

Manual for the health care of children in humanitarian emergencies

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Review of manual

This manual will be reviewed in 3 years i.e. by 2011. The use of the manual during this interim period will be closely monitored through partners and NGO's who will be responsible for directly implementing it. The experience will be used to improve the revised version.

Introduction

These guidelines are to assist in the care of children in emergencies. They are designed to serve as a reference manual for the evaluation and management of children in emergencies, and as the basis for the training of health care workers. The target audience is first level health workers who provide care to children under the age of 5 years. Physicians and health care workers with more advanced training are referred to the WHO Pocket Book of Hospital Care for Children: Guidelines for the Management of Common Illnesses with Limited Resources (2005).

These guidelines focus on care provided during the acute and chronic phases of an emergency. The acute phase of an emergency is defined by crude mortality rate and persists as long as the crude mortality rate is at least double the baseline mortality rate. This means as long as there are twice as many people dying per day compared to the normal rate of death. In sub-Saharan Africa, this threshold is set at one death per 10 000 persons per day.

These guidelines are designed for the care of children where no inpatient hospital facilities are available. It assumes that some injectable (intramuscular) and intravenous medicines can be given. If referral or hospital facilities are available, some of the treatment options in these guidelines may not be applicable and the child with severe illness is best referred to hospital.

These guidelines are designed to reduce child morbidity and mortality by addressing the major causes of child morbidity and mortality in emergencies. These causes are:

- diarrhoeal diseases
- acute respiratory tract infections
- measles
- malaria
- severe bacterial infections
- malnutrition and micronutrient deficiencies
- injuries
- burns
- poisoning.

The evaluation and management of these conditions is based upon Integrated Management of Childhood Illness (IMCI) guidelines (Box 1). However, this manual is different in that in addition to the IMCI conditions, these guidelines address emergency resuscitation, management of trauma and burns, care of the newborn and young infant, and evaluation of mental health and psychosocial support with clinical algorithms formatted in flow charts. The guidelines conclude with suggestions for integrating the prevention and care of children within the local context and broader health care delivery system.

The provision of care to children in emergencies requires more than just the health care worker. The following considerations are important.

- Involve the local community as much as possible. This will depend upon the type of emergency but the local community can be involved in surveillance for sick children and in the delivery of preventive health messages
- Ensure coordination of care across the different groups providing care to children. If possible, establish a referral centre for severely ill children.
- Establish a disease surveillance system so that outbreaks can be detected early, particularly for measles, dysentery, cholera and meningitis.
- Ensure quality of care through monitoring and quality assurance if possible. The following are critical elements:
 - standard diagnostic protocols
 - standard treatment protocols
 - essential drugs and quality control
 - staff training and monitoring.
- In the chronic emergency, begin planning for the transition to a sustainable health care system. The use of IMCI guidelines for the care of children should make this transition easier. Planning should include:
 - routine childhood immunizations
 - care of persons with tuberculosis
 - care of HIV-infected persons
 - provision of mental health and psychosocial support.

Adapting these guidelines to meet local needs

These guidelines need to be adapted to meet local needs based on the local disease burden. The local disease burden must be considered in caring for children in emergencies. Examples include the risk of:

- malaria
- meningococcal meningitis
- yellow fever
- haemorrhagic fevers
- typhoid fever
- leishmaniasis
- trypanosomiasis
- plague.

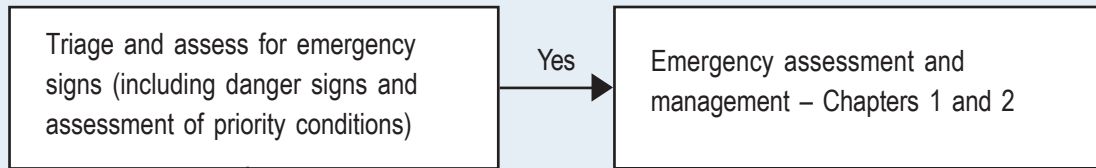
Coordination with Ministry of Health Guidelines

The Ministry of Health may have guidelines that are useful in the management of children in emergencies. Examples include:

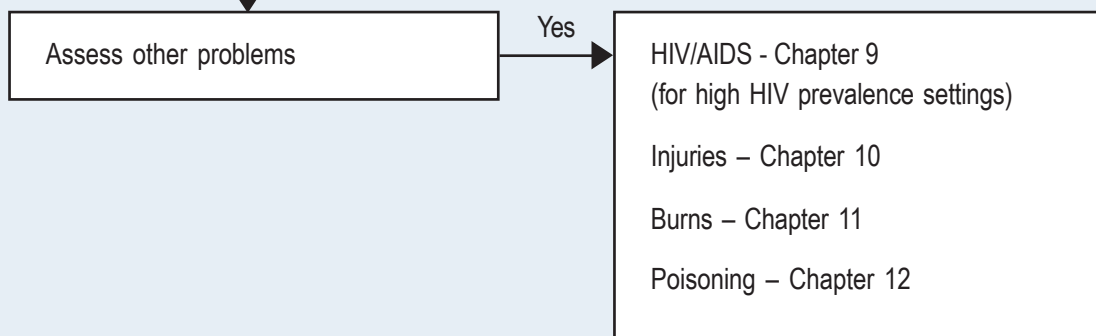
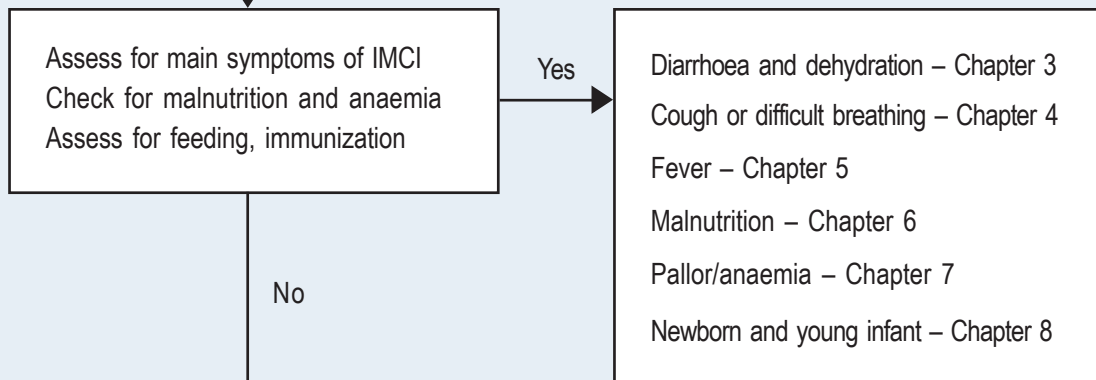
- First and second line drugs for the treatment of malaria
- Guidelines for the treatment of tuberculosis
- Guidelines for the prevention of mother-to-child HIV transmission.

Box 1: Structure showing linkages between chapters in the manual

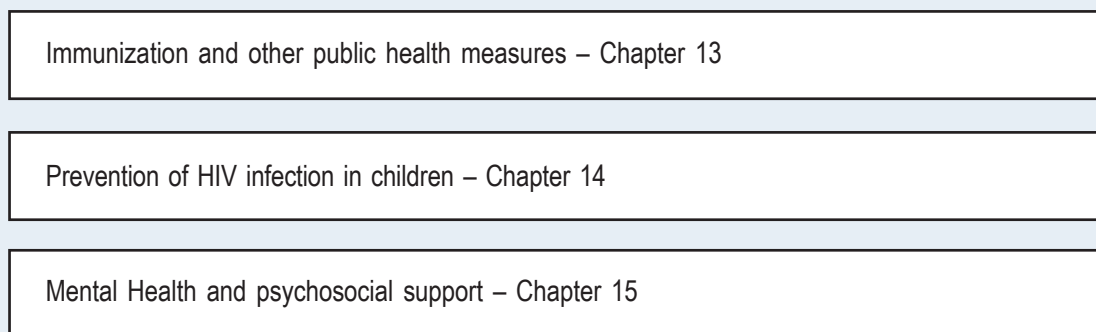
Module 1: Triage and emergency management



Module 2: Integrated management of childhood illness



Module 3: Prevention of child morbidity and mortality



Module 1

Triage and emergency management

Chapter 1: Triage and emergency assessment

Chapter 2: Management of emergency signs

Chapter 1

Triage and emergency assessment

Triage is the process of rapidly examining sick children when they first arrive in order to place them in one of the following categories:

- Those with EMERGENCY SIGNS who require immediate emergency treatment.
- Those with PRIORITY SIGNS who should be given priority in the queue so they can be rapidly assessed and treated without delay.
- Those who have no emergency or priority signs and are NON-URGENT cases. These children can wait their turn in the queue for assessment and treatment. The majority of sick children will be non-urgent and will not require emergency treatment.

Triage is the sorting of children into priority groups according to their medical need and the resources available.

After these steps are completed, proceed with a general assessment and further treatment according to the child's priority.

Ideally, all children should be checked on their arrival by a person who is trained to assess how ill they are. This person decides whether the child will be seen immediately and receive life-saving treatment, or will be seen soon, or can safely wait for his or her turn to be examined.

Categories after triage:

EMERGENCY CASES

PRIORITY CASES

QUEUE or NON-URGENT CASES

Action required:

Immediate treatment

Rapid attention

Wait turn in the queue.

The triaging process

Triaging should not take much time. In the child who does not have emergency signs, it takes on average twenty seconds.

- Assess several signs at the same time. A child who is smiling or crying does not have severe respiratory distress, shock or coma.
- Look at the child and observe the chest for breathing and priority signs such as severe malnutrition.
- Listen for abnormal sounds such as stridor or grunting.

When and where should triaging take place?

Triage should be carried out as soon as a sick child arrives, before any administrative procedure such as registration. This may require reorganizing the flow of patients in some locations.

Triage can be carried out in different locations, e.g. in the queue. Emergency treatment can be given wherever there is room for a bed or trolley for the sick child, enough space for the staff to work, and where appropriate drugs and supplies are accessible. If a child with emergency signs is identified in the queue, he or she must quickly be taken to a place where treatment can be provided immediately.

Who should triage?

All clinical staff involved in the care of sick children should be prepared to carry out rapid assessment to identify the few children who are severely ill and require emergency treatment.

How to triage?

Follow the ABCD steps:

- Airway
- Breathing
- Circulation/Coma/Convulsion
- Dehydration.

- A Airway**
- B Breathing**
- C Circulation/Coma/Convulsion**
- D Dehydration (severe)**

When ABCD has been completed the child should be assigned to one of:

- Emergency (E)
- Priority (P)
- Non-urgent and placed in the Queue (Q).

Emergency signs

Triage of patients involves looking for signs of serious illness or injury. These emergency signs are connected to the Airway - Breathing - Circulation/Consciousness - Dehydration and are easily remembered as ABCD. Each letter refers to an emergency sign which, when positive, should alert you to a child who is seriously ill and needs immediate assessment and treatment.

Assess airway and breathing

The most common cause of breathing problems in children during emergencies is pneumonia. However, other causes can also lead to breathing problems, including anemia, sepsis, shock and exposure to smoke. Obstructed breathing can be caused by infection (for example croup) or an object in the airway.

The child has an airway or breathing problem if any of these signs are present.

- Child is not breathing.
- Child has central cyanosis (bluish color).
- Severe respiratory distress with fast breathing or chest indrawing.

Assess for an airway or breathing problem.

- Is the child breathing?
- Is there central cyanosis?
- Is there severe respiratory distress?
- If there is severe respiratory distress, does breathing appear obstructed? The child with obstructed breathing will appear to have difficulty breathing with little air entering the lungs. Sometimes the child will make a sound (stridor) as some air moves past the obstruction.

Assessment of fast breathing.

- Count breaths FOR ONE FULL MINUTE to assess fast breathing.

If the child is:

Less than 2 months

2 months up to 12 months

12 months up to 5 years

The child has fast breathing if you count:

60 breaths per minute or more

50 breaths per minute or more

40 breaths per minute or more

- Look for chest indrawing.

Chest indrawing is the inward movement of the lower chest wall when the child breathes in and is a sign of respiratory distress. Chest indrawing does not refer to inward movement of the soft tissue between the ribs.

N.B. Refer to annex 1 for definition of technical terms.

For management of the child with airway or breathing problems, go to chapter 2.

Assess the circulation for signs of shock

Common causes of shock include dehydration from diarrhoea, sepsis, anaemia (for e.g. due to severe blood loss after trauma, poisoning or severe malaria).

The child has shock (a blood circulation problem) if the following signs are present:

- cold hands AND
- capillary refill longer than 3 seconds OR
- weak and fast pulse.

Capillary refill is the amount of time it takes for the pink colour to return after applying pressure to whiten the nail of the thumb or big toe for 3 seconds.

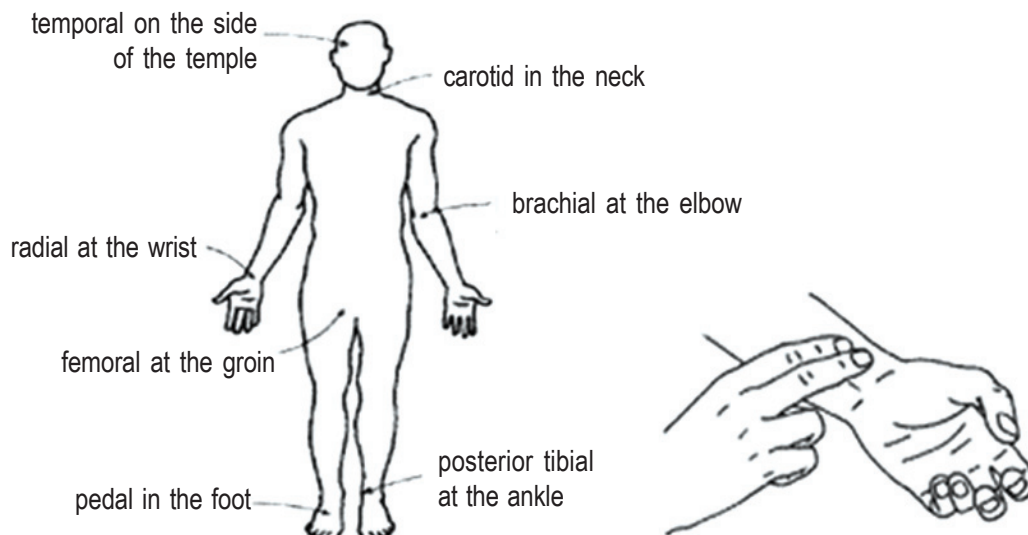
Assess the child's circulation.

- Is the child's hand cold?
- If yes, is the capillary refill longer than 3 seconds? Classify the child as having SHOCK if the capillary refill takes longer than 3 seconds.
- Check the pulse. Is the pulse weak and rapid?
 - To check the pulse, first feel for the radial pulse. If it is strong and not obviously rapid, the pulse is adequate. No further examination is needed.
 - If you cannot feel a radial pulse or if it feels weak, check a more central pulse.
 - In an infant (age less than one year), move up the forearm and try to feel the brachial pulse, or if the infant is lying down, feel for the femoral pulse.
 - If the more central pulse feels weak, decide if it also seems rapid.

