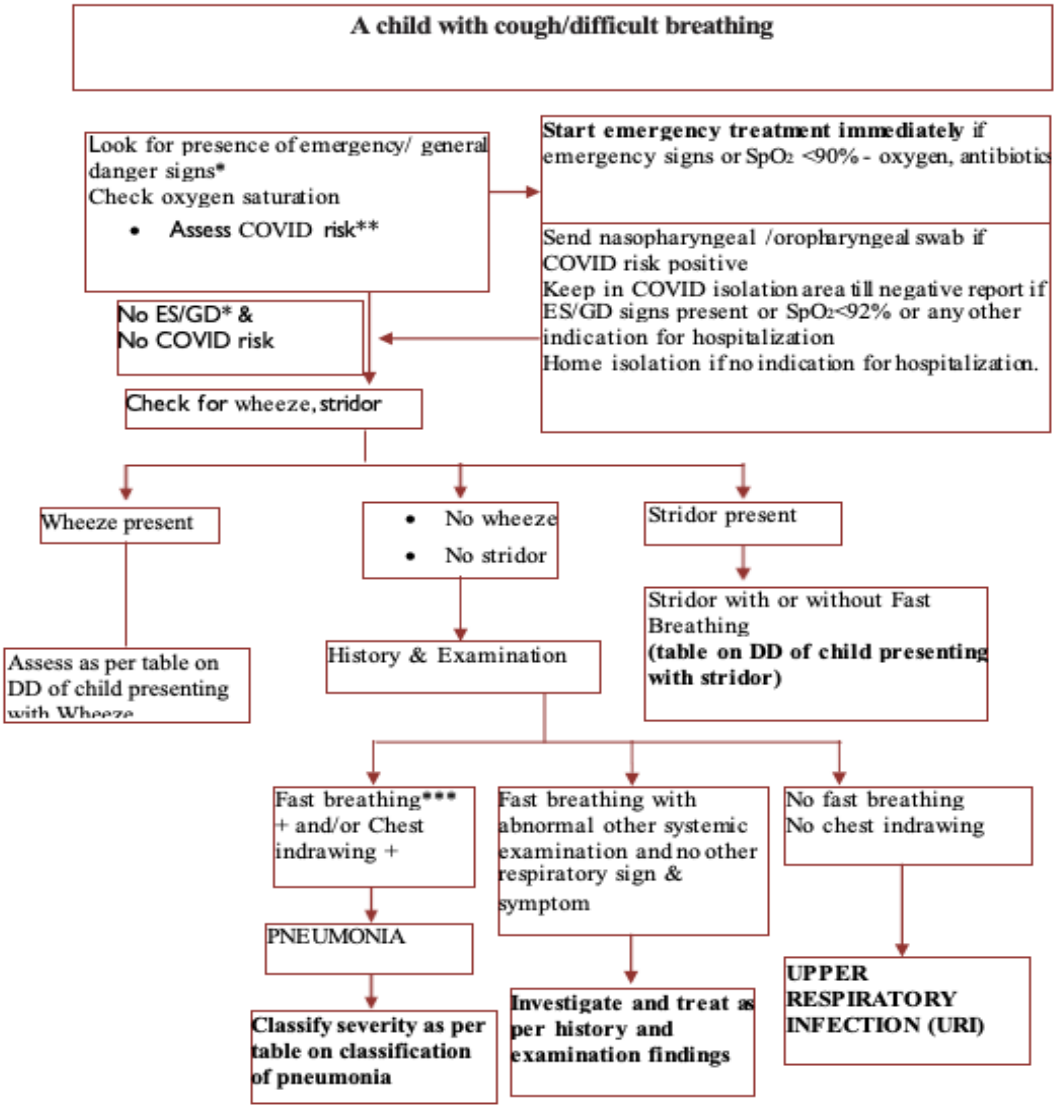
Day of life	Total Fluid (ml/kg/day)
1	60
2	80
3	100
4	120
5	140
6 onwards	150

2. Guidelines for feeding (volume and frequency) and modes of feeding

Feeding schedule
· Begin at 60-80 ml/kg/day, increase by 20 ml/kg/day, maximum of 150-180 ml/kg/day
· First feed at 2 hours of age then every 2 hourly

GUIDELINE FOR MODES OF PROVIDING ENTERAL FEEDS AND INTRAVENOUS FLUID			
Age	**GA 28 – 31 weeks**	**GA 32- 34 weeks**	**GA > 34 weeks**
Initial 24 hours of life	OG/NG feeding with IVF	Gavage	Direct breastfeeding. If not satisfactory, give EBM via cup and spoon
After 1 – 3 days	Gavage	EBM via cup and spoon	Direct breastfeeding
After 1 – 3 weeks	EBM via cup and spoon	Direct breastfeeding	Direct breastfeeding
After 4 – 6 weeks	Direct breastfeeding	Direct breastfeeding	Direct breastfeeding

Chart 18: Approach to a child with cough/difficulty breathing



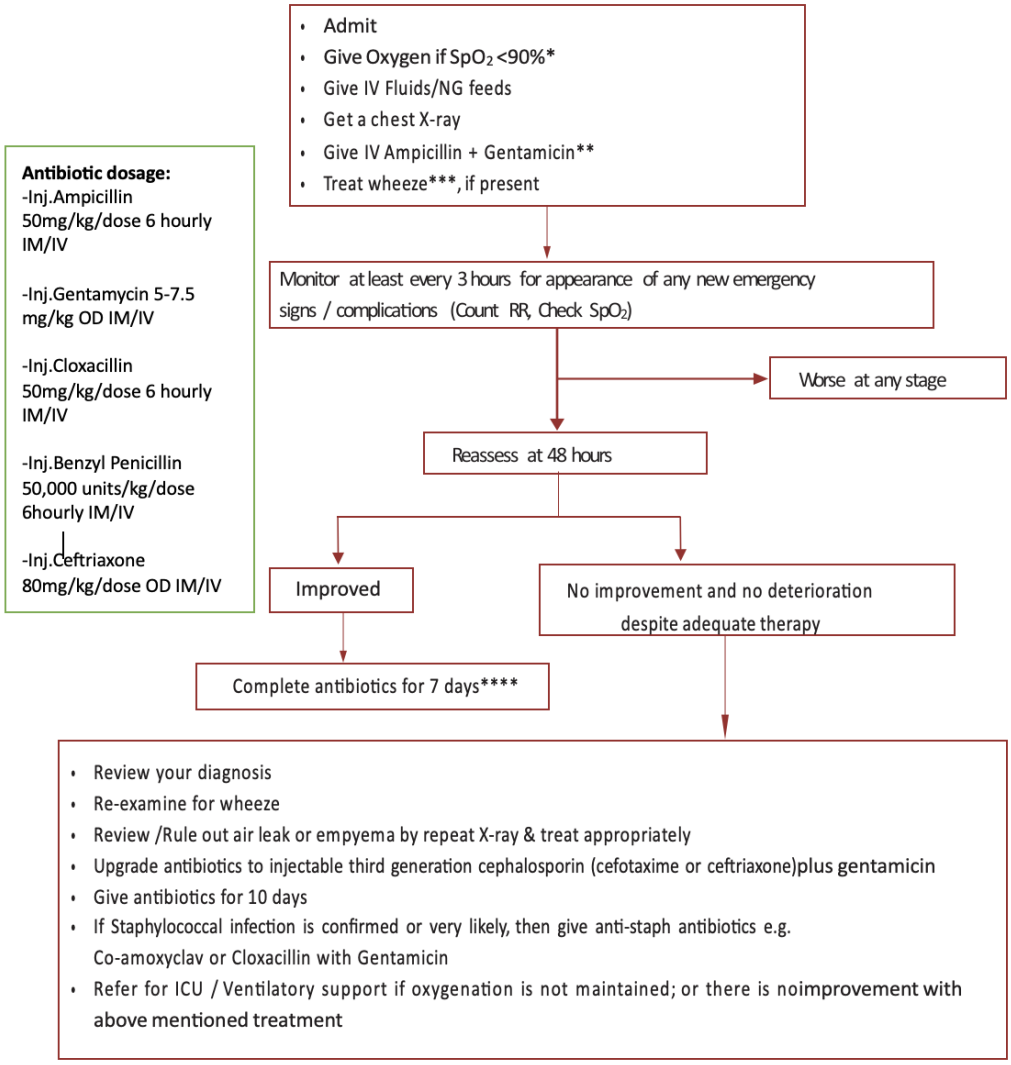
**Emergency/General Danger Signs (ES/GD): Not breathing at all or gasping, Obstructed breathing, Central cyanosis, Oxygen saturation <90%, Severe respiratory distress, Shock, Coma, Convulsions, Inability to breastfeed or drink or persistent vomiting (Initial management of children with emergency signs have already been covered in ELA1 Section 2).*

