

Assessing and treating the very sick child

Preventing collapse



Aim

To learn how to assess a child who is very sick but has signs of life

And make immediate decisions about treatment

This child is at risk of collapse and needs urgent treatment

A safe and systematic approach

- 4Ss - Safe, Stimulate, Shout, Setting
- Airway
- Breathing
- Circulation
- Coma, Confusion, Convulsions
- Dehydration

A safe and systematic approach

- 4Ss - Safe? Stimulate? Shout for help? Setting?
- Airway
 - Does it need clearing or support?
- Breathing
 - Is oxygen required? Rarely bronchodilators
- Circulation
 - Is intervention required? –Fluids or blood
- Convulsions, Coma or Confusion
 - Is the child fitting now?
 - Is dextrose needed?
- Dehydration in a child with diarrhoea

The S's in a seriously ill child

- Safety
 - gloves / hand gel / sharps / hazards
- Stimulate
 - *If alert you DO NOT need to stimulate*
- Shout
 - if the child looks seriously ill get help
- Setting
 - Are you in the best part of the hospital to work
 - Is further assessment best on a bed / couch or in the caretaker's arms?

Maintain temperature

Small, sick and malnourished children get cold fast which increases the risk of death

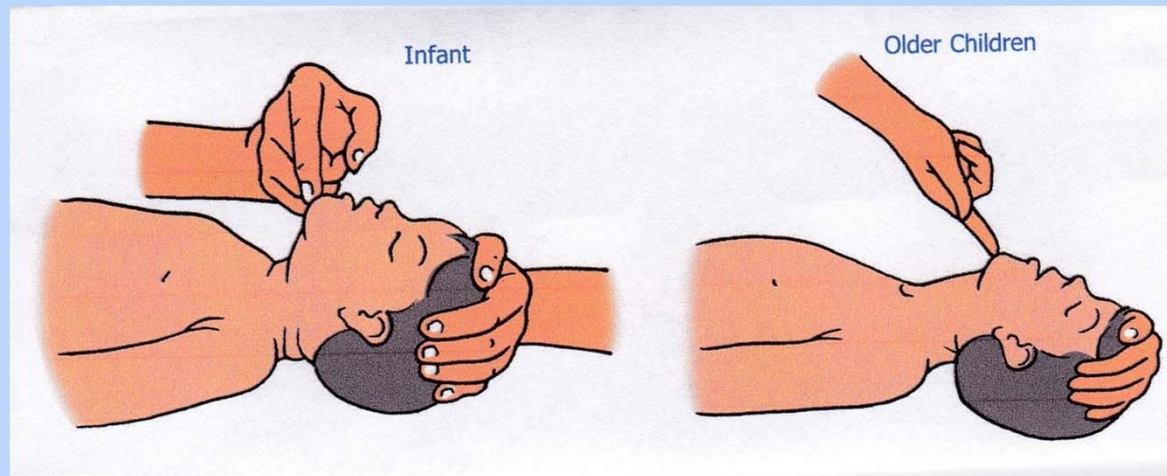
- Keep infant/child dry and wrapped
- Use cap, socks, blankets
- Keep room warm, avoid drafts
- Use radiant warmer cautiously

A- Airway

- ***If alert -***
 - Listen for noisy breathing
 - Stridor / choking?

A- Airway

- ***If not alert*** the infant / child should be on a couch or bed so –
 - Look in the mouth – any obvious obstruction?
 - Airway positioning or support needed?



Rapidly assess breathing – why?

Inadequate breathing results in poor delivery of oxygen to all the body:

- Can cause altered conscious level
- Will result in complete collapse (respiratory arrest) if not treated

Is the child alert?

What can you see here?



Cyanosis



How do we assess breathing?

Rapidly assess breathing

- Respiratory rate*:
 - Very Fast?
- Respiratory Effort
 - Grunting?
 - Head nodding / bobbing?
 - Indrawing?
 - Deep / acidotic breathing?
- Wheeze
- Crackles
- Reduced air entry
- *Pulse oximetry*

If saturation <90%
Give oxygen



* *NB very slow breathing or gasping may require BVM ventilation*

If breathing is inadequate

- Child not alert
- Breathing slow or irregular
- What action may be required?

If breathing is inadequate

- Child not alert
- Breathing slow or irregular
- May need to start ventilation with bag and mask



Without a pulse oximeter?

IF ANY OF THESE SIGNS PRESENT:

- Central Cyanosis
- Fast breathing >70bpm
- Grunting
- Head nodding / bobbing
- Severe chest indrawing
- AVPU<A with respiratory distress



Absolute indications for oxygen in a seriously ill child before proceeding to complete examination

Consider oxygen if:

- Deep / acidotic breathing
- Wheeze and inability to talk

Administering Oxygen

Use the most comfortable and economical method

■ Nasal Prongs

- Place the prongs just inside the nostrils and secure with tape.