Classify the child as having SHOCK if the pulse is weak and rapid.

For management of the shocked child, go to chapter 2.

Figure 1: Location of the major arteries to assess the pulse



Assess for convulsions¹ and coma

Common causes of convulsions in children include meningitis, cerebral malaria and head trauma.

Signs of convulsions include:

- sudden loss of consciousness
- uncontrolled, jerky movements of the limbs
- stiffening of the child's arms and legs
- unconscious during and after the convulsion.

For management of the convulsing child, go to chapter 2.

Common causes of loss of consciousness or lethargy or irritability and restlessness include meningitis, sepsis, dehydration, malaria, low blood sugar and severe anemia.

Assess the child for unconsciousness or lethargy.

- If the child is not awake and alert, try to rouse the child by talking to him or her.
- Then shake the arm to try to wake the child.
- If there is no response to shaking, squeeze the nail bed of a fingernail to cause mild pain.
- If the child does not respond to voice or shaking of the arm, the child is unconscious.

For management of the unconscious child, please go to chapter 2.

Assess the child for irritability or restlessness by looking for:

- difficulty in calming the child.
- persistent signs of discomfort or crying.
- continued, abnormal movement without periods of calm.

If you suspect trauma which might have affected the neck or spine, do not move the head or neck as you treat the child and continue the assessment.

- Ask if the child has had trauma to his head or neck, or a fall which could have damaged his spine.
- Look for bruises or other signs of head or neck trauma.

For more detailed assessment and management of the child with head or neck trauma, go to chapter 10.

¹ If a child convulses repeatedly, then the child may have epilepsy. Epilepsy is a condition characterized by *repeated* seizures. A seizure (also referred to as a convulsion, fit or attack) is a result of excessive nerve-cell discharges in the brain seen as sudden abnormal function of the body, often with loss of consciousness, an excess of muscular activity, or sometime a loss of it, or abnormal sensation. Such a child needs careful follow-up with an expert in hospital. Refer for assessment and follow-up care.

Causes of low blood glucose include sepsis, diarrhea, malaria and burns.

How to measure the blood glucose using a glucose strip:

- Put a drop of the child's blood on the strip.
- After 60 seconds, wash the blood off gently with drops of cold water.
- Compare the color with the key on the side of the bottle.
- If the blood glucose is less than 2.5 mmol/litre, the child has low blood glucose and needs treatment.

For management of the child with low blood glucose, go to chapter 2.

Assess for severe dehydration

Diarrhoea is one of the commonest causes of death among under-five children. Death most commonly is due to dehydration. Children with signs of severe dehydration (such as sunken eyes, severely reduced skin pinch, lethargy or unconsciousness, or inability to drink or breastfeed) need emergency management with replacement fluids.

For more detailed assessment and management of the child with severe dehydration, go to chapter 3.

Priority conditions

If the child does not have any emergency signs, the health worker proceeds to assess the child for priority conditions (box 2). This should not take more than few seconds. Some of these signs will have been noticed during the ABCD triage and others need to be rechecked.

Box 2: Priority conditions

- Tiny baby: any sick child aged under 2 months (Chapter 8)
- Temperature: child is very hot (Chapter 5)
- Trauma or other urgent surgical condition (Chapter 10)
- Pallor (severe) (Chapter 7)
- Poisoning (Chapter 12)
- Pain (severe): in a young infant this may be manifested with persistent, inconsolable crying or restlessness
- Lethargic or irritable and restless (Chapter 3)
- Respiratory distress (Chapter 4)
- Referral (urgent) - if a child is referred.
- Malnutrition: visible, severe wasting (Chapter 6)
- Oedema of both feet (swelling) (Chapter 6)
- Burns (Chapter 11)

Chapter 2

Management of emergency signs

Emergency management of airway and breathing problems

An airway or breathing problem is life-threatening. This child needs immediate treatment to improve or restore breathing.

- If the airway appears obstructed, open the airway by tilting the head back slightly.
- If the child may have a neck injury, do not tilt the head, but use the jaw thrust without head tilt (see Figure 2).
- Give oxygen if possible.
- Provide management for the underlying cause of airway or breathing problem
 - Cough (pneumonia) (see Module 2, Chapter 4)
 - Pallor (anemia) (see Module 2, Chapter 7)
 - Fever (malaria, meningitis, sepsis) (see Module 2, Chapter 5)
 - Shock (see below)
 - Poisoning (see Module 2, Chapter 12).

Figure 2: Jaw thrust without head tilt when trauma is suspected



Emergency management of the shocked child

A child who is in shock must be given intravenous (IV) fluids rapidly. A bolus (large volume) of fluid is pushed in rapidly in a child with shock who does not have severe malnutrition.

- Insert an intravenous (IV) catheter and begin giving fluids rapidly for shock. Normal (0.9%) saline or Ringer's lactate solution can be used for rapid fluid replacement. Give 20 mL/kg of fluid and reassess the signs of shock. 20 mL/kg boluses can be give two more times if signs of shock persist.
- If you are not able to insert a peripheral intravenous (IV) catheter after 3 attempts, insert a scalp intravenous (IV) catheter or intraosseous line.
- If the child has severe malnutrition, the fluid should be given more slowly and the child monitored very closely. Children with severe malnutrition can go into congestive heart failure from intravenous fluids.
- Apply pressure to stop any bleeding.
- Give oxygen if possible.

Emergency management of the unconscious child

Treatment of the unconscious child includes:

- management of the airway
- positioning the child (in case of trauma, stabilize neck first so that it does not move)
- giving intravenous (IV) glucose (see below)
- management of the underlying cause of loss of consciousness in children WITH fever:
 - malaria, meningitis, sepsis (see Module 2, Chapter 5)
- management of the underlying cause of loss of consciousness in children WITHOUT fever:
 - dehydration (see Module 2, Chapter 3)
 - anaemia (see Module 2, Chapter 7)
 - poisoning (see Module 2, Chapter 12).

Emergency management of the convulsing child

Treatment of the convulsing child includes the following steps:

- Ensure the mouth and airway are clear, but do not insert anything into the mouth to keep it open
- Turn the child on his or her side to avoid aspiration.
- Give intravenous (IV) glucose.
- Treat with diazepam or paraldehyde (phenobarbital for neonates)
 - Option 1: diazepam intravenously (IV) (0.3 mg/kg to a total dose of 10 mg) as slow infusion over 2 minutes
 - Option 2: diazepam rectally (0.5 mg/kg) administered by inserting a (1 mL) syringe without needle into the rectum
 - Option 3: paraldehyde (0.2 mL/kg to maximum of 10 mL) by deep intramuscular (IM) injection into the anterior (front) thigh
 - Option 4: paraldehyde rectally (0.4 mL/kg) administered by inserting a (1 mL) syringe without needle into the rectum
 - For neonates (< 1 month of age): Phenobarbital 20 mg/kg IV/IM. If convulsions continue, add 10 mg/kg after 30 minutes.
- If the child is conscious, feed the child frequently every 2 hours.

Management of the child with low blood sugar (glucose)

- If the child is unconscious, start an intravenous (IV) infusion of glucose solution
 - Once you are sure that the IV is running well, give 5 mL/kg of 10% glucose solution (D10) over a few minutes, or give 1 mL/kg of 50% glucose solution (D50) by very slow push.
 - Then insert a nasogastric tube and begin feeding every 2 hours.

Module 2

Integrated management of childhood illness in emergencies

Chapter 3: Diarrhoea and dehydration

Chapter 4: Cough or difficult breathing

Chapter 5: Fever

Chapter 6: Malnutrition

Chapter 7: Pallor/anaemia

Chapter 8: Newborn and young infant up to 2 months

Chapter 9: HIV/AIDS

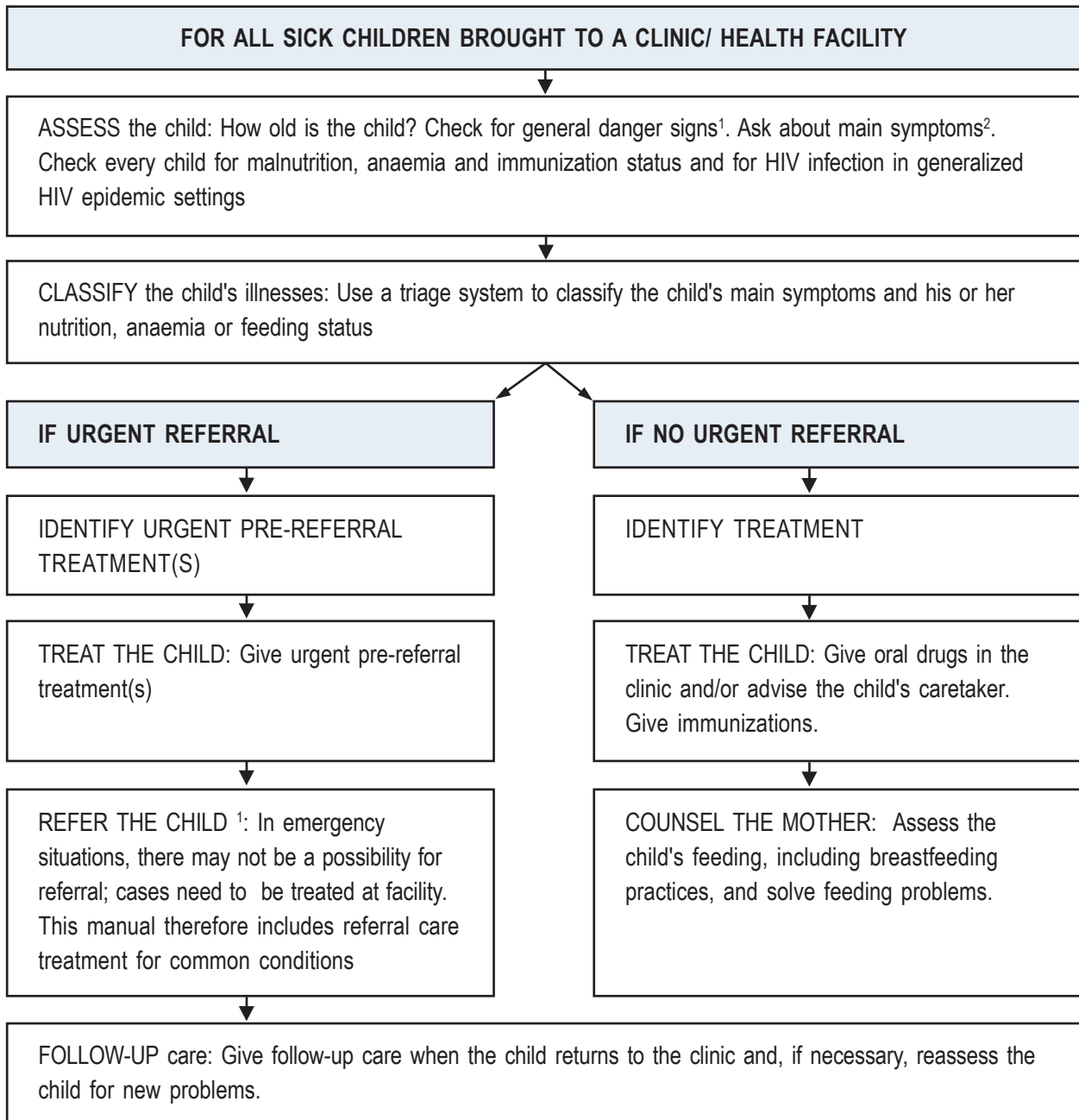
Chapter 10: Injuries

Chapter 11: Burns

Chapter 12: Poisoning

Summary of the integrated case management process

The core of the IMCI strategy is integrated case management of the most common childhood problems. Integrated case management relies on case detection using simple clinical signs and empirical treatment. As few clinical signs and laboratory tests as possible are used.



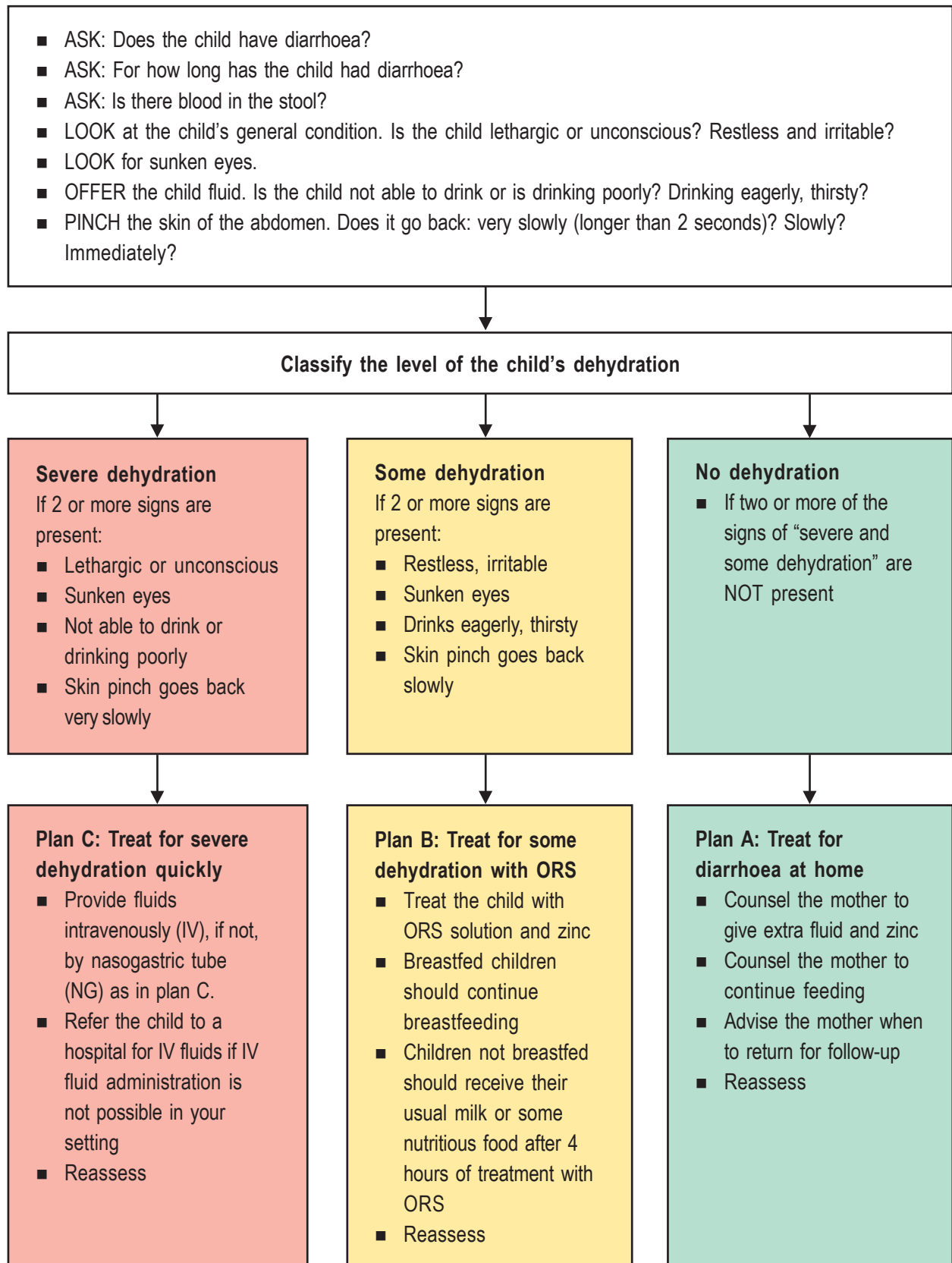
¹ General danger signs include convulsions, inability to drink or breastfeed, vomiting everything or lethargy or unconsciousness. Assessment and management of these conditions is dealt with in module 1.