*** Fever with cough or loss of smell/taste or difficult breathing of less than 10 days or H/o contact with COVID case in last 2 weeks*

****Fast breathing: ≥ 60 breaths/min in a child aged <2 months; ≥50 breaths/min in a child aged from 2 months up to12 months; ≥ 40 breaths/min in a child aged from 1year up to 5 years.*

(Courtesy: F-IMNCI, Ministry of Health & Family Welfare, GOI, 2023)

Chart 19: Treatment of severe pneumonia



* < 94 % in presence of other emergency signs

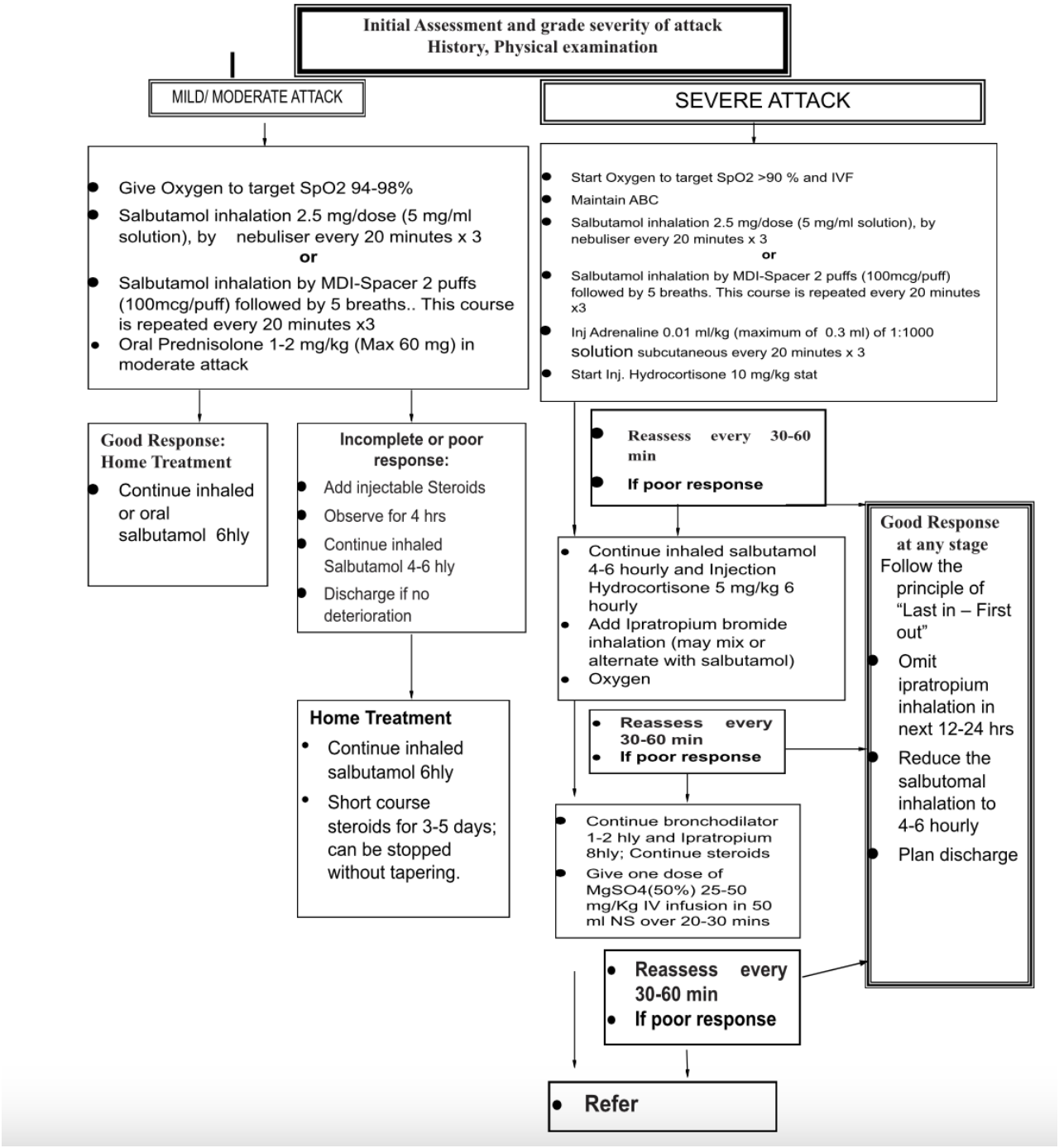
** If staphylococcal infection is suspected, give anti-staph antibiotic like Co-amoxyclav or Cloxacillin and Gentamicin; incase of severe pneumonia with septic shock consider Ceftriaxone and Vancomycin (Box 3.2)

***In case the child improves significantly with bronchodilator therapy, review the diagnosis

****Shift to oral drugs as soon as the child is able to take orally

(Courtesy: F-IMNCI, Ministry of Health & Family Welfare, GOI, 2023)