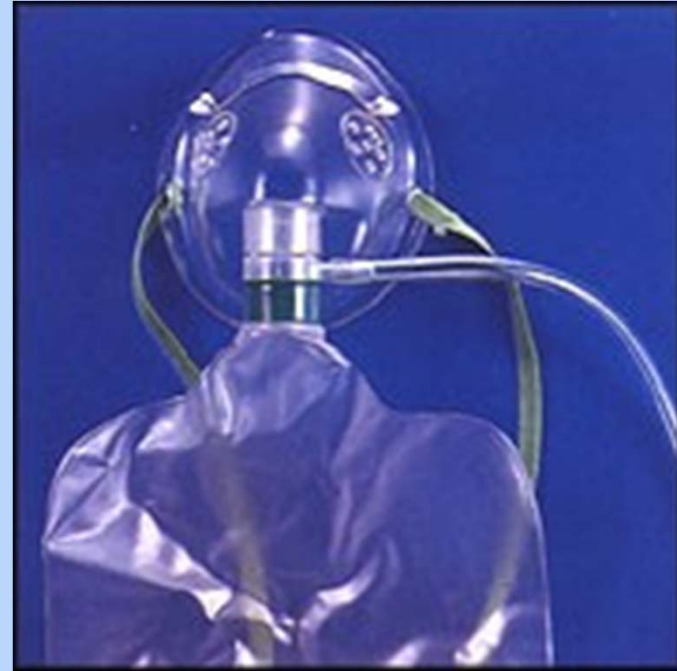
Use **0.5-1 L/min** in infants

1-2L/min in older children

Administering Oxygen?



Mask, 50-60% oxygen.
Needs 5-6 L/min oxygen
flow
Poorly tolerated by infants



Mask with reservoir bag,
80 - 90 % oxygen.
Needs 10-15 L/min oxygen
flow
Poorly tolerated by infants

Very severe respiratory distress – Other supportive measures

- Position
 - Propped up / forward
- Minimal handling / distress
- Assisted feeding / maintenance fluids
- If wheezing is present give bronchodilator
 - Nebulised salbutamol

C -Improving circulation to prevent collapse

- How do we assess circulation?

C -Improving circulation to prevent collapse

- How do we assess circulation?
 - Large pulse (very fast/slow)?
 - Peripheral pulse (present/weak)?
 - Temperature gradient?
 - Capillary Refill Time?
 - Press for 3 seconds
 - Sternum for infant
 - Nail-bed for child

C -Improving circulation to prevent collapse

- Severely impaired circulation – shock:
 - **All of the features:**
 - Fast pulse (central)
 - Weak/absent peripheral pulse
 - Cold extremities
 - Capillary refill >3s

Recognising types of shock

Shock:

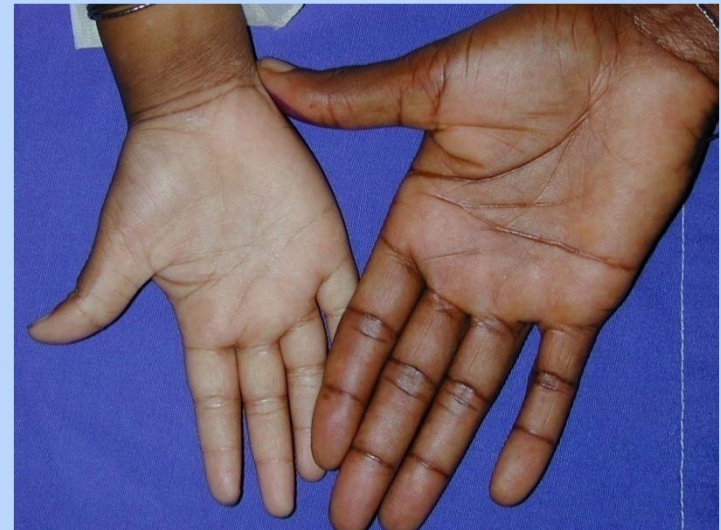
- severely impaired circulation
- leading to reduced organ perfusion / oxygenation

The most common causes of circulatory failure

- Dehydration



- Anaemia



Recognising types of shock

Different types of shock:

1. History of diarrhoea with signs of dehydration – hypovolaemic shock
2. Severe pallor and respiratory distress – anaemia
3. Shock in severe malnutrition
4. Other types of shock (without history of diarrhoea)
 - Septic shock, dengue shock syndrome, anaphylaxis, burns, trauma, cardiogenic

Recognising types of shock

1. History of diarrhoea with signs of dehydration and severely impaired circulation – hypovolaemic shock
 - Management is with a rapid fluid bolus

Recognising types of shock

For all other types of shock increasing evidence that rapid fluid boluses may cause harm

- Especially in settings without intensive care and ability to provide assisted ventilation if required
- More cautious fluid replacement
- Management according to specific treatment algorithms e.g. for dengue
- Reassessment

To make decisions on use of fluids and blood we need to know:

1. How severe is the circulatory problem?
- 2. Is the problem likely to be caused by diarrhoea?**
3. Is there severe anaemia?
4. Is there severe malnutrition?

Rapid Assessment of Circulation –

If there are signs of life there is a pulse

- Large pulse (very fast/slow)?
- Peripheral pulse (present/weak)?
- Temperature gradient?
- Capillary Refill Time?

- History of diarrhoea / sunken eyes / skin pinch?
- Pallor?
- Severe wasting / oedema?