² Main symptoms include diarrhoea, cough or difficult breathing, fever, malnutrition, anaemia and ear problems for which assessment and management are detailed in subsequent chapters

Chapter 3

Diarrhoea and dehydration

Assessment of the child with diarrhoea



Assess the child with diarrhoea for signs of dehydration

- ASK: For how long has the child had diarrhoea?
- ASK: Is there blood in the stool?
- LOOK at the child's general condition. Is the child lethargic or unconscious? Restless and irritable?
- LOOK for sunken eyes.
- OFFER the child fluid. Is the child not able to drink or drinking poorly? Drinking eagerly and thirsty?
- PINCH the skin of the abdomen. Does it go back: Very slowly (longer than 2 seconds)? Slowly?

Classify the child's level of dehydration

There are three possible classifications of dehydration:

- Severe dehydration
- Some dehydration
- No dehydration

Classify the child's dehydration:

- If two or more of the following signs are present, classify the child as having SEVERE DEHYDRATION.
 - Lethargic or unconscious
 - Sunken eyes
 - Not able to drink or drinking poorly
 - Skin pinch goes back very slowly (longer than 2 seconds)
- If two or more of these signs are present, classify the child as having SOME DEHYDRATION.
 - Restless, irritable
 - Sunken eyes
 - Drinks eagerly, thirsty
 - Skin pinch goes back slowly (less than 2 seconds but longer than normal)
- If two or more of the above signs are not present, classify the child as having NO DEHYDRATION.

Management of dehydration

Plan A: Treatment of 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:
 - Breastfeed frequently and for longer at each feed.
 - If the child is exclusively breastfed, give ORS or clean water in addition to breast milk.
 - If the child is not exclusively breastfed, give one or more of the following: food-based fluids (such as soup, rice water, and yoghurt drinks) or ORS.
- It is especially important to give ORS at home when:
 - the child has been treated with Plan B or Plan C during this visit
 - the child cannot return to a clinic if the diarrhoea gets worse.
- 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:
 - 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 (20 mg tablets) to give
 - Up to 6 months: 1/2 tablet daily for 14 days
 - 6 months or more: 1 tablet daily for 14 days
- Show the mother how to give zinc supplements
 - Infants: dissolve tablet in a small amount of expressed breast milk, ORS or clean water in a cup
 - Older children: tablets can be chewed or dissolved in a small amount of clean water in a cup

3. Continue feeding

4. When to return

- Advise the mother to return immediately with the child if the child develops any danger sign (lethargy, unconsciousness, convulsions, inability to eat or drink)
- Follow up in 5 days if there is no improvement.

1. Give extra fluid
2. Give zinc supplements
3. Continue feeding
4. When to return

Plan B: Treatment for some dehydration with ORS

Give recommended amounts of ORS over a 4 hour period

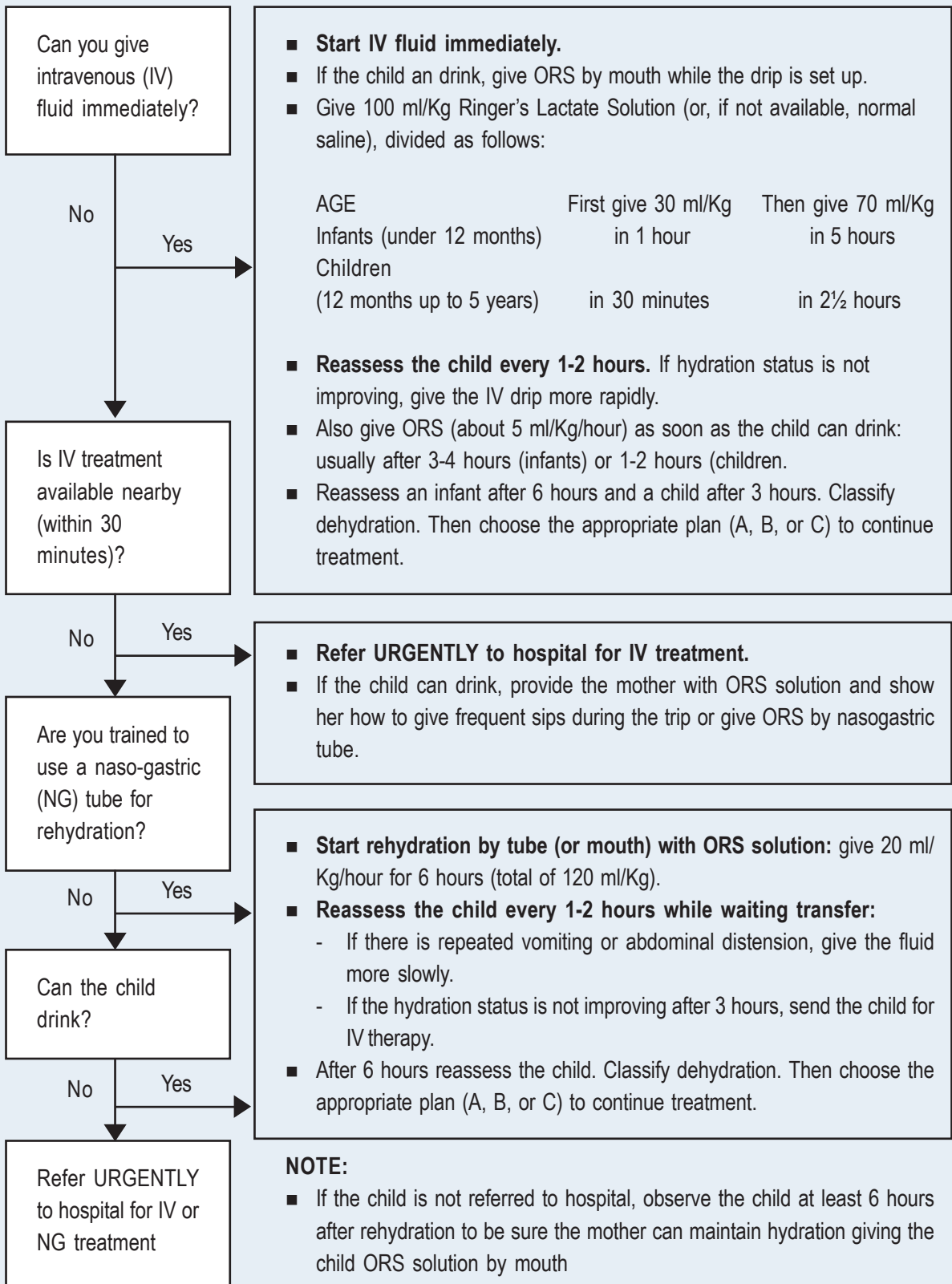
- Determine amount of ORS to give during first 4 hours

Age	Up to 4 months	4 up to 12 months	12 months up to 2 years	2 years up to 5 years
Weight	<4 kg	6 -<10 kg	10-<12 kg	12-<20kg
Fluid in ML	200–450	450–800	800–960	960–1600

- 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 times 75.
 - If the child wants more ORS than shown, give more.
 - For infants below 6 months who are not breastfed, also give 100–200ml clean water during this period.
- 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 whenever the child wants.
 - After 4 hours
 - Reassess the child and classify the child for dehydration.
 - Select the appropriate plan to continue treatment.
 - Begin feeding the child in clinic.
 - If the mother must leave before completing treatment
 - Show her how to prepare ORS solution at home.
 - Show her how much ORS to give to finish 4-hour treatment.
 - Explain the 4 Rules of home treatment.
 1. Give extra fluid
 2. Give zinc supplements
 3. Continue feeding
 4. When to return
 - Advise the mother to return immediately with the child if the child develops any danger sign (lethargy, unconsciousness, convulsions, inability to eat or drink).
 - Follow-up in 5 days if not improving.

Plan C: Treat for severe dehydration quickly

FOLLOW THE ARROW, IF ANSWER IS "YES", GO ACROSS, If "NO", GO DOWN



Types of diarrhoea

Diarrhoea could be:

- acute diarrhoea (including cholera)
- persistent diarrhoea (diarrhoea for 14 days or more)
- severe persistent diarrhoea (persistent diarrhoea with some or severe dehydration)
- dysentery (blood in the stool)

Classify the child with PERSISTENT DIARRHOEA if the child has had diarrhoea for 14 days or more.

Classify the child with SEVERE PERSISTENT DIARRHOEA if the child had diarrhoea for 14 days or more and the child has some or severe dehydration.

Classify the child as having DYSENTERY if the child has diarrhoea and blood in the stool.

Classify the child as having CHOLERA if it is known that there is an on-going cholera epidemic in the area and the child has watery diarrhoea.

Cholera should be suspected when a child older than 5 years or an adult develops severe dehydration from acute watery diarrhoea, or when any patient older than 2 years has acute watery diarrhoea when cholera is known to be occurring in the area. Younger children also can develop cholera but the illness may be difficult to distinguish from other causes of acute watery diarrhoea.

Management of the child with diarrhoea

A child with PERSISTENT or SEVERE PERSISTENT DIARRHOEA needs both fluid and nutrition.

- Treat dehydration as per plan A, B or C depending on the level of dehydration.
- Advise mother on how to feed her child.
- Give multivitamin supplement every day for 2 weeks if possible.
- Identify and treat infections (See Module 2, Chapters 4 and 5).
- Do not give antibiotics to children with diarrhoea unless they have dysentery or severe cholera.
- Monitor the child's feeding and treatments and the child's response (e.g. weight gain).

A child with DYSENTERY¹ needs antibiotics and fluid.

- Administer antibiotics for possible shigella infection.
 - Oral ciprofloxacin (15 mg/kg) twice a day for 3 days

¹ In some countries, the major cause of dysentery might be amoebic dysentery. In this case, you need to use metronidazole.

Size of tablet 2 times a day for 3 days:

Tablets	< 1 year	1-4 years	5-15 years
500 mg	¼ tablet	½ tablet	1 tablet
250 mg	½ tablet	1 tablet	2 tablets

Some strains of shigella are resistant to antibiotics. Alternative drugs for multi-resistant strains of shigella are:

- IM ceftriaxone (50–100 mg/kg) once a day for 2–5 days
 - Oral pivmecillinam (20 mg/kg; maximum 300 mg) four times a day for 5 days.
- Treat dehydration as above.
 - Administer zinc
 - for children less than 6 months: 10 mg/day for 14 days
 - for children 6 months or older: 20 mg/day for 14 days.

A child with CHOLERA needs fluid. Fluid replacement is the mainstay of cholera management. Antibiotics can be administered in addition to fluids if the cholera is severe.

- Treat dehydration as above.
- A child with cholera can lose fluids very quickly and may need an IV for fluid management.
- Administer antibiotics to children with severe cholera. It is important to perform antibiotic sensitivity testing prior to treatment. The following antibiotics may be effective:
 - doxycycline
 - oral tetracycline
 - oral cotrimoxazole
 - oral erythromycin
 - oral furazolidone.

Chapter 4

Cough or difficult breathing

Assessment of the child with cough or difficult breathing

- ASK: Does child have cough or difficult breathing?
- ASK: For how long has the child had cough or difficult breathing?
- COUNT the breaths in one minute

If the child is 2 to 12 months,
50 breaths per minute or more is fast

If the child is 12 months to 5 years,
40 breaths per minute or more is fast

- LOOK for chest indrawing
- LOOK and LISTEN for stridor or wheeze

Classification of the child with cough or difficult breathing

Severe pneumonia

- Cough or difficult breathing with or without fast breathing AND
- Chest indrawing OR
- Danger signs such as lethargy or unconsciousness, convulsions, or inability to eat or drink OR
- Stridor in calm child

Managing child with severe pneumonia

- If possible, refer to hospital
- Give fluids
- Give oxygen if available
- Antibiotics
- Bronchodilator (salbutamol) if the child is wheezing
- Paracetamol every 6 hours if the child has a fever
- Keep infant warm, dry and well wrapped

Pneumonia

- Cough or difficult breathing AND
- Fast breathing

Managing child with pneumonia

- Administer oral amoxicillin
- Teach the mother to give the antibiotic
- Encourage the child to eat and drink
- Encourage mother to continue breastfeeding

Cough or cold

- Cough but NOT fast breathing, chest indrawing and no danger sign

Managing child with cough or cold

- Teach the mother to soothe the throat and relieve the cough with safe remedy (warm tea with sugar)
- Advise mother to watch for fast or difficult breathing. She should return immediately if it develops.
- If cough or difficult breathing more than 2 weeks, refer for possible tuberculosis or asthma assessment and management

Assess the child for acute respiratory tract infection (cough or difficult breathing)

- ASK: Does the child have cough or difficult breathing?
- ASK: For how long has the child had cough or difficult breathing?
- COUNT the breaths in one minute.

If the child is:

2 months up to 12 months

12 months up to 5 years

The child has fast breathing if you count:

50 breaths per minute or more

40 breaths per minute or more.

- LOOK for chest indrawing.
- LOOK and LISTEN for stridor or wheeze, a sign of airway obstruction

Chest indrawing is the inward movement of the lower chest wall when the child breathes in, and is a sign of respiratory distress. Chest indrawing does not refer to the inward movement of the soft tissue between the ribs.

Stridor is a harsh noise heard when a sick child breathes in. Stridor is usually caused by a viral infection (croup) which causes swelling in the child's upper airway. Another cause of stridor is diphtheria, a bacterial infection preventable by vaccination. Stridor may also be caused by an object in the upper airway.

Wheeze is a high-pitched whistling sound near the end of expiration. It is caused by narrowing of the small air passages of the lung. To hear a wheeze, place the ear next to the child's mouth and listen to the breathing while the child is calm, or use a stethoscope to listen for wheezes.

Some signs of diphtheria:

- Look at the child's nose and throat very carefully without distressing the child. If there is a grey, adherent membrane which cannot be wiped off with a swab, this is probably diphtheria.
- Look at the child's neck. If it is swollen ("bull neck") on one side this also suggests diphtheria.