Chart 20: Management algorithm for Acute asthma and Asthma clinical score



Asthma clinical score (PRAM) to assess the severity of Asthma

Signs	0	1	2	3
Suprasternal Indrawing (Tracheal tug)	Absent		Present	
Scalene retractions (use of accessory muscles)	Absent		Present	
Wheezing	Absent	Expiratory only	Inspiratory and expiratoty	Audible without stethoscope/silent chest with minimal air entry
Air entry	Normal	Decreased at bases	Widespread decrease	Absent/minimal
Spo2 in room air	≥94%	90-93 %	≤89%	

Severity	Asthma Clinical Score
Mild	0-4
Moderate	5-8
Severe	9-12
Impending respiratory failure	Regardless of score,presence of lethargy ,cyanosis, decreasing respiratory effort,and/or rising pCO2

Chart 21: Diarrhoea Treatment Plan A: Treat Diarrhoea at Home

COUNSEL THE MOTHER ON THE 4 RULES OF HOME TREATMENT

1. GIVE EXTRA FLUID (AS MUCH AS THE CHILD WILL TAKE)

» TELL THE MOTHER :

If the child is exclusively breastfed: Breastfeed frequently and longer at each feed. If passing frequent watery stools:

- For less than 6 months of age give ORS in addition to breast milk
- If 6 months or older give one or more of the home fluids and ORS in addition to breast milk.

If the child is not exclusively breastfed: Give one or more of the following home fluids; ORS solution, yoghurt, milk, lemon drink, rice or pulses based drink, vegetable soup, green coconut water or plain clean water.

It is especially important to give ORS at home when:

- The child has been treated with Plan B or Plan C
- The child cannot return to the hospital if diarrhoea worsens.

» **TEACH THE MOTHER HOW TO MIX AND GIVE ORS. GIVE THE MOTHER 2 PACKETS OF ORS TO USE AT HOME.**

» **SHOW THE MOTHER HOW MUCH FLUID TO GIVE IN ADDITION TO THE USUAL FLUID INTAKE :**

Up to 2 years	50 to 100 ml after each loose stool
2 years or more	100 to 200 ml after each loose stool

Tell the mother to:

» Give frequent small sips from a cup.

» If the child vomits, wait 10 minutes. Then continue, but more slowly.

» Continue giving extra fluid until the diarrhoea stops.

2. GIVE ZINC SUPPLEMENTS

» TELL THE MOTHER HOW MUCH ZINC TO GIVE :

2 months Up to 6 months	10 mg per day for 14 days
6 months and more	20 mg per day for 14 days

» SHOW THE MOTHER HOW TO GIVE THE ZINC SUPPLEMENTS

» REMIND THE MOTHER TO GIVE THE ZINC SUPPLEMENT FOR THE FULL 10-14 DAYS.

3. CONTINUE FEEDING

4. WHEN TO RETURN: Advise mothers to return immediately if:

» Not able to drink or breastfeed or drinks poorly

» Becomes sicker

» Develops a fever

» Blood in stools

If the child shows none of these signs but is still not improving, follow-up at 5 days.

Chart 22: Diarrhoea Treatment Plan B: Treat Some Dehydration with ORS

GIVE RECOMMENDED AMOUNT OF ORS IN CLINIC OVER 4-HOUR PERIOD

» **Determine the amount of ORS to give during the first 4 hours.**

Age*	Up to 4 months	4 months up to 12 months	12 months up to 2 years	2 years up to 5 years
Weight in ml	< 6 kg 200-400	6 - < 10 kg 400-700	10 - < 12 kg 700-900	12 – 19 kg 900-1400

* Use the child's age only when you do not know the weight. The approximate amount of ORS required (in ml) can also be calculated by multiplying the child's weight (in Kg) by 75.

If the child wants more ORS than the amount given above, more ORS can be given to the child.

» **Show the mother how to give ORS solution:**

- Give frequent small sips from a cup.
- If the child vomits, wait 10 minutes. Then continue, but more slowly.
- Continue breastfeeding but stop other feeding.

Reassess after 4 hours:

- Reassess the child and classify the child for dehydration.
- Select the appropriate plan to continue treatment.
- Begin feeding the child

» **If the mother must leave before completing treatment :**

- Show her how to prepare an ORS solution at home.
- Show her how much ORS to give to finish 4-hour treatment
- Give her enough ORS packets to complete rehydration. Also give 2 packets as recommended in Plan A.
- Explain the 4 Rules of Home Treatment :
  1. Give extra fluid
  2. Give zinc supplements
  3. Continue feeding
  4. When to return

} Plan A

Chart 23: How to treat severe dehydration in an emergency setting (Plan C): if no severe malnutrition

» Start IV fluid immediately. If the child can drink, give ORS by mouth while the drip is being set up. Give 100 ml/kg Ringer's lactate solution (or, if not available, normal saline), divided as follows:

AGE	First give 30 ml/kg in	Then give 70 ml/kg in
Infants (under 12 months)	1 hour*	5 hours
Children (12 months up to 5 years)	30 minutes*	$2^{1}/_{2}$ hours

* Repeat once if the radial pulse is still very weak or not detectable.

» Reassess the child every 15-30 minutes. If hydration status is not improving, give the IV drip more rapidly.

» Also give ORS (about 5 ml/kg/hour) as soon as the child can drink: usually after 3-4 hours (infants) or 1-2 hours (children).

Weight	Volume of ORS solution per hour
<4 kg	15 ml
4 - <6 kg	25 ml
6 - <10 kg	40 ml
10 - <14 kg	60 ml
14 – 19 kg	85 ml

» If IV treatment not possible, give ORS 20 ml/kg/hour for 6 hours(120 ml/kg) by NG tube

» Reassess an infant after 6 hours and a child after 3 hours. Reclassify dehydration. Then choose the appropriate plan (A,B, or C) to continue treatment

» If IV treatment not possible, give ORS 20 ml/kg/hour for 6 hours(120 ml/kg) by NG tube

» Give oral antibiotics for cholera if child 2 years or older.

» If possible, observe the child for at least 6 hours after rehydration to be sure that the mother can maintain hydration by giving the child ORS solution by mouth.