Diarrhoea with severely impaired circulation= Hypovolaemic Shock



All of the features:

- Fast pulse (central)
- Weak/absent peripheral pulse
- Cold extremities
- Capillary refill $>3s$
- AVPU $< A$
- Sunken eyes & skin pinch $\geq 2s$

Diarrhoea with severely impaired circulation= Hypovolaemic Shock

All of the features:



- Fast pulse (central)
- Weak/absent peripheral pulse
- Cold extremities
- Capillary refill >3s
- AVPU < A
- Sunken eyes & skin pinch ≥ 2 s

20 mls/kg Ringer's Lactate over 15 mins

Severe anaemia, respiratory distress and impaired circulation



If there is severe pallor and:

- *Respiratory distress (tachypnoea, acidotic breathing)*
- *+/- signs of impaired circulation*

GIVE OXYGEN

**10 mls/kg Packed Cells (or 20mls/kg Whole Blood)
start urgently, transfuse over 3-4 hours**

Limit other fluids to maintenance

Severe acute malnutrition with severely impaired circulation



All of the features:

- Fast pulse (central)
- Weak/absent peripheral pulse
- Cold extremities
- Capillary refill >3s
- Severe wasting / oedema

Severe acute malnutrition with severely impaired circulation



All of the features:

- Fast pulse (central)
- Weak/absent peripheral pulse
- Cold extremities
- Capillary refill >3s
- Severe wasting / oedema

20mls/Kg $\frac{1}{2}$ strength Ringers in 5% Dextrose
slowly over 2h
(fast boluses may do harm)

Other causes of severely impaired circulation

- Management according to specific treatment algorithms e.g. for dengue
- Specific management e.g. adrenaline / hydrocortisone for anaphylaxis
- More cautious fluids with reassessment
 - 20mls/kg over 2 hours is generally appropriate and can also be used in those with severe malnutrition – making the guidelines more consistent across diseases
 - Do not repeat – give maintenance fluids only

Severely impaired circulation, no
diarrhoea, no severe anaemia and
with or without severe malnutrition



If infant / child has **all of these:**

- Fast pulse (central)
- Weak/absent peripheral pulse
- Cold extremities
- Capillary refill >3s

Severely impaired circulation, no
diarrhoea, no severe anaemia and
without severe malnutrition



If infant / child has **all of these:**

- Fast pulse (central)
- Weak/absent peripheral pulse
- Cold extremities
- Capillary refill >3s

20 mls/kg Ringer' s Lactate **slowly**

(over 2 hours – fast boluses may do harm)

Use Ringers with Dextrose in severe malnutrition

Impaired circulation but not full shock (without diarrhea)

If infant / child has **some but not all of these:**

- Fast pulse (central)
- Weak/absent peripheral pulse
- Cold extremities
- Capillary refill >3s

Do not give bolus or extra fluids they cause harm – give only maintenance fluids / feeds

Fluid summary

- Fast bolus of 20mls/kg Ringers in 15 minutes is **only used** in diarrhoea complicated by severely impaired circulation (shock)
- Severe pallor (anaemia) with respiratory distress should be treated urgently with blood over 3 hours
- Be cautious if there is severely impaired circulation with severe acute malnutrition
 - 20mls/Kg ½ strength Ringers with 5% dextrose over 2 hrs
- Be cautious if there is severely impaired circulation but no history of diarrhoea and the child is febrile
 - 20mls/Kg Ringers over 2 hour

Fluid summary

- If signs suggest just some **impaired circulation (not full shock)** and if no diarrhoea then just give maintenance fluids
 - If diarrhoea and dehydration are present go on to Plan C

Coma, Confusion and Convulsions

How do we assess the level of consciousness?

Coma, Confusion and Convulsions

How do we assess the level of consciousness?

- Alert
- Voice
- Pain
- Unresponsive

Coma, Confusion and Convulsions

If the child is not fully alert AVPU<A or confused

- Check blood glucose

- If unable to check blood glucose give 10% dextrose

 - 5ml/kg intravenously or via intra-osseous

 - In young infants 2ml/kg (<2m old)

Manage convulsions

Give anticonvulsant and check sugar

How do we assess dehydration?

How do we assess dehydration

Assess and manage severe dehydration

- Lethargy (AVPU < A)
- Unable to drink / drinks poorly
- Sunken Eyes
- Skin pinch ≥ 2 secs

Plan C

Emergency treatments in a child who has a pulse and is breathing

- Airway: choking; **stridor**
- Breathing: oxygen occasionally **bronchodilators**
- Circulation; depends on the cause: **dengue**
- Coma and confusion: 10% glucose
- Convulsions: **anticonvulsants**
- Dehydration-- severe: **Plan C**

Questions?

ABCCD to prevent collapse

- Safe, stimulate, shout, setting
- Airway-- Look, clear if necessary, position
- Breathing-- BVM ventilation or oxygen?
- Circulation-- Fluids / blood according to the underlying problem
- Coma, confusion-- dextrose if not fully alert
- Convulsions-- if fitting now treat now
- Dehydration-- if severe also an emergency

Acknowledgements



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