Classify the child with cough or difficult breathing

There are three possible classifications for a child with cough or difficult breathing:

- severe pneumonia
- pneumonia
- cough or cold (without pneumonia)

- Classify the child with SEVERE PNEUMONIA if the child has fast breathing and:
 - General danger signs such as lethargy, unconsciousness or convulsions, or is unable to eat or drink, or stridor
 - Chest indrawing.
- Classify the child with PNEUMONIA if the child does not have the above signs but the child has:
 - Fast breathing.
- Classify the child as having COUGH OR COLD if the child does not have fast breathing but has a cough.
- Child as having CHRONIC COUGH if the child has had:
 - Cough for 3 weeks or longer. This child may have tuberculosis or asthma or whooping cough.

Management of the child with cough or difficult breathing

Treat pneumonia

The child with SEVERE PNEUMONIA needs urgent care.

- If possible, refer the child with SEVERE PNEUMONIA to a hospital for care.
- Administer antibiotics for a total of 10 days.
 - intramuscular gentamicin and ampicillin or
 - intramuscular chloramphenicol or
 - intramuscular benzylpenicillin or ampicillin or
 - change to oral chloramphenicol when child improves.
- Administer oxygen if possible.
- Give a bronchodilator (salbutamol) if the child is wheezing.
- Give paracetamol every 6 hours if the child has fever (axillary temperature of 38.5°C or above).
- Manage the airway by clearing a blocked nose with a plastic syringe (without the needle) to gently suck secretions from the nose.
- If the child can drink, give fluids by mouth, but cautiously to avoid fluid overload.
- Encourage the mother to continue breastfeeding if the child is not in respiratory distress.
 - If the child is too ill to breastfeed but can swallow, have the mother express milk into a cup and slowly feed the child the breast milk with a spoon.
- If the child is not able to drink, either use a dropper to give the child fluid very slowly or drip fluid from a cup or a syringe without a needle. Avoid using a nasogastric (NG) tube if the child is in respiratory distress.
- Keep the infant warm. Keep the sick infant dry and well wrapped. If possible, have the mother keep her infant next to her body, ideally between her breasts. A hat or bonnet will prevent heat loss from the head.

The child with non-severe PNEUMONIA needs antibiotics but can be managed at home.

- Administer an oral antibiotic.
 - The preferred treatment is oral amoxicillin (25 mg/kg/dose) 2 times a day for 3 days.
 - An alternative treatment is oral chloramphenicol (50 mg/kg) in 3 divided doses per day.
 - The duration of treatment should be extended to 5 days in high HIV prevalence settings.
- Show the mother how to give the antibiotic.
- Encourage the child to eat and drink.
- Encourage the mother to continue breastfeeding the child.
- Advise the mother to return with the child immediately if the child's breathing worsens or the child develops any danger sign.
- Follow up in 2 days.

The child with COUGH or COLD (no pneumonia) does not need antibiotics.

- Teach the mother to soothe the throat and relieve the cough with a safe remedy such as warm tea with sugar.
- Advise the mother to watch for fast or difficult breathing and to return if either one develops.
- Follow up in 5 days if there is no improvement.

Treat wheezing

Give inhaled bronchodilator using a spacer.

- A spacer is a way of delivering the bronchodilator drugs effectively into the lungs. No child under 5 years should be given an inhaler without a spacer. A spacer works as well as a nebuliser if correctly used.
- From salbutamol metered dose inhaler (100ug/puff) give 2 puffs.
 - Repeat up to 3 times every 15 minutes before classifying pneumonia.

Spacers can be made in the following way:

- Use a 500ml drink bottle or similar.
- Cut a hole in the bottle base in the same shape as the mouthpiece of the inhaler. This can be done using a sharp knife.
- Cut the bottle between the upper quarter and the lower 3/4 and discard the upper quarter of the bottle.
- Cut a small V in the border of the large open part of the bottle to fit to the child's nose and be used as a mask.
- Flame the edge of the cut bottle with a candle or a lighter to soften it.

In a small baby, a mask can be made by making a similar hole in a plastic (not polystyrene) cup. Alternatively commercial spacers can be used if available.

To use an inhaler with a spacer:

- Remove the inhaler cap. Shake the inhaler well.
- Insert mouthpiece of the inhaler through the hole in the bottle or plastic cup.
- The child should put the opening of the bottle into his mouth and breathe in and out through the mouth.
- A carer then presses down the inhaler and sprays into the bottle while the child continues to breathe normally.
- Wait for three to four breaths and repeat for total of five sprays.
- For younger children place the cup over the child's mouth and use as a spacer in the same way.

N.B. If a spacer is being used for the first time, it should be primed by 4-5 extra puffs from the inhaler.

Treat stridor

- Give oxygen if possible
- Give one dose of oral corticosteroid
- If diphtheria: give procaine penicillin and diphtheria antitoxin IM

Treat STRIDOR as severe:

- If stridor is present when the child is breathing quietly (not crying)
- Give oxygen using nasal prongs if possible. Continue oxygen therapy until the lower chest wall indrawing is no longer present.
- Steroid treatment: give one dose of oral dexamethasone (0.6 mg/kg).
- If the child has severe chest indrawing, refer the child.

If DIPHTHERIA is the cause of stridor:

- Give IM procaine penicillin (50 000 units/kg) daily for 7 days.
- Give 40 000 units of diphtheria antitoxin IM immediately. As there is risk for a serious allergic reaction, an initial intradermal test should be done to check for hypersensitivity.
- If the child is in severe distress, consider referral if possible as the child might need a tracheotomy (a hole in the front of the neck into the windpipe to allow air entry to lungs).
- Check on the child every few hours. Anyone caring for the child should have been immunized against diphtheria.
- Give all unimmunized household contacts of the child one IM dose of benzathine penicillin (600 000 units if 5 years or younger; 1 200 000 units to persons over age 5 years) and immunize them with diphtheria toxoid.
- Give all immunized household contacts a diphtheria toxoid booster.
- A child who has had diphtheria may have complications of the heart (myocarditis) or paralysis 2–7 weeks after the initial infection.
- Manage the child as MILD STRIDOR if child has a hoarse voice and stridor is only heard when the child is agitated or crying. Manage child at home with supportive care, encouraging oral fluids, breastfeeding or feeding. Give paracetamol if child has a fever. Advise the mother to return immediately with the child if the child's breathing worsens or the child develops any danger sign.

Treat the child with cough or difficult breathing for more than 2 weeks

The child with COUGH for more than 2 weeks needs evaluation for possible asthma or tuberculosis.

Managing the child with cough for more than 2 weeks:

- Evaluate for asthma and TB
- Give first-line antibiotic for pneumonia for 5 days if child was not recently treated with antibiotics for pneumonia
- Give salbutamol for 14 days if child is wheezing or coughing at night
- Weigh child to assess for weight loss
- Ask about TB or chronic cough in the family
- See the child in 2 weeks
- If there is no response to above treatment or child is losing weight, obtain an X-ray of the chest to check for signs of TB.
- If an X-Ray is not available, a clinician can make the decision to begin treatment for TB based on high index of suspicion (see below)

Approach to diagnosis of TB in children:

- The commonest type of TB in children is extrapulmonary TB, mainly intrathoracic. Other forms include TB lymphadenopathy, TB meningitis, TB effusions (pleural, pericardial, peritoneal) and spinal TB.
- The diagnosis of pulmonary TB in children is difficult. Most children with pulmonary TB are too young to produce sputum for smear microscopy.
- Important features of pulmonary TB include:
 - Contact with a smear-positive pulmonary case;
 - Respiratory symptoms for more than 2 weeks, not responding to broad-spectrum antibiotics;
 - Weight loss or failure to thrive especially when not response to therapeutic feeding programme.
- Positive test to the standard dose of tuberculin (2 units tuberculin (TU) or RT23 or 5 TU of PPD-S: 10 mm or more in unvaccinated children, 15mm or more in BCG-vaccinated children. However, with severe TB and/or advanced immunosuppression, the TST may be negative.
- Chest X-ray findings are often not specific, however become more valuable if there has been a history of close contact with a diagnosed pulmonary TB case.

Chapter 5

Fever

For ALL sick children ask the mother about the child's problem, check for general danger signs, ask about cough or difficult breathing, diarrhoea. Then:

ASK: DOES THE CHILD HAVE FEVER? (by history, or child feels hot, or axillary temperature is 37.5° Celsius or above)

If YES: Decide the Malaria Risk: high or low

THEN ASK: For how long? If more than 7 days has fever been present every day? If yes, think of persistent fever due to typhoid fever or tuberculosis.

A child with fever is likely to have **malaria** in high malaria risk areas (see page 29).

A child with fever may have **measles** if the child has a history of measles within the last 3 months, or if fever is associated with generalized rash or runny nose, or cough or red eyes now (see page 38).

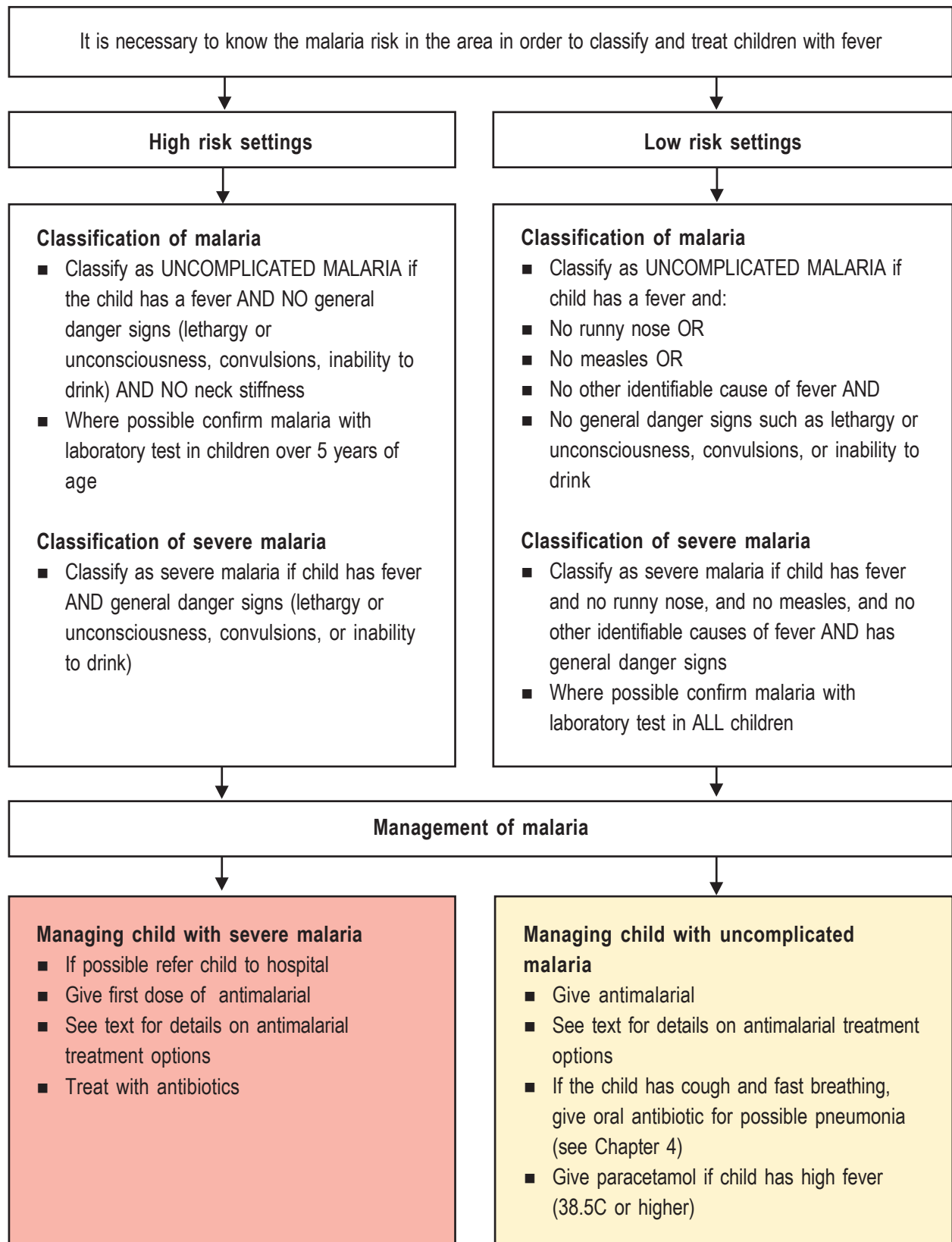
If the child with fever has general danger signs (such as lethargy or unconsciousness, convulsions or inability to drink), consider **sepsis**, or if the child has neck stiffness, consider **meningitis** (see **severe febrile disease** page 41). A child with sepsis and meningitis may also have severe malaria in high malaria risk areas.

If a child has ear pain or discharge, with or without fever, consider an **ear problem** (see page 42).

If a child has a fever and skin lesions, he may have a **local bacterial infection** or **abscess** (see page 43).

Assessment and management of these conditions is described in subsequent sections.

Assessment of the child with malaria



Assess the child with malaria

To classify and treat children with fever, you must know the malaria risk in your area.

- High malaria risk = more than 5% of the fever cases in children is due to malaria
- Low malaria risk = 5% or less of the fever cases in children is due to malaria

If there is no information stating risk is low, assume that it is HIGH.

Note that the risk of malaria may be seasonal. If you do not have information telling you that the malaria risk is low, always assume that children under 5 who have fever are at high risk for malaria.

Classify the child with malaria

If the risk of malaria is HIGH:

- Classify as UNCOMPLICATED MALARIA if the child has a fever AND no general danger signs such as lethargy or unconsciousness, convulsions, or inability to drink.
- Classify as SEVERE MALARIA if child has fever AND general danger signs.
- Where possible confirm malaria with laboratory test in children over 5 years of age.
- Children who are severely ill, in shock, or unconscious must also be treated with antibiotics in addition to antimalarials.

If the risk of malaria is LOW:

- Classify as UNCOMPLICATED MALARIA if the child has a fever and:
 - No runny nose¹
 - No measles¹
 - No other identifiable cause of fever
 - No general danger signs such as lethargy or unconsciousness, convulsions, or inability to drink
- Classify as SEVERE MALARIA if child has fever and no runny nose, and no measles, and no other identifiable causes of fever AND has general danger signs.
- Where possible confirm malaria with laboratory test in all children.
- Children who are severely ill or shocked, or unconscious, must also be treated with antibiotics in addition to antimalarials.

¹ These other findings do not exclude the diagnosis of malaria, but make the diagnosis of malaria less likely.

Laboratory confirmation of malaria

Malaria can be confirmed by examination of thick and thin blood smears or rapid diagnostic tests (RDTs). However, there are limitations to the use of both blood smears and RDTs for the diagnosis of malaria.

Laboratory confirmation is needed for:

- Children with suspected malaria in areas of low malaria risk
- Children aged 5 years and over with suspected malaria in areas of high malaria risk.

Laboratory confirmation is not strictly needed for:

- Children under 5 years of age with suspected malaria in high malaria risk areas. These children can be treated on the basis of clinical diagnosis (fever) alone. However, a child's illness may commonly have more than one cause and fever does not necessarily mean malaria, even in high malaria risk areas.
- Every child with fever once malaria has been established as the cause of an ongoing epidemic with large numbers of cases that overwhelm the ability to confirm cases by laboratory tests.