Chart 24: Management of dysentery

CHILD WITH LOOSE STOOL WITH BLOOD ↓		
Severely Malnourished ?	→ Yes →	
↓ NO		
↓ Give Antimicrobial For Shigella		Admit
↓ Better In 2 Days	→ Yes →	
↓ NO		Complete 3 Days Treatment
↓ Dehydrated, Age < 1 Year Or Measles in Past 6 Weeks	→ Yes →	Admit
↓ NO		
↓ Change To Second Antimicrobial For Shigella		Complete 3 Days Treatment
↓ Better In 2 Days	→ Yes →	
↓ NO		
↓ Admit Or Treat For Amoebiasis		

Antimicrobials that are effective for treatment of Shigellosis	Antimicrobials that are INEFFECTIVE for treatment of Shigellosis
Cotrimoxazole (4 mg/Kg/dose of Trimethoprim) BD for 5 days OR Ciprofloxacin 15mg/Kg BD for 3 days OR Ceftriaxone (75 mg/kg) IM/IV OD for 5 days	» Metronidazole » Tetracyclines - Chloramphenicol » Amoxicillin » Nitrofurans (e.g. nitrofurantoin) » Aminoglycosides (e.g. gentamicin) » Cephalosporins (e.g. Cephalexin)

Chart 25: Management of persistent diarrhoea

Admit the child with persistent diarrhoea if:

» dehydrated (severe persistent diarrhoea) or
» has associated severe malnutrition or severe illness, or
» no improvement with OPD management for persistent diarrhoea

Treatment

» Manage dehydration as per Plan A, B or C
» Screen for and treat associated systemic infections (pneumonia,
» otitis media, UTI, dysentery, amoebiasis, giardiasis)
» Supplementary multivitamins and minerals for at least 2 weeks
» Feeding

Up to 6 months

- Encourage exclusive breastfeeding. Help mothers who are not breastfeeding exclusively to do so.
- If a child is not breastfeeding, give a breast milk substitute that is low in lactose such as yogurt or is lactose free commercial formula. Use a spoon or cup; do not use a feeding bottle. Once the child improves, help the mother to re-establish lactation.

6 months or older

- Feeding should be restarted as soon as the child can eat. Reduced lactose diet should be given 6 times a day to achieve a total intake of at least 110 calories/kg/day). Many sick children will eat poorly, until any serious infection has been treated for 24–48 hours. Such children may require nasogastric feeding initially.

Recommended diets for persistent diarrhoea

The Initial Diet A:[Reduced lactose diet; milk rice gruel, milk sooji, gruel, rice with curd]

Ingredients	Measure	Approximate quantity
Milk	1/3 cup	40 ml
Sugar	½ level tsp	2 g
Oil	½ level tsp	2 g
Puffed rice powder*	4 level tsp	12.5 g
Water		To make 100 ml
Calories/100 grams	96 Kcal	
Protein/ 100 grams	2.4 grams	

* Can be substituted by cooked rice or sooji

The second Diet B: [Lactose-free diet with reduced starch]

Ingredients	Measure	Approximate quantity
Egg white	3 level tsp	15 g
Glucose	3/4 level tsp	3 g
Oil	1 level tsp	4 g
Puffed rice powder*	2 level tsp	7 g
Water	¾ cup	To make 100 ml
Calories/ 100 grams	78 Kcal	
Proteins/ 100 grams	2.3 grams	

* Can be substituted with cooked rice

The Third Diet C: [Monosaccharide based diet]

Ingredients	Measure	Approximate quantity
Chicken or Egg white	2 ½ level tsp 5 level tsp	12 g 25 g
Glucose	¾level tsp	3 g
Oil	1 level tsp	4 g
Water	½ - ¾ cup	To make 100 ml
Calories / 100 grams	60 Kcal	
Proteins / 100 grams	3 grams	

Chart 26: Management of severe and complicated malaria cases

Ask	Look for	Laboratory Investigations	Treatment
Change of behavior, confusion, drowsiness, and generalized weakness.	» fever » lethargic or acidosis (presenting with deep, labored breathing) » generalized weakness (prostration), so that the child can no longer walk or sit up without assistance » jaundice » respiratory distress, pulmonary oedema » shock » bleeding tendency » severe palmar pallor	» Blood smear for MP/RDT » Haemoglobin » Blood glucose » Lumbar puncture » (if not contraindicated to exclude meningitis)	**Emergency measures: to be taken within the first hour** » Check and correct hypoglycaemia » Treat convulsions » Manage shock, If present » If the child is unconscious, minimize the risk of aspiration pneumonia (Insert a nasogastric tube and remove the gastric contents) » Treat severe anaemia, .if present » Antimalarial treatment » Provide supportive care if child is unconscious » Give treatment for bacterial meningitis if cannot be excluded

Drugs for Malaria:

Refer National Malaria Treatment Guideline

Treatment for severe malaria
(Follow the latest National Malaria treatment guideline/ WHO guideline)

Drug	Route of administration	Schedule
Quinine	IV	*Loading dose* of 20mg/kg body weight of quinine dihydrochloride salt given over a 4 hour period in IV fluid (glucose 5% preferred to prevent hypoglycemia) then give *maintenance dose* of 10 mg/kg after 8 hours and repeated 8 hrly until the patient is able to take Quinine tablet orally. The oral dose of quinine is 10mg/kg body weight given every eight hours. The total duration of treatment is 7 days including both IV and oral treatment. The infusion rate should not exceed 5mg/kg body weight per hour. Quinine can be given by IM injections in the same dosage if IV infusion is not possible. It should be diluted in normal saline to a concentration of 60-100 mg/ml salt, the dose divided equally and administered on the two anterior thighs (not on the buttock).
Artemether	IM	3.2mg/kg body weight IM given on admission then 1.6mg/kg IM once a day followed by a full course of combination therapy (Coartem®) as soon as the patient can swallow.
Artesunate	**IM/IV/Rectal**	**2.4mg/kg body wt., IM/IV given at 0, 12hr, 24 hrs followed by once a day for 7 days.** **Rectal dose 10mg/kg body weight, repeated if expelled within 30 minutes of insertion.**

NOTE:
Antimalarial drugs should be given parenterally for a minimum of 24 hours and replaced by oral medications as soon as it can be tolerated.

Chart 27: Management of bacterial meningitis

Ask	look for	Laboratory Investigations	Treatment
» Vomiting » Inability to drink or breastfeed » Headache or pain in back of neck » Convulsions » Irritability » A recent head injury	» Stiff neck » Repeated convulsions » Lethargy » Irritability » Bulging fontanelle » A petechial rash or purpura » Evidence of head trauma suggesting possibility of a recent skull fracture Also, look for any of the following signs of raised intracranial pressure: » Unequal pupils » Rigid posture or posturing » Focal paralysis in any of the limbs or trunk » Irregular breathing	» Blood glucose » Lumbar puncture » (if not contraindicated to exclude meningitis) » Blood smear for MP in malarious area	» Admit in hospital » Manage convulsions Manage hypoglycemia » Give antibiotic treatment* » Give daily fluids » Treat malaria if present » Provide acute nutritional support and nutritional rehabilitation » Review therapy when CSF results are available » In confirmed cases give treatment for 10 days

Dexamethasone: 0.15mg/kg/dose 6 hourly (give 20-30 minutes before antibiotics) for 4 days

*For antibiotic treatment choose one of the following regimens:

1. Chloramphenicol: 25 mg/kg IV every 6 hours PLUS Ampicillin: 50 mg/kg IV every 6 hours for 10 days

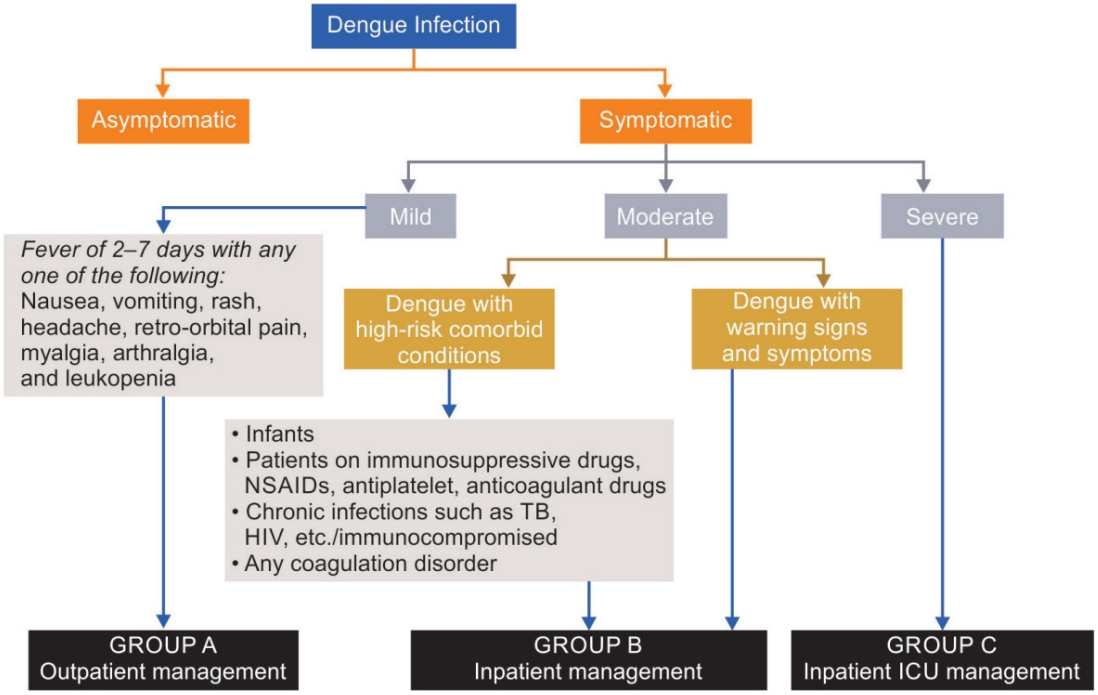
OR

2. Chloramphenicol: 25 mg/kg IV every 6 hours
   PLUS Benzylpenicillin: 60 mg/kg (100 000 units/kg) every 6 hours IV for 10 days

OR

3. Ceftriaxone: 50 mg/kg IV, over 30–60 minutes every 12 hours; or 100 mg/kg IV, once daily for 7-10 days;

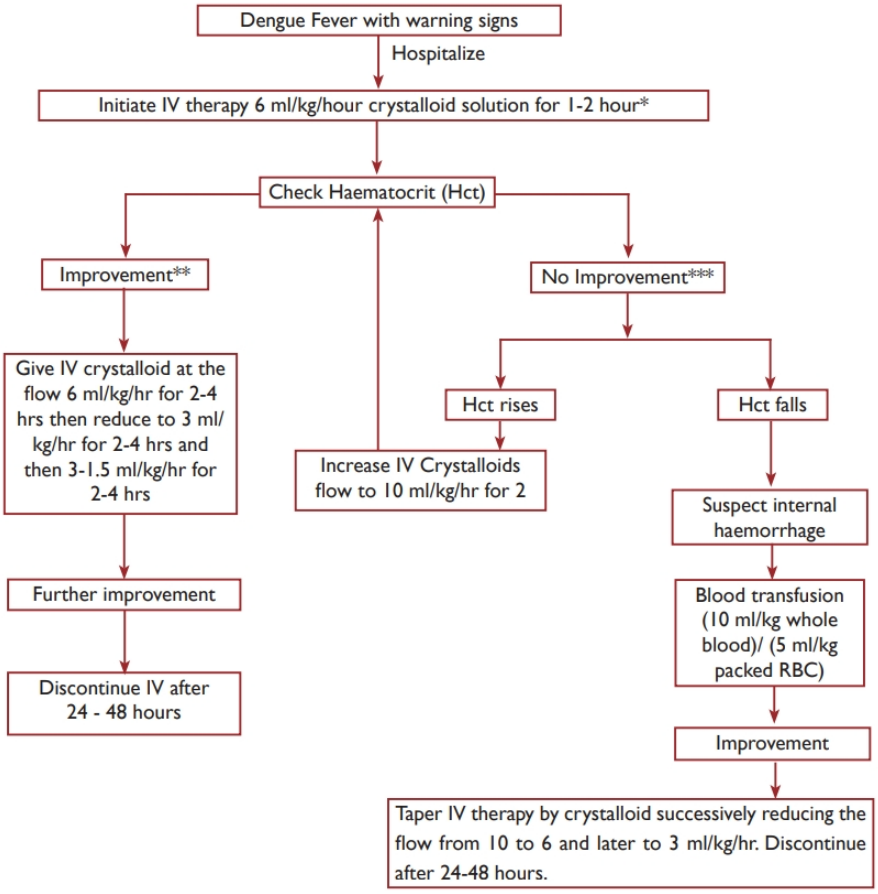
Chart 28 A: Clinical features and Case Classification Dengue infection based on severity



(ICU: intensive care unit; HIV: human immunodeficiency virus; TB: tuberculosis)