There are two options for confirming the diagnosis of malaria:

- light microscopy
- rapid diagnostic tests (RDTs).

When to use microscopy

Routine confirmatory diagnosis and patient management.

- Microscopy services, including training and supervision, should be re-established as an emergency situation stabilizes and used for routine confirmation of malaria and for management of severe malaria.

Investigation of suspected treatment failures.

- Microscopic examination of thick and thin peripheral blood films should be carried out to confirm all cases of suspected treatment failure.

Quality control system for rapid diagnostic tests.

- Microscopy is the "gold standard" and the most commonly used laboratory diagnostic tool in malaria-endemic regions. Microscopy should be used to assess the accuracy of RDTs.

When to use RDTs

Confirmatory diagnosis of suspected malaria cases.

- Provided they are of assured quality, RDTs can be used in low malaria risk areas where skilled microscopy is not available
- In high malaria risk settings, RDTs may be used for confirmation of severe malaria until the situation is stabilized and good-quality microscopy services are established. They can also be used when it is impossible to establish or maintain effective microscopy services.

Rapid malaria assessments.

- RDTs are particularly useful for screening large numbers of children for malaria.

Malaria epidemics.

- In epidemic situations, where the number of cases of children with fever is very high, RDTs can enable a team of two people to accurately screen up to 200 children per day. Where this is not possible, because of shortages of either staff or RDTs, clinical diagnosis may be the only option.

When not to use RDTs

- RDTs may continue to produce positive test results for up to 14 days after effective treatment of a malaria infection, even though patients no longer have detectable parasites on microscopy.
- These tests should therefore not be used for *investigation of suspected treatment failures*. Microscopy should be used to confirm treatment failure.
- When microscopy is not possible, the decision to give further antimalarial treatment relies upon the history of first-line treatment.

Management of the child with malaria

Give supportive and ancillary treatment for patients with severe malaria

- Clear the airway and check that the child is breathing (see Module 1, Chapter 2)
- Establish intravenous (IV) access.
- Treat convulsions lasting 5 minutes or more (see Module 1, Chapter 2).
- Take blood for assessment of malaria parasites, blood glucose and haemoglobin if possible.
- Treat hypoglycaemia (blood glucose <2.2 mmol/l) (see Module 1, Chapter 2).
- Rapidly assess circulation, hydration and nutritional status, and resuscitate if necessary with normal (0.9%) saline (see Module 1, Chapters 1 and 2).
- If haemoglobin is <5 g/dl and child has respiratory distress, transfuse blood if possible (see Module 2, Chapter 7).

- For unconscious patients, insert a nasogastric tube and aspirate stomach contents to prevent aspiration pneumonia. Perform a lumbar puncture, if possible, to exclude meningitis.
- Start antimalarial drug treatment urgently (see below).
- Start antibiotic therapy (see below).

Antimalarials for treatment of severe malaria

Option 1: Artemisinin derivatives

- Artemether IM
 - Loading dose (3.2 mg/kg) intramuscularly (IM) as single dose on day 1
 - Maintenance dose (1.6 mg/kg) intramuscularly (IM) until the child able to take oral antimalarial therapy
- Artesunate IV or IM
 - Loading dose (2.4 mg/kg) intravenously (IV) over 3 minutes as a single dose on day 1 at 0, 12 and 24 hours
 - Maintenance dose (2.4 mg/kg) over 3 minutes beginning on day 2 once a day until the child is able to take oral antimalarial therapy
- Rectal artesunate only if IV or IM therapy not possible
 - Give 10 mg/kg of artesunate by rectal suppository
 - Repeat dose if expelled within one hour
 - Repeat dose after 24 hours if referral not possible

Artesunate suppositories remain stable in temperatures of up to 40 °C and therefore require cool – but not cold – transport and storage.

Dose of rectal artesunate treatment in children aged 2–15 years and weighing at least 5kg:

Weight (kg)	Age	Artesunate dose (mg)	Regimen (single dose)
5–8.9	0–12 months	50	One 50mg suppository
9–19	13–42 months	100	One 100mg suppository
20–29	43–60 months	200	Two 100mg suppositories
30–39	6–13 years	300	Three 100mg suppositories
>40	>14 years	400	One 400mg suppository

Changing to oral treatment after treatment with intravenous or intramuscular artemisinin derivatives

Complete the treatment with a full course of ACT.

- Artemether-lumefantrine (Coartem®) for 3 days is the best option.

Option 2: Quinine dihydrochloride IV

- If above drugs are not available, give quinine dihydrochloride intravenously (IV)
 - loading dose (20 mg salt/kg) intravenously (IV) over 4 hours, diluted in 5-10% glucose or normal (0.9%) saline to a total volume of 10 ml/kg
 - maintenance dose (10 mg salt/kg) IV every 8 hours, diluted in 5-10% glucose or normal (0.9%) saline to a total volume of 10 ml/kg
 - monitor for low blood sugar every 4 hours after each infusion of loading or maintenance dose
- If IV quinine is needed for more than 48 hours, reduce the maintenance dose to 7 mg salt/kg
- A minimum of 3 doses of intravenous (IV) quinine should be given before changing to oral therapy
- Volume of infusion:
 - Quinine can be diluted in 5% glucose, 10% glucose, 4% glucose– 0.18% saline, or normal (0.9%) saline.
 - Dilute quinine to a total volume of 10 ml/kg (the same volume is used for both loading and maintenance doses) and infuse over 4 hours.
 - To avoid overloading the child with intravenous (IV) fluids, the volume of the quinine infusion *must* be taken into account when calculating the total 24-hour fluid requirement.

Changing to oral treatment following intravenous (IV) or intramuscular (IM) quinine

Options for oral treatment following parenteral quinine are:

- Artemether-lumefantrine (Coartem®) for 3 days OR
- Oral quinine 10 mg salt/kg every 8 hours to complete the remainder of a total of 7 days of quinine treatment.
- In areas of multidrug-resistant malaria, quinine should be combined with oral clindamycin, 5 mg/kg 3 times a day for 7 days.
- Mefloquine should be avoided in children recovering from coma as it increases the risk of neuropsychiatric complications.

Antibiotics in management of severe malaria

Children with severe malaria should be treated with broad-spectrum antibiotics intravenously (IV) in the following circumstances:

- Severely ill despite resuscitation or shocked
- Unconscious patients.

The recommended antibiotic regimen is:

- Ampicillin (50 mg/kg 6-hourly) plus gentamicin (7.5mg once per day)
- If it is not possible to do a lumbar puncture in an unconscious child with malaria, or if the CSF findings are suggestive of meningitis, start presumptive IV treatment for meningitis (e.g. benzylpenicillin 60mg/kg 6-hourly plus chloranphenicol 25mg/kg 6-hourly) (see Module 2, Chapter 5, section on severe febrile diseases).

Blood transfusion for severe anaemia

See Module 2, Chapter 7.

Management of the child with uncomplicated falciparum malaria

Children with uncomplicated falciparum malaria can be treated with fixed or non-fixed artemisinin combination therapy (ACT) regimens. Fixed ACT regimens are preferred.

- **Option 1:** Fixed ACT treatment (two drugs in single tablet)
 - arthemether-lumefantrine (Coartem®)
 - artesunate plus mefloquine
 - artesunate plus amodiaquine

Dosage schedules for artemether–lumefantrine:

Weight(Approx. age)	Number of tablets at approximate timing (hours) of dosing					
	0 h	8 h	24 h	36 h	48 h	60 h
5–14 kg (<3 years)	1	1	1	1	1	1
15–24 kg (>3–8 years)	2	2	2	2	2	2
25–34 kg (>9–13 years)	3	3	3	3	3	3
>34kg (>14 years)	4	4	4	4	4	4

■ **Option 2: Non-fixed ACT**

- artesunate (4 mg/kg once a day for 3 days) plus mefloquine (25 mg/kg mefloquine base given as a split dose on the second and third day)
- artesunate (4 mg/kg once a day for 3 days) plus SP (sulfadoxine 25 mg/kg and pyrimethamine 1.25 mg/kg, as a single dose on day 1) in areas where the cure rate of SP is greater than 80%
- artesunate (4 mg/kg once a day for 3 days) plus amodiaquine (10 mg base/kg daily for 3 days) in areas where the cure rate of amodiaquine monotherapy is greater than 80%.

Dosage schedules for artesunate + mefloquine:

Age	Number of artesunate tablets (50mg) per day			Number of mefloquine tablets (250mg base) per day		
	Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
5-11 months	½	½	½	-	½	-
>1-6 years	1	1	1	-	1	-
>7-12 years	2	2	2	-	2	1
>13 years	4	4	4	-	4	2

Dosage schedules for artesunate + SP:

Age	Number of artesunate tablets (50mg) per day			Number of SP tablets (25mg S + 500mg P base) per day		
	Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
5-11 months	½	½	½	½	-	-
>1-6 years	1	1	1	1	-	-
>7-12 years	2	2	2	2	-	-
>13 years	4	4	4	3	-	-

Dosage schedules for artesunate + amodiaquine:

Age	Artesunate tablet (50mg)			Amodiaquine tablets (153mg base)		
	Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
5-11 months	½	½	½	½	½	½
>1-6 years	1	1	1	1	1	1
>7-12 years	2	2	2	2	2	2
>13 years	4	4	4	4	4	4

- If the child also has cough and fast breathing, give the child an oral antibiotic for possible pneumonia (see Module 2, Chapter 4).
- Give paracetamol if the child has high fever (axillary temperature of 38.5°C or above).
- Advise the mother to return immediately with the child if the child develops any danger sign.
- Follow up in 2 days if fever persists.

Management of the child with non-falciparum malaria

The child with NON-FALCIPARUM MALARIA needs treatment with oral antimalarial therapy as per national guidelines.

- In areas with chloroquine-sensitive vivax malaria: chloroquine (10 mg base/kg once daily for 2 days, then 5 mg base/kg on day 3) combined with primaquine (0.25 mg base/kg taken with food once daily for 14 days)
- In areas with chloroquine-resistant vivax malaria: amodiaquine (10 mg/kg single daily dose for 3 days) combined with primaquine (0.25 mg base/kg taken with food once daily for 14 days)
- Advise the mother to return immediately with the child if the child develops any danger sign.
- Follow up in 2 days if fever persists.

Management of the child with mixed plasmodium infections

Mixed malaria infections with both *P. falciparum* and *P. vivax* occur commonly in many areas of the world, such as Latin America, Timor-Leste, Ethiopia, and other parts of north-east Africa and Asia. In these areas, when malaria is diagnosed on clinical grounds, both *P. falciparum* and *P. vivax* infection should be treated. During the acute phase of an emergency, detection of life-threatening *P. falciparum* infection is the main priority, and use of an ACT (except artesunate–SP) will effectively treat both *P. falciparum* and *P. vivax*.

Measles

Assessment of the child with measles

Children with fever should be assessed for signs suggesting measles:
Generalized rash AND one of the following:

- cough
- runny nose
- red eyes

Classify the child's measles

Severe complicated measles

Signs of measles and:

- Any general danger sign (lethargy or unconsciousness, convulsions, or inability to drink)
- Clouding of the cornea
- Deep or extensive mouth ulcers
- Stridor

Managing the child with severe complicated measles

- Refer to hospital
- Give the child three doses of Vitamin A
 - Give the first dose on Day 1
 - Give the second dose on Day 2
 - Give the third dose in one month, if possible

Measles with eye or mouth complications

Signs of measles and:

- Mouth ulcers
- Pus draining from eye

Managing the child with measles and eye or mouth complications

- Give the child two doses of Vitamin A
 - Give the first dose on Day 1
 - Give the second dose to the mother to give to her child on Day 2
- Treat eye infection with tetracycline ointment
- Treat mouth ulcer with gentian violet

Uncomplicated measles

Signs of measles but no signs of severe diseases or eye or mouth complications

Managing the child with uncomplicated measles

- Give the child two doses of Vitamin A
 - Give the first dose on Day 1
 - Give the second dose to the mother to give to her child on Day 2

Assess the child with measles

Children with MEASLES have fever AND a generalized rash AND one or more of either cough, runny nose or red eyes.

The child with measles (and the child who had measles within the past 3 months) should be assessed for complications of measles:

- Mouth ulcers
- Pus draining from the eye
- Clouding of the cornea

Classify the child with measles

The child with measles should be classified as one of the following based on the severity of the illness and eye or mouth complications:

- Severe complicated measles
- Measles with eye or mouth complications
- Uncomplicated measles

- Classify the child as SEVERE COMPLICATED MEASLES if the child has signs of measles AND:
 - General danger sign such as lethargy or unconsciousness, convulsions, or inability to eat or drink
 - Clouding of the cornea
 - Deep or extensive mouth ulcers

Other serious complications of measles include:

- Stridor
- Severe pneumonia
- Severe dehydration
- Severe malnutrition

- Classify the child as MEASLES WITH EYE OR MOUTH COMPLICATIONS if the above signs are not present but the child has signs of measles AND:
 - Mouth ulcers
 - Pus draining from the eye

- Children with eye or mouth complications of measles also can develop:
 - Pneumonia (Module 2, Chapter 4)
 - Diarrhoea (Module 2, Chapter 3)
 - Airway obstruction (Module 1, Chapter 2)
 - Ear infection (Module 2, Chapter 5)

Management of the child with measles

The child with SEVERE COMPLICATED MEASLES needs urgent care, antibiotics and vitamin A.

- If possible, refer the child with SEVERE COMPLICATED MEASLES to hospital for care.
- Give 3 doses of vitamin A. Give the first dose on the first day and the second dose on day 2. Give the third dose after two weeks if possible.
 - For infants under 6 months, give 50 000 IU of vitamin A each day
 - For children 6 to 11 months, give 100 000 IU of vitamin A each day
 - For children older than 11 months, give 200 000 of vitamin A each day
- Give the child antibiotics for pneumonia (see Module 2, Chapter 4)
- If the child has mouth ulcers, apply half-strength (0.25%) gentian violet twice a day for 5 days.
- Help the mother feed her child. If the child cannot swallow, feed the child by NG tube.
- If the child has corneal clouding, be very gentle in examining the child's eye. Treat the eye with tetracycline eye ointment three times a day for 7 days. Only pull down on the lower lid and do not apply pressure to the eye. Keep the eye patched gently with clean gauze.
- Feed the child to prevent malnutrition.

The child with MEASLES AND EYE OR MOUTH COMPLICATIONS needs vitamin A.

- Give the child Vitamin A.
 - The 1st dose should be given to the child by health worker.
 - Give the 2nd dose to the mother to give to her child the next day.
- Teach the mother to treat mouth ulcers with half-strength (0.25%) gentian violet twice a day
- Teach the mother to treat the eye infection carefully with tetracycline ointment. Only pull down on the lower eye lid and do not apply pressure to the globe of the eye. Keep the eye patched gently with clean gauze.
- Advise the mother to return immediately with the child if the child develops any danger sign (lethargy or unconsciousness, convulsions, or inability to drink).
- Follow up in 2 days.

The child with UNCOMPLICATED MEASLES needs vitamin A.

- Give the child Vitamin A.
 - The 1st dose should be given to the child by the health worker.
 - Give the 2nd dose to the mother to give to her child the next day.

Severe febrile disease: meningitis and sepsis

Assessment of the child with severe febrile disease

- Fever
 - General danger sign, such as lethargy or unconsciousness, convulsions or inability to drink
 - Stiff neck (a sign of meningitis)
- If possible, refer the child to a hospital for care.

Classify the child's severe febrile disease

Meningitis

- Fever
- Lethargy, unconsciousness, convulsions, or inability to drink
- Stiff neck

Sepsis

- Fever
- Lethargy, unconsciousness, convulsions, or inability to drink

Managing the child with meningitis

- Give the child antibiotics for meningitis:
 - Intramuscular (IM) chloramphenicol AND IM benzylpenicillin
 - OR IM chloramphenicol AND IM ampicillin
 - Every 6 hours (if not possible, use the 8- or 12-hour dosing)
 - Give antibiotics by injection for 3-5 days
 - If significant drug resistance known to these antibiotics, give ceftriaxone.
 - If the child is well by 3-5 days, change to oral antibiotics (chloramphenicol).
 - Treat with antibiotics for a total of 10 consecutive days
- Give fluids. There are no fluid restrictions for MENINGITIS. Give maintenance dose:

Weight	Total amount in 24 hours
Less than 10 kg	100 ml/kg/day
10 to 20 KG	50 ml/kg/day
More than 20 KG	25 ml/kg/day for the weight over and above 20 Kg

- If the child is vomiting everything or is not able to drink or breastfeed, give fluid by NG tube.
- If you do not know how to use an NG tube and child is able to swallow, use a dropper to give the child fluids very slowly, or drip the fluid from a cup or syringe without the needle.

Managing the child with sepsis

- Give the child antibiotics for sepsis:
 - Give intramuscular (IM) chloramphenicol AND IM benzylpenicillin
 - If response poor after 48 hours, give IM gentamicin PLUS Ampicillin (or ceftriaxone)
 - If the child is well by 3-5 days, change to oral antibiotics (chloramphenicol)
 - If significant drug resistance known to these antibiotics, give ceftriaxone
 - Treat with antibiotics for a total of 10 consecutive days.

- Give fluids:

Weight	Total amount in 24 hours
Less than 10 kg	100 ml/kg/day
10 to 20 kg	50 ml/kg/day
More than 20 kg	25 ml/kg/day for the weight over and above 20 Kg

- If the child is vomiting everything or is not able to drink or breastfeed, give fluid by NG tube.
- If you do not know how to use an NG tube and child is able to swallow, use a dropper to give the child fluids very slowly, or drip the fluid from a cup or syringe without the needle.

Severe malaria

The child with SEVERE FEBRILE DISEASE may also have malaria.

- In a high risk malaria area, also treat the child for severe malaria - see 5.1.

Management of the child with severe febrile disease

The child with SEVERE FEBRILE DISEASE needs urgent treatment.

For **meningitis** treat with:

- Intramuscular (IM) chloramphenicol (25mg/kg/dose) AND IM benzylpenicillin (100 000 units/kg/dose), every 6 hours (if not possible use the 8-hour or 12-hour dosing schedule).
- OR
- IM chloramphenicol (25mg/kg/dose) AND IM ampicillin (50 mg/kg/dose), every 6 hours.
- If significant drug resistance known to these antibiotics, give ceftriaxone (50mg/kg IM/IV over 30-60 minutes every 12 hours or 100mg/kg IM/IV over 30-60 minutes once daily).
- Give antibiotics by injection for a minimum of 3-5 days.
- If the child is well by 3-5 days, change to oral chloramphenicol (25mg/kg every 8 hours).
- Treat with antibiotics for a total of 10 days.
- Treat for SEVERE MALARIA in a high risk malaria area.
- Manage fluids carefully (see box in Flow Chart) - intravenous fluid may be necessary

For **sepsis** treat with:

- Intramuscular (IM) chloramphenicol (25mg/kg/dose every 8 hours) AND IM benzylpenicillin (50 000 units/kg/dose every 6 hours).
- If response poor after 48 hours, give IM gentamicin (7.5 mg/kg per day) AND ampicillin (50 mg/kg every 6 hours).
- If significant drug resistance known to these antibiotics, give ceftriaxone (80mg/kg IM/IV over 30-60 minutes once daily).
- If the child is well by 3-5 days, change to oral chloramphenicol (25mg/kg every 8 hours).
- Treat with antibiotics for a total of ten consecutive days.
- Treat for SEVERE MALARIA in a high risk malaria area.
- Manage fluids carefully (see box in Flow Chart) - intravenous fluid may be necessary.

Ear problem

A child with an ear problem usually presents with ear pain or discharge with or without fever. If acute (<14 days) treat with amoxicillin. If chronic, treat with dry wicking together with topical quinolone ear drops for 2 weeks.

The child has acute ear infection if illness is less than 14 days and can be treated with amoxicillin for 5 days. If the ear problem has been present for 14 days or more, it is a chronic ear infection which should be treated with ear wicking and local quinolones. If there is a tender swelling behind the ear it may be what is called "mastoiditis" and needs referral to hospital.

ASK: Does the child have an ear problem?

If yes, ask:

- Is there ear pain?
- Is there ear discharge? If yes, for how long?

Look and feel:

- Look for pus draining from the ear.
- Feel for tender swelling behind the ear.

Classify ear problem

Skin lesions: local bacterial infection or abscess

Assessment of the child with fever and skin lesions

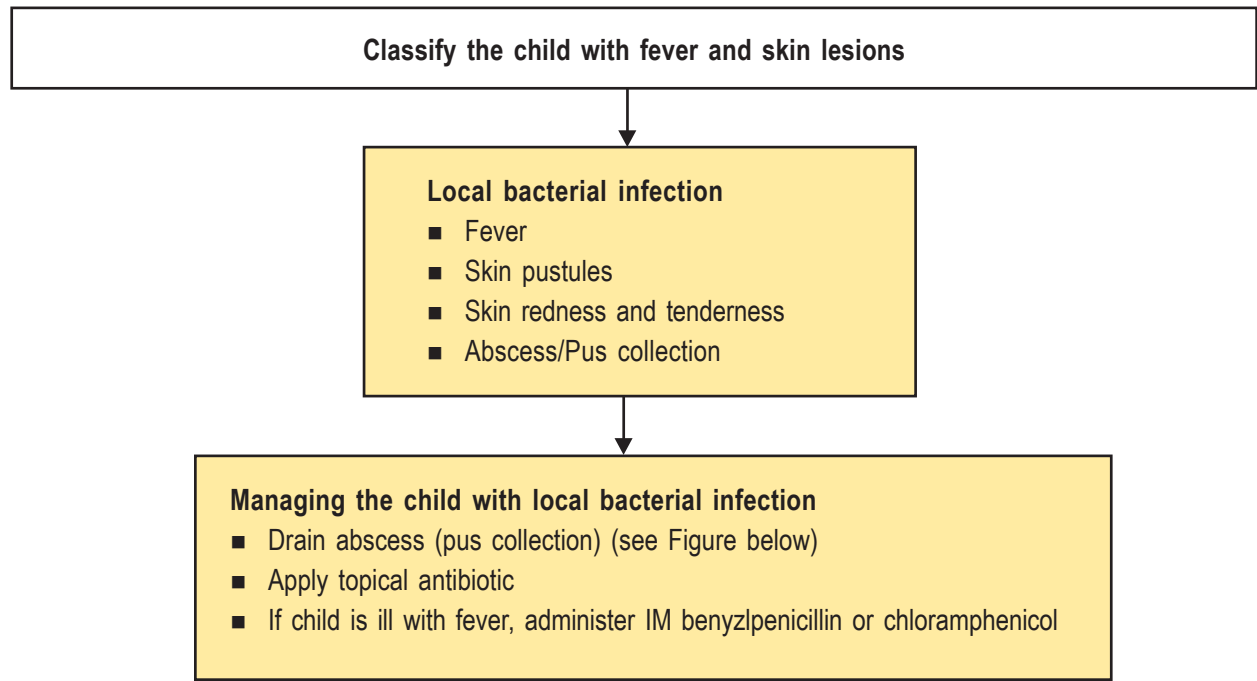
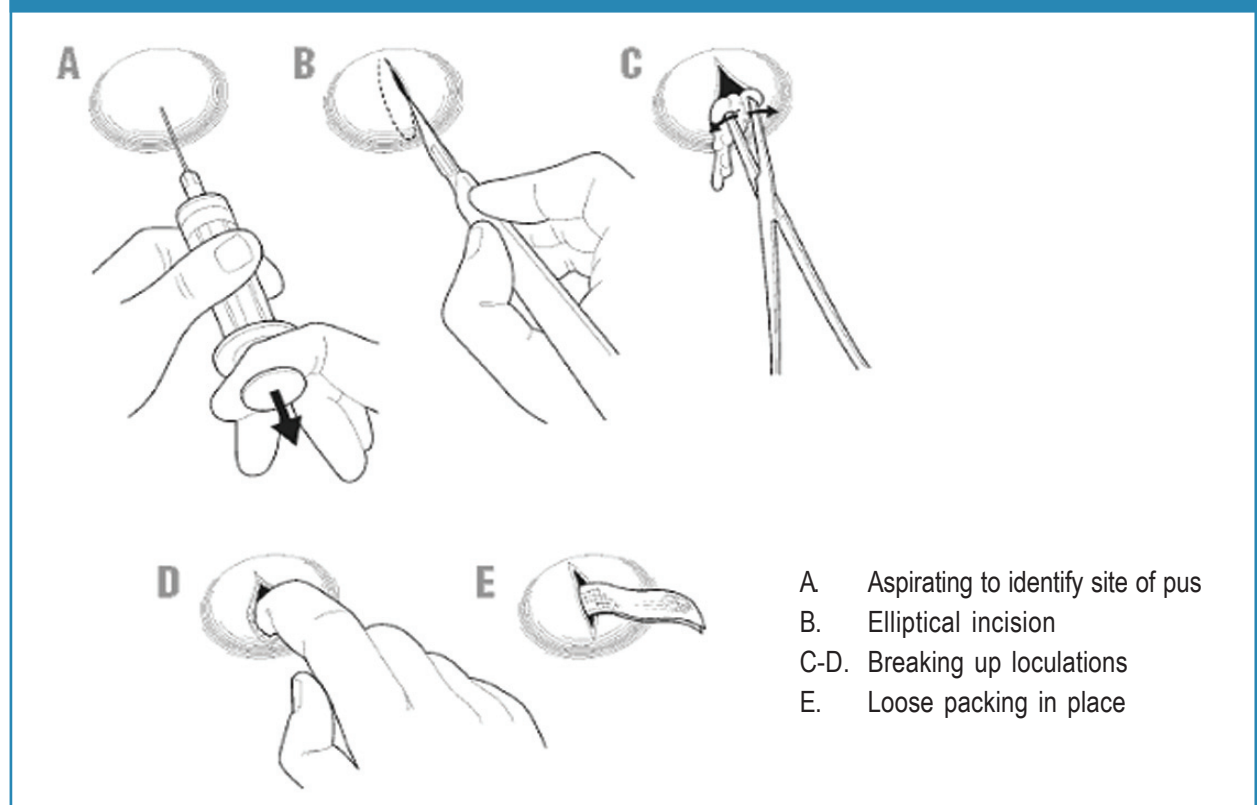


Figure 3: Incision and drainage of an abscess



Chapter 6

Malnutrition

Assessment the child with malnutrition

For all children

- Determine weight for age
- Look for oedema on both feet/legs
- Look for visible severe wasting

For children older than 6 months

- Measure the mid upper arm circumference (MUAC)
- Assess for appetite

Classify the level of the child's malnutrition

If age up to 6 months and

- visible severe wasting OR
- oedema of both feet

If age 6–59 months and

- MUAC less than 110 mm OR oedema of both feet OR visible severe wasting

AND

poor appetite¹ OR pneumonia OR persistent diarrhoea OR dysentery

The child has SEVERE COMPLICATED MALNUTRITION

REFER to hospital or feeding centre.

If age 6–59 months and

- MUAC less than 110 mm OR
- oedema of both feet or visible severe wasting AND
- satisfactory appetite¹

The child has SEVERE UNCOMPLICATED MALNUTRITION

- Counsel the mother on how to feed a child with RUTF², if available, or refer to feeding centre or hospital
- Give antibiotic
- Give mebendazole (if child aged 1 year or above), and first-line oral antibiotic
- Check for HIV infection
- Assess the child's feeding
- Advise mother when to return immediately
- Follow-up in 7 days

For all ages, if:

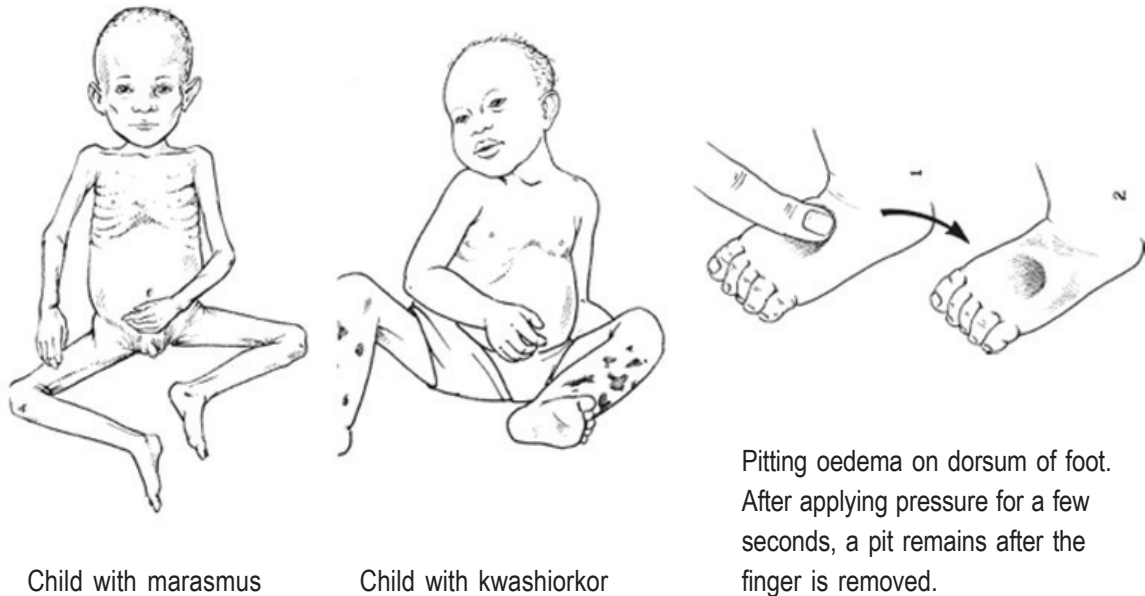
- No oedema
- No visible severe wasting
- MUAC > 110 mm
- very low weight for age

The child has MODERATE MALNUTRITION /VERY LOW WEIGHT)

- Assess the child's feeding and counsel the mother on feeding
- Check for HIV infection
- Advise mother when to return immediately
- Follow-up in 30 days

¹ Appetite is assessed by observing the child eating Ready-to-Use Therapeutic Food (RUTF²), where available, otherwise other foods.