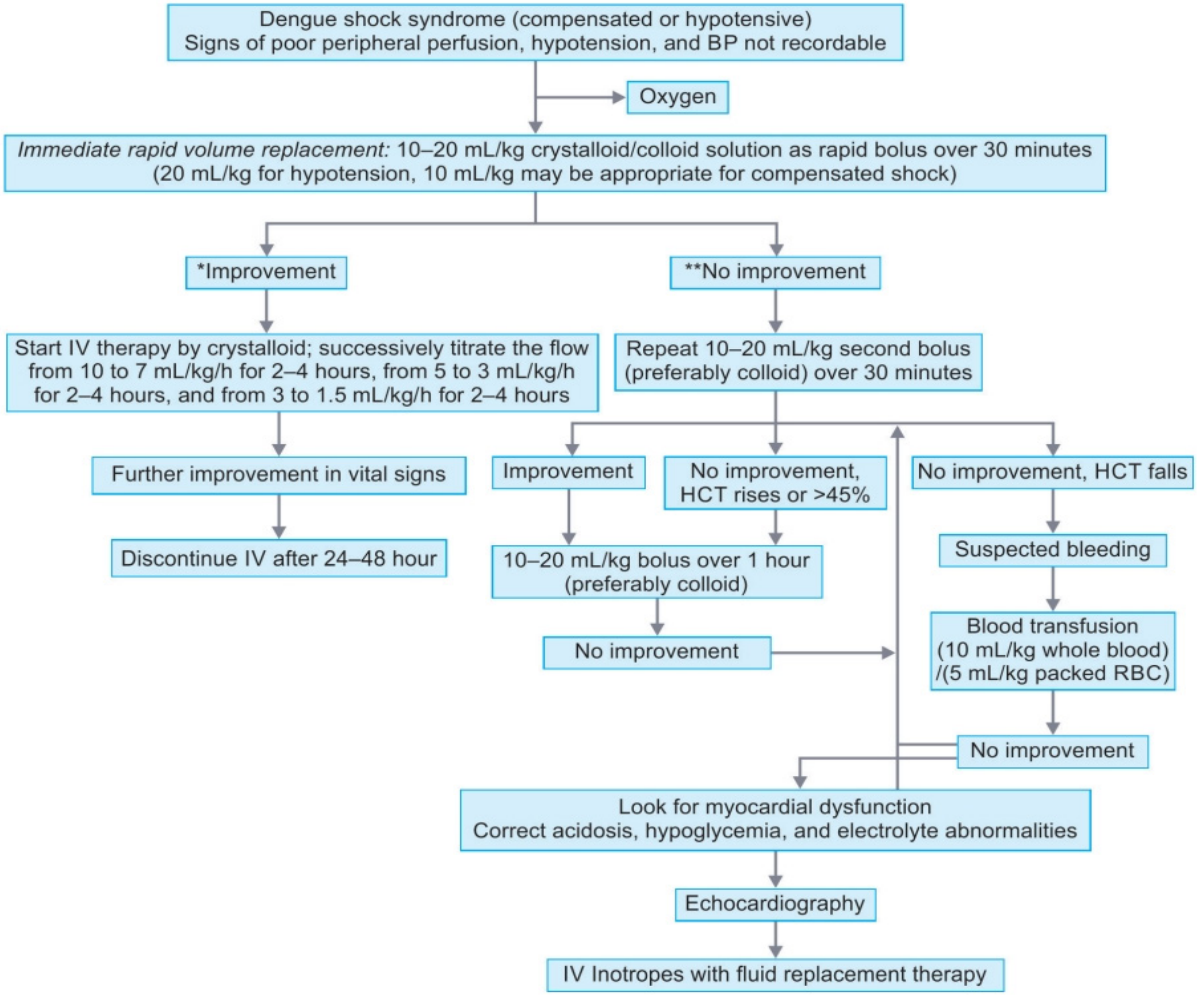
(Courtesy: IAP guideline on childhood dengue 2022)

Chart 28B: Fluid management for patients with dengue fever with warning signs



(Courtesy: F-IMNCI, Ministry of Health & Family Welfare, GOI, 2023)

Chart 28C: Fluid management algorithm for dengue patients with dengue shock (Hypotensive or Compensated)



(HCT: hematocrit; IV: intravenous; RBC: red blood cells)

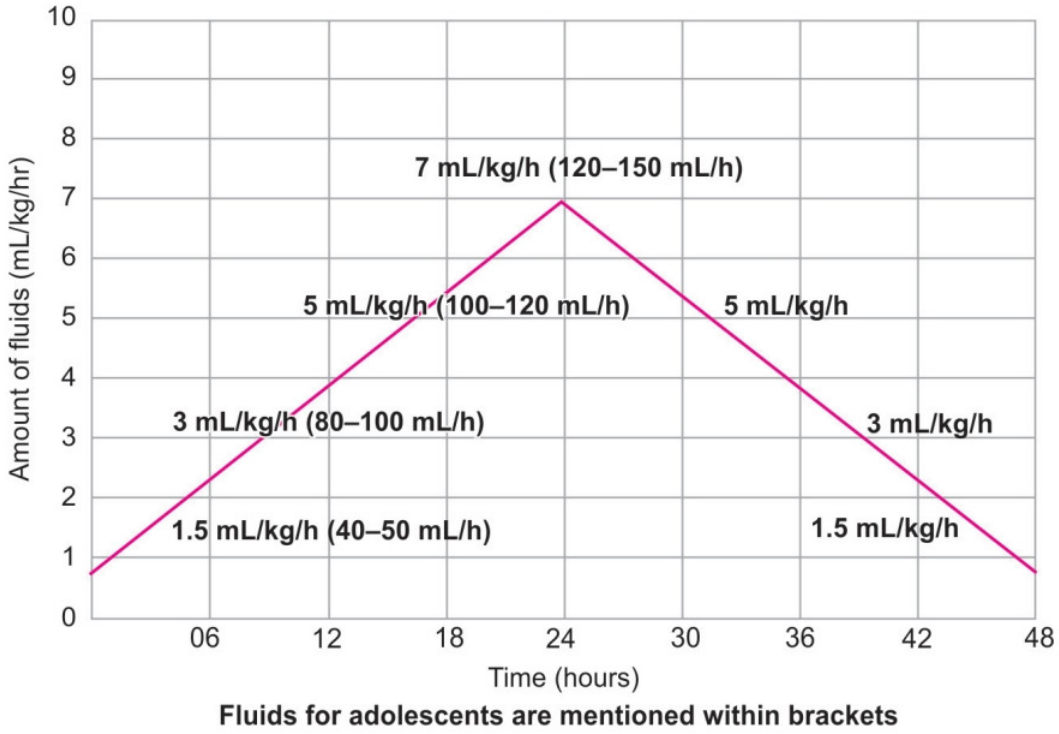
Notes:

*Improvement: Hct falls, pulse rate and blood pressure stable, urine output rises

**No improvement: Hct or pulse rate rises, pulse pressure falls < 20mmHg and urine output falls.

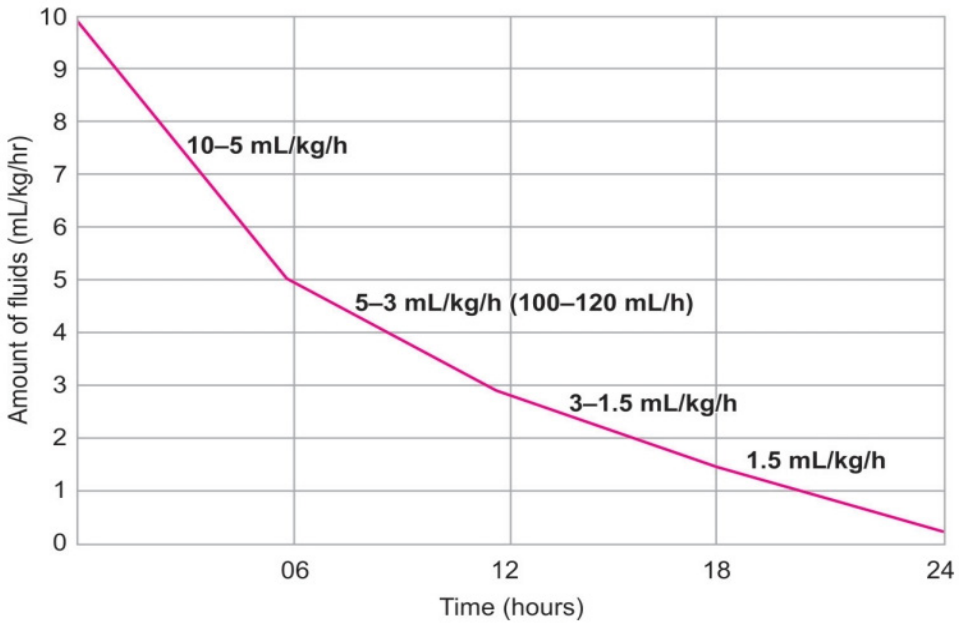
(Courtesy: IAP guideline on Dengue Shock, 2022)

Chart 29A: Empiric Guide to safe fluid therapy in dengue patients with warning signs at bedside in resource-limited setting



(Courtesy: WHO collaborating for case management of Dengue/DHF/DSS. Bangkok,Thailand: Queen Sirikit National Institute of child health.)

Chart 29B: Guide for the IV fluids rate in profound shock after initial resuscitation (This chart can be used as a guide in resource limited settings)



(Courtesy: WHO collaborating for Case Management of Dengue/DHF/DSS.Bangkok,Thailand:Queen Sirikit National of Child Health)

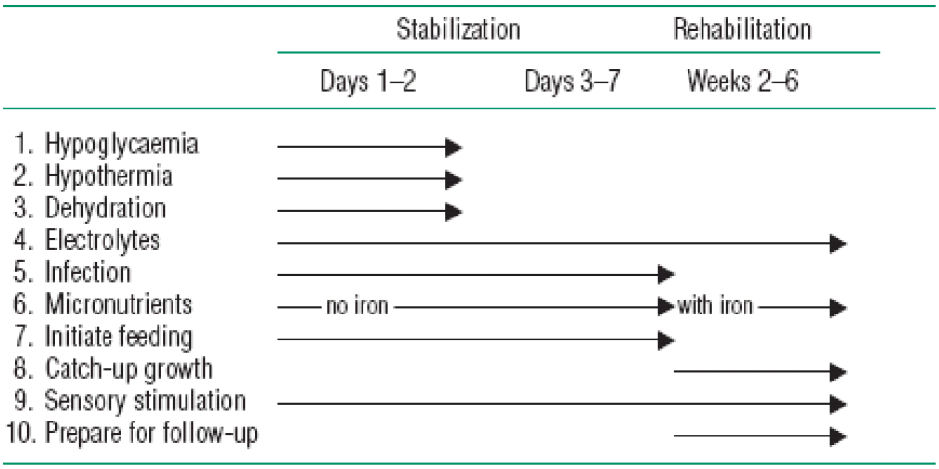
Chart 30: Management of severe malnutrition in a hospital

CRITERIA FOR HOSPITAL ADMISSION:

- » Weight for Height/Length <-3 Z score of median of WHO child growth standards OR
- » Bipedal edema
- » Mid-upper arm circumference <115mm

PROVIDING GENERAL TREATMENT FOR MALNUTRITION

There are ten essential steps in two phases: an initial stabilization phase and a longer rehabilitation phase.



Criteria for discharge from hospital care

	Criteria
Child	» Weight for height reached -1SD(90%) of NCHS/WHO median reference value » Eating adequate amount of nutritious food that mother can prepare at home » Consistent weight gain » All vitamin and mineral deficiencies have been treated » All infections and other conditions have been treated or are being treated like anemia, diarrhoea, malaria, tuberculosis » Full immunization programme started
Mother or caretaker	» Able to take care of the child » Able to prepare appropriate foods and feed the child » Has been trained to give structured play therapy and sensory stimulation » Knows how to give home treatment for common problems and recognize danger signs warranting immediate medical assistance
Health worker	» Able to ensure follow-up of the child and support the caretaker

Chart 30 contd…: General treatment for malnutrition

Step 1⇒ Hypoglycaemia: Immediately on admission, give a feed or10% glucose or sugar solution. Frequent feeding is important.

Step 2⇒ Hypothermia: Make sure the child is clothed. Place a heater (not pointing directly at the child) or lamp nearby, or put the child on the mother's bare chest or abdomen (skin-to-skin) and cover them with a warmed blanket and/or warm clothing. Do not use hot water bottles.

Step 3⇒ Dehydration: Rehydrate orally or through a nasogastric tube. IV rehydration should be used only if the child has signs of shock and is lethargic or has lost consciousness

Calculate amount of ORS (Re-SoMal) to give

How often to give ORS(Re-SoMal)	Amount to give
Every 30 minutes for the first 2 hours	5 ml/kg body weight
Alternate hours for up to 10 hours	5-10 ml/kg*

* The amount offered in this range should be based on the child's willingness to drink and the amount of ongoing losses in the stool. F-75 is given in alternate hours during this period until the child is rehydrated.

Step 4⇒ Electrolyte imbalance: Give extra potassium (3–4 mmol/kg daily).

Syrup KCl (15 ml=20 meq) can be added to the feeds.
Give extra magnesium.

Step 5⇒ Infection: Give Injection Ampicillin 25 mg/kg/dose 6 hourly and Inj. Gentamicin 5- 7.5 mg/kg OD for 7 days to all admitted cases

Step 6⇒ Micronutrients: Give oral vitamin A in a single dose. Give same dose on Day 0,1 and 14 if there is clinical evidence of vitamin A deficiency

Multivitamin supplement (should contain vitamin A,C,D,E and B12& not just vitamin B-complex): Twice the Recommended Daily Allowance and for at least 2 weeks

- Folic acid: 5mg on day 1, then 1 mg/day
- Zinc: 2mg/kg/day
- Copper: 0.3 mg/kg/day
- When weight gain commences and there is no diarrhoea, add 3 mg of iron /kg/day

Step 7⇒ Initiate feeding: Give initial feeding(F-75)

Days	Freq	Vol/kg/feed	Vol/kg/day
1-2	2 hourly	11 ml	130 ml
3-5	3 hourly	16 ml	130 ml
6 onwards	4 hourly	22 ml	130 ml

Step 8⇒ Catch-up growth: Replace the starter F-75 with an equal amount of catch-up F-100 for 2 days,on the 3rd day increase each successive feed by 10 ml as long as the child is finishing feeds. Continue this until some feed remains uneaten.