Figure 4: Visible severe wasting and oedema



Assess the child with malnutrition

To assess severe wasting:

- Look for severe wasting of the muscles of the shoulders, arms, buttocks and legs (that is, there is no fat and it looks like skin and bones) (see figure 4).
- Look to see if the outline of the child's ribs is easily seen.
- Look at the child's hips. They may look small when you compare them with the chest and abdomen.
- Look at the child from the side to see if the fat of the buttocks is missing. When wasting is extreme, there are many folds of skin on the buttocks and thigh.
- The child's abdomen may be large or distended.
- The face of a child with visible severe wasting may still look normal.

To look for oedema:

- Use your thumb to press gently for a few seconds on the top side of each foot. The child has oedema if a dent remains in the child's foot when you lift your thumb (see Figure x).

To assess mid-upper arm circumference (MUAC):

- Use an adapted tape measure. Read measure (or colour) in the window.

To assess weight for age, use the graph in Annex 2.

Classify the child with malnutrition

There are three classifications for a child's malnutrition.

- A child with visible severe wasting or oedema of both feet or in the case of the child age 6 up to 59 months, MUAC<110 mm, AND poor appetite or pneumonia or persistent diarrhoea or dysentery, classify as having severe complicated malnutrition.
- A child with visible severe wasting or oedema of both feet or in the case of the child age 6 up to 59 months, MUAC<110 mm, but some appetite and no pneumonia, no persistent diarrhoea or no dysentery, classify as having severe uncomplicated malnutrition.
- A child with none of the above but weight for age is less than minus 2SD of the mean (see Annex 2), classify as moderate malnutrition or low weight for age.

Management of the child with severe complicated malnutrition

Children classified as having SEVERE COMPLICATED MALNUTRITION are at risk of death from pneumonia, diarrhoea, measles, and other severe diseases. They should be admitted to an inpatient facility (therapeutic feeding centre or stabilisation centre) where they should receive intensive care, according to current WHO guidelines.

If referral to a facility is not possible, apply the protocol recommended for uncomplicated severe malnutrition.

After medical complications are addressed, and if the child is able to eat Ready-to-Use Therapeutic Food (RUTF), apply the protocol for severe uncomplicated malnutrition.

Management of the child with severe uncomplicated malnutrition

Routine medicine protocol for children with severe malnutrition

Name of Product	When	Age/Weight	Prescription	Dose
VITAMIN A ¹	At admission (EXCEPT children with oedema	< 6 months 6 months - < 1 year >1 year DO NOT USE WITH OEDEMA	50 000 IU 100 000 IU 200 000 IU	Single dose on admission (for children with oedema - single dose on discharge).
AMOXYCILLIN	At admission	All beneficiaries	See protocol	3 times a day for 7 days
ANTI MALARIAL (follow national protocol)	At admission in malarial areas	All beneficiaries	See protocol	Single dose on admission (when using ACT treat only Paracheck positive cases)
MEBENDAZOLE ²	Second visit	<1 year 12-23 months > 2 years	DO NOT GIVE 250 mg 500 mg	None Single dose on second visit
MEASLES VACCINATION	On week 4	From 6 months	Standard	Once on week 4

¹ **VITAMIN A:** Do not give, if the child had already received Vitamin A in the last one month: Do not give to children with oedema until discharge from OTP, unless there are signs of Vitamin A deficiency.

² **MEBENDAZOLE:** Or other antihelminth according to national guidelines e.g. **ALBENDAZOLE:** 12-23 months 200 mg. > 2 years 400 mg. Both can be given again after 3 months if signs of re-infection appear.

IRON and FOLIC ACID: not to be given routinely. Where anaemia is identified according to IMCI Guidelines treatment should begin after 14 days in the programme and not before and given according to national/WHO guidelines (INACG, 1998). For severe anaemia refer to inpatient care.

Feeding protocol

- Give every week Ready-to-Use Therapeutic Food (RUTF) 200 kcal/kg/day during 2 months.
- See the child every week and give a week's supply of RUTF to take home.
- Monitor weight gain.

Moderate malnutrition/low weight for age

- Give 1000 to 1200 kcal /day, with 10–15% energy from protein. Examples of rations used for supplementary feeding:

Commodity	Ration 1(g)	Ration 2(g)	Ration 3(g)
Fortified blended food	200	250	140
Sugar	15	20	30
Oil	20	25	50
Dried skimmed milk	0	0	50
Energy (kcal)	1000	1250	1250
Protein (% energy)	14	14.5	14.5

Commodities in ration 3 should be given as a premix.

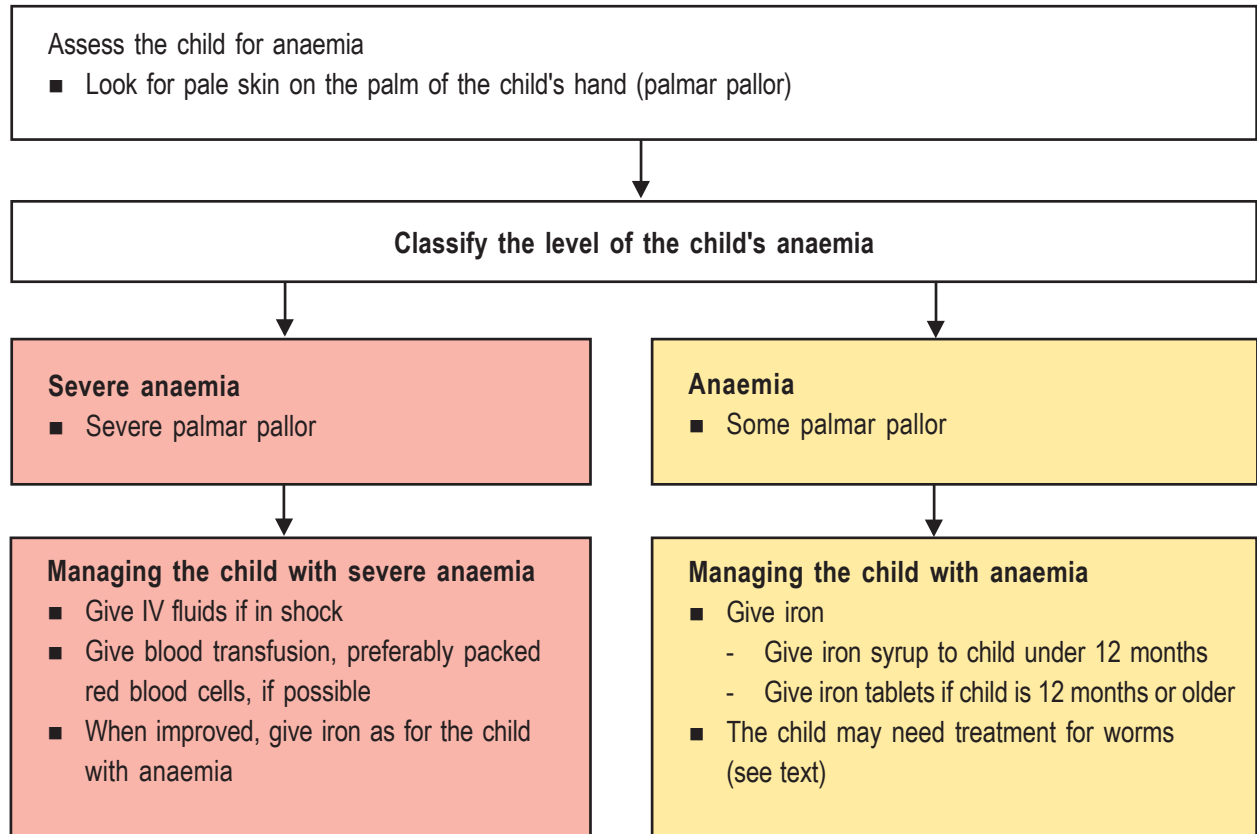
Additional information on management of malnutrition in children in emergencies

- Reference: WHO (2000). Management of nutrition in major emergencies. Available at: <http://whqlibdoc.who.int/publications/2000/9241545208.pdf>
- Valid International. Community based therapeutic care. A field manual, 2006.
- Management of the child with a serious infection or severe malnutrition, WHO 2000).
- Management of severe malnutrition: a manual for physicians and other senior health workers, WHO 1999.

Chapter 7

Pallor/anaemia

Assessment the child with anaemia



Assess the child with anaemia

- LOOK for palmar pallor (unusual paleness of the skin)
 - Look at the skin of the child's palm
 - Compare the colour of the child's palm with your own palm and with the palms of other children.
- If the skin of the child's palm is pale, the child has some palmar pallor
- If the skin of the palm is very pale or so pale that it looks white, the child has severe palmar pallor.

If possible, measure the haemoglobin or packed cell volume (PCV).

Classify the child with anaemia

Classify the child with severe palmar pallor as SEVERE ANAEMIA.

- A child with severe anaemia is in danger of congestive heart failure.

Classify the child with some palmar pallor as ANAEMIA.

Management of the child with severe anaemia

This child needs:

- IV fluids if in shock (see Module 1, Chapter 2).
- Blood transfusion if possible (see below).
- When improved, the child will need iron as for the child with anemia.

Blood transfusion for severe anaemia

It is essential to ensure a safe supply of blood for transfusion. Blood should be cross-matched and screened for HIV, malaria and hepatitis B, and if possible, hepatitis C and syphilis. If a safe supply cannot be assured, transfusion should be restricted to patients with severe anaemia and signs of shock (i.e. cold hands and capillary refill > 3 seconds or weak fast pulse) or severe respiratory distress (fast breathing or chest indrawing). If suitable donors without malaria infection cannot be found, blood should be administered with antimalarial treatment.

Children with haemoglobin <5 g/dl (or packed cell volume <15%) and respiratory distress need blood as an *emergency*.

- Give 20 ml/kg, as packed red cells or whole blood.
- Infuse the first 10 ml/kg over 30 minutes and the next 10 ml/kg over 2 hours.
- Reassess the patient at the end of the transfusion. If the child still has respiratory distress and haemoglobin <5 g/dl, repeat the transfusion.

Children with haemoglobin <5 g/dl (or packed cell volume <15%) but without respiratory distress should be transfused but, because their condition is less critical, can be given 20 ml/kg over 3–4 hours.

- Diuretics (furosemide) are unnecessary.

Severely malnourished children (severe wasting plus oedema).

- Give blood much more cautiously to these children
- Infuse 10 ml/kg blood over 3 hours.
- Give furosemide, 1 mg/kg IV, halfway through the transfusion.

Management of the child with anaemia¹

This child needs the following interventions.

- Give iron syrup to the child under 12 months of age.
- Give iron tablets if the child is 12 months or older.
- Give the mother enough iron for 14 days. Tell her to give her child one dose daily for the next 14 days.
- Do not give iron to a child receiving the antimalarial sulfadoxine-pyrimethamine
- The child may need treatment for malaria if the malaria risk is high.
- Only if there are worms in the area or if the hygienic situation is bad give the child mebendazole or albendazole. Only give mebendazole if the child with anaemia is 1 year of age or older and has not had a dose of mebendazole in the last 6 months.
- As vitamin C helps iron absorption, advise the caretaker to give citrus fruits to the child.
- Advise that iron tablets may cause constipation.
- Advise the mother to return immediately with the child if the child develops any danger sign (lethargy or unconsciousness, convulsions, or inability to drink).
- Follow up in 14 days.

¹ Anaemia in Mediterranean countries may be due to thalassemia or sickle cell and special attention should be given.

Chapter 8

Newborn and young infant up to 2 months

Newborn assessment and resuscitation

At delivery:

- Dry and stimulate the newborn
 - Dry the baby with a warm, clean cloth
 - Stimulate the baby by rubbing up and down on the back while drying
 - Do not rub off the vernix (the creamy white coating on the skin)
 - Do not slap the baby

- LOOK: Count the baby's breaths in one minute and look at the breathing while counting the breaths.
 - Is the infant breathing less than 20 breaths per minute?
 - Is infant not breathing, gasping, or breathing noisily?
 - Is the color blue (infant's tongue, lips, or trunk look blue)
 - Is the infant floppy?

If YES, for any of the above, begin resuscitation!

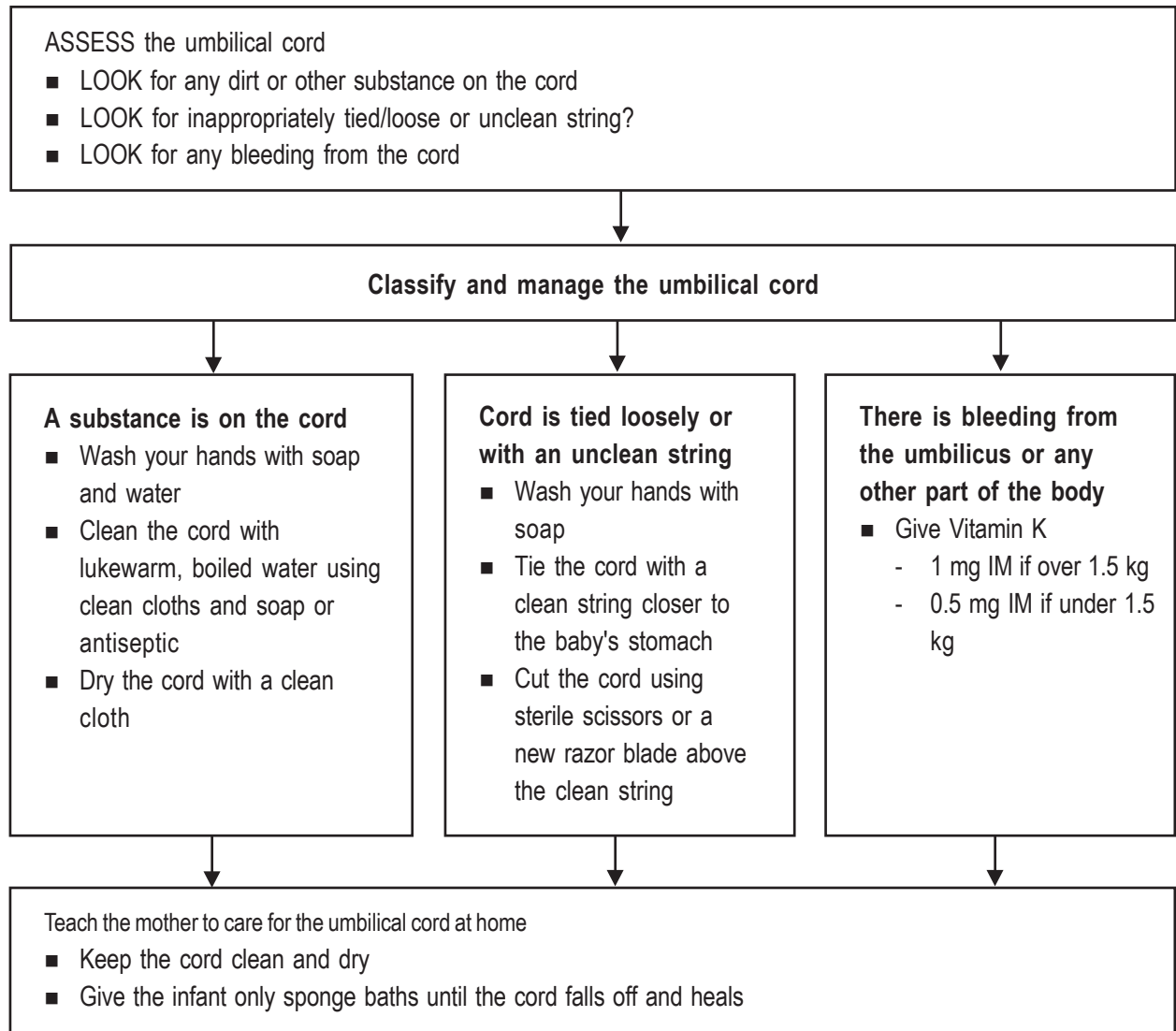


Resuscitation of newborn




- Position the baby to open the airway.
- Suction the mouth and nose, but do NOT suction deep in the throat.
- Give rescue breaths using mask if available. If no mask is available, use mouth to mouth. Use gauze, if available, to cover the sides of the baby's nose and mouth and then cover the baby's nose and mouth with your mouth and give two rescue breaths.
- Look for the infant's chest to rise.
- Give 40 breaths per minute.
- Recheck the infant's breathing rate after 1 minute.
- Continue giving rescue breaths until the baby starts breathing normally, checking after every minute. Stop after 20 minutes if the baby is not breathing at all.