Step 9⇒ Sensory stimulation: Provide a caring and stimulating environment

Step 10⇒ Discharge and prepare for follow-up

Chart 31: Diets recommended in severe malnutrition

Initial diets recommended in severe malnutrition: F-75

Diets contents (per 100ml)	F-75 Starter	F-75 Starter (Cereal based) Ex: 1	F-75 Starter (Cereal based) Ex: 2
Fresh milk or equivalent (ml)	30	30	25
Sugar (g) (approximate measure of one level teaspoon)	9 (1 + 1/2)	6 (1)	3 (1/2)
Cereal flour: Powdered puffed rice (g) (approximate measure of one level teaspoon)	--	2.5 (3/4)	6 (2)
Vegetable oil (g) (approximate measure of one level teaspoon)	2 (1/2)	2.5 (1/2+)	3 (3/4)
Water: make up to (ml)	100	100	100

Recommended schedule of F-75 with gradual increase in feed volume is as follows:

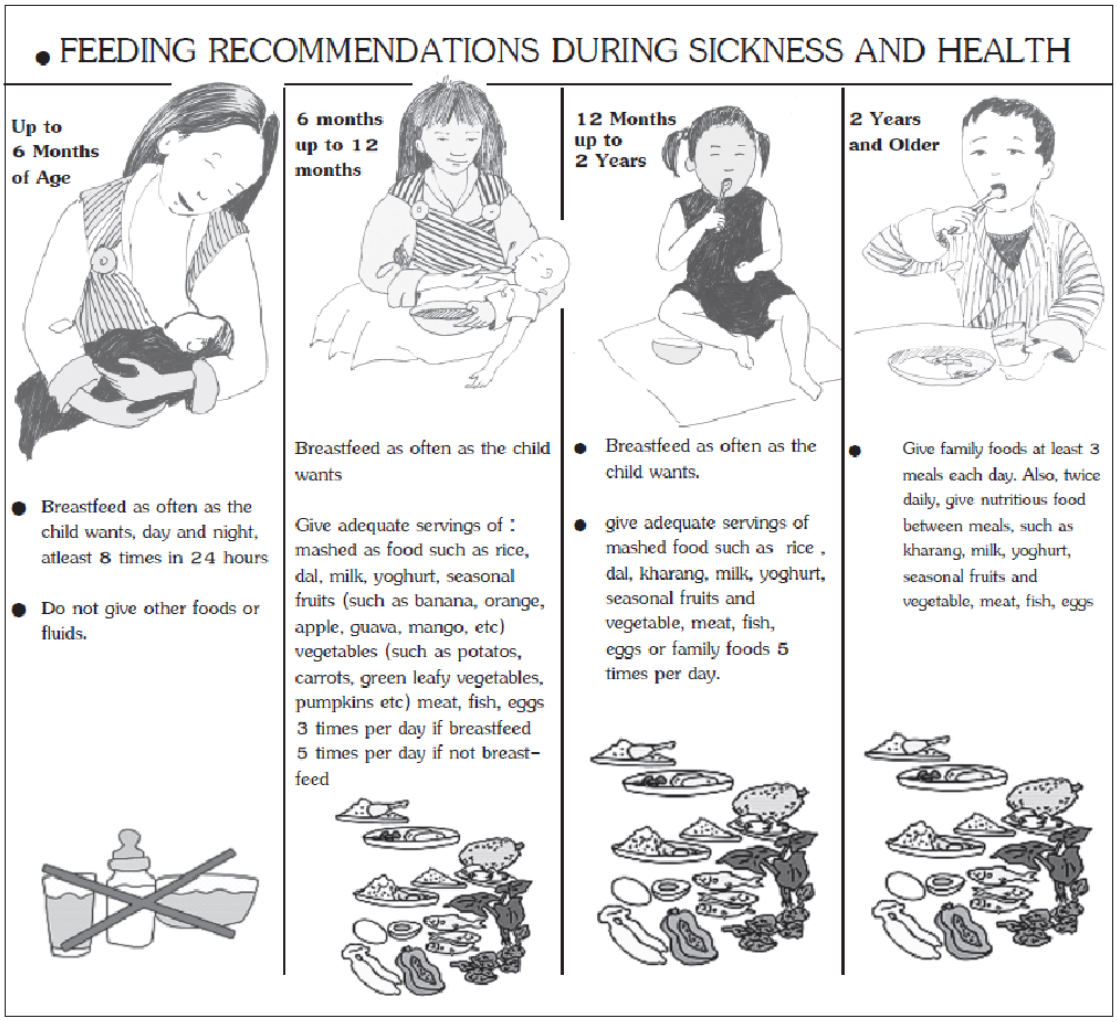
Days	Freq	Vol/kg/feed	Vol/kg/day
1-2	2 hourly	11 ml	130 ml
3-5	3 hourly	16 ml	130 ml
6 onwards	4 hourly	22 ml	130 ml

Catch Up diets recommended in severe malnutrition: F-100

Diets Contents (per 100ml)	F-100 Catch-up	F-100 Catch-up (cereal based) Ex: 1
Fresh milk or equivalent (ml)	95	75
Sugar (g) (approximate measure of one level teaspoon)	5 (1)	2.5 (1/2-)
Cereal flour: Puffed rice (g) (approximate measure of one level teaspoon)	--	7 (2)
Vegetable oil (g) (approximate measure of one level teaspoon)	2 (1/2)	2 (1/2)
Water to make (ml)	100	100

Chart 32: Counsel the Mother

Feeding Recommendations during Sickness and Health



* A good quality food should be adequate in quantity and include an energy-rich food (for example, thick cereal with added oil); meat, fish , eggs or pulses; and fruits and vegetables.

Chart 33: Intravenous fluids

Intravenous fluids

The following table gives the composition of intravenous fluids that are commercially available and commonly used in neonates, infants and children. Please note that none of the fluids contains sufficient calories for the long-term nutritional support of children. Oral feeding and administration of fluids by mouth or nasogastric tube, whenever possible, is always preferred to intravenous fluid.

	Composition						
	Na+	K+	Cl-	Ca++	Lactate	Glucose	Calories
IV fluid	mmol/l	mmol/l	mmol/l	mmol/l	mmol/l	G/l	/l
Ringer's lactate (Hartmann's)	130	4.0	112	1.8	27	-	-
Normal saline (0.9% NaCl)	154	-	154	-	-	-	-
5% Glucose	-	-	-	-		50	200
10% Glucose	-	-	-	-	-	100	400
0.45 NaCl / 5% glucose	77	-	77	-	-	50	200

Fluid Management

The total daily fluid requirement of a child is calculated with the following formula:

- For the first 10 kg, 100 ml/kg
- For the next 10 kg, 50 ml/kg
- For each subsequent kg, 25 ml/kg

For example, an 8 kg baby receives 8 x 100 ml = 800 ml per day, a 15 kg child receives 1250 ml/ day (10 x 100) + (5 x 50)

Maintenance fluid requirements

Body weight of child	Fluid (ml/day)
2 kg	200 ml/day
4 kg	400 ml/day
6 kg	600 ml/day
8 kg	800 ml/day
10 kg	1000 ml/day
12 kg	1100 ml/day
14 kg	1200 ml/day
16 kg	1300 ml/day
18 kg	1400 ml/day
20 kg	1500 ml/day
22 kg	1550 ml/day
24 kg	1600 ml/day
26 kg	1650 ml/day

Give the sick child more than the above amount if there is fever (increase by 10% for every 1^0 C of fever).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