Immediate care of the newborn



Early care of the newborn

Early care of the newborn



Keep baby warm

- Teach the mother to keep the baby warm
 - put the baby in skin-to-skin contact with the mother's chest
 - cover the baby with a warm cloth or blanket
 - cover the baby's head
- Do not bathe the baby until 24 hours after birth
- Encourage the mother to breastfeed
- Initiate breastfeeding within the first hour of birth

Eye care

- Wash your hands
- Use silver nitrate 1% or polyvidone-iodine solution 2.5% or tetracycline 1% eye ointment
- Place one drop of medication or one ribbon of ointment along the lower eyelid
- Repeat for the second eye
- Do not rinse out the medication or ointment

Immunizations

- Give immunizations according to national guidelines. These may include:
 - BCG
 - Polio
 - Hepatitis B

Vitamin K

- Give vitamin K prophylaxis to every newborn

Danger signs

- Teach the mother about danger signs in newborns
 - Decreased breathing or noisy breathing
 - Poor feeding
 - Lethargy

Assessment of the infant up to 2 months of age

- ASK: Is the infant having difficulty feeding?
- ASK: Has the infant had convulsions?
- LOOK: Count the breaths in one minute.
 - Repeat if more than 60 breaths per minute.
- LOOK for severe chest indrawing
- LOOK and LISTEN for grunting
- LOOK at the young infant's movements
 - Does the infant move only when stimulated?
 - Does the infant not move even when stimulated?
- MEASURE axillary temperature if possible
- LOOK at the umbilicus. Is it red or draining pus?
- LOOK for skin pustules

Classify the level of the infant's bacterial infection

Severe disease

Any one of the following:

- Not feeding well
- Convulsions
- Fast breathing
- Severe chest indrawing
- Grunting
- Movement only when stimulated or no movement even when stimulated
- Fever (37.5°C or above)
- Low body temperature (less than 35.5°C)

Manage infant with severe disease

- Give first dose of the appropriate antibiotic (see text)
- Keep the infant warm
- Manage fluids carefully
- Treat the child to prevent low blood sugar
- Refer URGENTLY to hospital

Local bacterial infection

- Umbilicus red or draining pus
- Skin pustules

Manage infant with local bacterial infection

- Give an appropriate oral antibiotic (see text)
- Teach the mother to administer the antibiotics at home
- Follow up in two days to be sure the infection is improving

Assess the young infant with illness

In the young infant up to 2 months, assess for **severe disease** or **local bacterial infection** following the flow chart.

If the mother says that the young infant has diarrhoea, assess for and classify the diarrhoea.

- The normally frequent or loose stools of a breastfed baby are not diarrhoea.
- The mother of a breastfed baby should be able to recognize diarrhoea by the fact that the consistency or frequency of the stools will be different from normal.
- The assessment is similar to the assessment of diarrhoea for an older infant or young child (Module 2, Chapter 3), but fewer signs are checked. Thirst is not assessed. This is because it is not possible to distinguish thirst from hunger in a young infant.
- Diarrhoea in a young infant is classified in the same way as in an older infant or young child (see Module 2, Chapter 3).

Management of the young infant with possible severe bacterial infection

The young infant with possible severe bacterial infection needs urgent care and may have pneumonia, sepsis or meningitis. If possible, refer the infant to a hospital for urgent care after giving the first dose of an appropriate antibiotic.

- Treat the young infant with antibiotics¹
 - Give intramuscular (IM) benzylpenicillin AND intramuscular (IM) gentamicin and treat with antibiotics for at least a total of 10 days (up to 3 weeks).
 - If not improving in 2-3 days the antibiotic treatment may need to be changed, or the baby referred.
 - If meningitis is suspected (bulging fontanelle), give IM gentamicin AND IM ampicillin if available, OR treat with IM/IV ceftriaxone. Treat meningitis for 21 days.
- Continue the IM/IV treatment until the infant has been well for at least 3 days.
- Then substitute the IM/IV treatment with an appropriate oral antibiotic such as amoxicillin.

¹ Antibiotic doses in young infants:

- Benzylpenicillin: 50 000 units/kg/dose 12 hourly (1st week of life) or 6 hourly (weeks 2-4 and older). (Vial of 600 mg [1 000 000 units] dilute with 1.6 ml sterile water to give 500 000 units/ml).
- Gentamicin: 5mg/kg/dose once daily (1st week of life) or 7.5 mg/kg/dose once daily (aged weeks 2-4 and older), (vial of 80mg/2ml, dilute to 8ml with sterile water to give 10mg/ml).
- Ampicillin: 50 mg/kg/dose IM/IV every 12 hours (1st week of life), every 8 hours (weeks 2-4 of life), (vial of 250 mg mix with 1.3 ml sterile water to give 250 mg/1.5 ml).
- Ceftriaxone: 50 mg/kg/dose IV every 12 hours or 100mg/kg IV/IM once daily (vial of 1g mix with 9.6 ml sterile water to give 1g/10 ml).
- Chloramphenicol: 25 mg/kg/dose IV every 12 hours or 25 mg/kg/dose IM every 6 hours (vial of 1g mixed with 9.2 ml sterile saline to give 1g/10 ml).

- Continue to give IM gentamicin until a minimum treatment of 5 days has been given.
- If there is no response to the treatment after 48 hours, or if the infant's condition deteriorates, then give IV/IM chloramphenicol (but not in premature/low weight neonates).
- Treat convulsions/fits with phenobarbital (loading dose of 15 mg/kg). If convulsions persists, give further doses of 10 mg/kg phenobarbital up to a maximum of 40 mg/kg (see page 49). Watch out for apnoea (infant stops breathing). If needed, continue with phenobarbital at a maintenance dose of 5 mg/kg/day.
- Keep the young infant warm.
- Manage fluids carefully.
- Prevent low blood sugar
 - The mother should breastfeed the infant frequently.
 - If the infant has difficulty breathing or is too sick to suckle, help the mother express breast milk. Feed the expressed breast milk to the infant by dropper (if able to swallow) or by NG tube 6 times per day. Give 20 ml of breast milk per kilogram of body weight at each feed. Give a total of 120 ml/kg/day.
 - If the mother is not able to express breast milk, prepare a breast milk substitute or give diluted cow's milk with added sugar.

Management of the young infant with local bacterial infection

Young infants with local bacterial infection often have an infected umbilicus or a skin infection.

- Treatment includes giving an appropriate oral antibiotic, such as oral amoxicillin, for 5 days.
- Teach the mother to administer the antibiotics.
- If possible, the child should return for follow-up in 2 days to be sure the infection is improving.

Chapter 9

HIV/AIDS

Check child for HIV infection, if you are in high HIV prevalence settings

ASK: Did the mother or baby have an HIV test done for them?

OR

Does the child have one or more of the following conditions?

- Pneumonia¹
- Persistent diarrhoea¹
- Ear discharge (acute or chronic)
- Very low weight for age

LOOK AND FEEL:

- Oral thrush
- Parotid enlargement
- Generalized persistent lymphadenopathy

Classify for symptomatic HIV

Confirmed HIV infection

- Positive HIV antibody test in child 18 months and above
- OR
- Positive HIV virological test
- AND
- Less than two conditions

Suspected symptomatic HIV infection

- Two or more conditions
- AND
- No test results in child or positive antibody test in child <18 months

Possible HIV / HIV exposed

- Less than two conditions
- AND
- One or both of the following conditions:
- Mother HIV positive and no test result on child
- OR
- Child less than 18 months with positive antibody test

¹ Note that the severe forms such as severe pneumonia, severe persistent diarrhoea and severe malnutrition can be used to enter the box. In that case, assess child quickly and refer.

Assess and classify the child for HIV/AIDS

You will need to check for suspected symptomatic HIV infection or exposure to HIV if the mother is known to be HIV positive or if the child has one of the following based on your previous classification:

- Pneumonia
- Persistent Diarrhoea
- Ear discharge
- Very low weight for age.

You will need to note or ASK:

- Does the child have COUGH OR DIFFICULT BREATHING?
- Does the child have PERSISTENT DIARRHOEA?
- Does the child have EAR DISCHARGE?
- Does the child have VERY LOW WEIGHT?

Note: If the child has: SEVERE PNEUMONIA OR SEVERE FEBRILE DISEASE or SEVERE PERSISTENT DIARRHOEA or SEVERE MALNUTRITION then the child should also be checked for SUSPECTED SYMPTOMATIC HIV INFECTION.

Look and feel:

- Are there any enlarged lymph glands in two or more of the following sites: neck, armpit or groin (generalised persistent lymphadenopathy)?
- Is there oral thrush?
- Is there parotid enlargement?

Note that the results from the mother and child's HIV tests are used in the classification process.

Management of the child with suspected HIV/AIDS

Children, classified as SUSPECTED SYMPTOMATIC HIV INFECTION, CONFIRMED HIV INFECTION or POSSIBLE HIV INFECTION / HIV EXPOSED will need to be referred to confirm the HIV infection and assess whether they need antiretroviral therapy (ART). Before starting antiretroviral therapy, a child must first be stabilised. This means any acute common illnesses and opportunistic infections must be treated and the general condition of the child improved.

Chapter 10

Injuries

Assessment of the injured child

- Assess Airway, Breathing and Circulation
- Ask the mother to describe how the child was injured
- Ask where on the body the child was injured
- Examine the injured area as well as the entire child
- Look: Is the child lethargic or unconscious? If yes, this is a danger sign (Coma) that requires emergency management
- Does the child respond to voice? Does the child turn his head or open his eyes in response to voice?
- Pinch a finger or toe. Rub the child's chest. Does the child respond by making a movement or opening his eyes?
- If the child does not respond to pain or voice, this is a danger sign (Coma) and requires emergency management

Examine the child using the chart on the next page

Classify the level of the child's injury

Severe injury

Includes any injuries to the:

- Head
- Neck
- Chest
- Abdomen
- Back
- Pelvis

Massive blood loss, externally or internally, can lead to shock and requires urgent attention.

Moderate injury

- Broken arm
- Broken leg
- Moderate bleeding

Managing the injured child

- Stop bleeding by applying firm pressure with a clean cloth
- Clean and dress all wounds
- If there is a dirty/contaminated wound, give a tetanus toxoid (Td) shot to the child
- Stabilize and set broken bones
- Refer severe injuries to hospital, if possible

Examination of the injured child

Head:

- Look for bruising around the eyes or behind the ears, which can be a sign of a skull fracture
- Look to see if there is leaking of clear or yellowish fluid called cerebrospinal fluid from the ears or nose, which can be a sign of skull fracture
- Shine a light in each eye and check that the pupils become smaller when the light is on the eye. When the light is off the eye, the pupil should get bigger. Both pupils should be the same size as they react to the light. If not, this can be a sign of brain damage.

Neck:

- Look at the spine for any sign of injury
- Feel for any step off or deformity in the neck
- Assess tenderness of the spine
- If there is any sign of injury, deformity, or tenderness do not move the child. This may suggest a broken spine which causes damage to the nerves and affects the child's ability to move or feel below the level of the neck. This may also affect the child's ability to breathe.

Chest:

- Watch the child breathe. Do both sides of the chest rise when the child breathes in? Do both sides of the chest lower when the child breathes out? If not, this could suggest a collapsed or blocked lung.
- Are there any bruises or wounds on the chest? Is the chest deformed? If yes, this suggests a broken rib and maybe injury to the lung.

Abdomen:

- Are there bruises or wounds on the abdomen? If yes, this suggests there may be damage to the organs inside which may cause internal bleeding.
- Feel the abdomen. Place four fingers of one hand on the abdomen and press down slowly and gently. Does this cause the child pain? If not, press a little firmer. Does this hurt the child? If not, move your hand around the abdomen to feel both sides, the top, and the bottom. Any pain suggests injury to the organs inside.

Back:

- If there is any neck injury, do not move the child, do not roll the child over
- If there is not a neck injury, roll the child onto his side and look at his back
- Roll the child carefully, keeping the shoulders and pelvis in line so the back stays straight and does not twist.
- Is there any step off or deformity over the spine? If yes, this suggests injury to the spine and perhaps the nerves in the spinal column. These nerves are needed for the child to move and feel in the arms and legs.

Pelvis:

- Feel the bones of the pelvis. Does this cause the child pain or discomfort? If yes, this may suggest a broken pelvic bone.

Genitals:

- Look for any bruising or wounds around the child's genitals
- Is there blood around the urethra, where the urine comes out? If yes, this suggests injury to the urethra. Blood in urine suggests injury to the kidneys

Arms and Legs:

- Look for wounds on the arms and legs.
- Is there any deformity of the arms or legs? If yes, this suggests a broken bone.
- Can the child move his arms or legs on his own? If not, carefully feel each arm and leg to see if this causes the child pain.

Management of the injured child

Management of the injured child can proceed after addressing emergency signs.

- Stop bleeding by applying firm pressure with a clean cloth.
- Severe injuries usually require referral to a hospital. Severe injuries include:
 - Brain damage
 - Injury to the spine
 - Injury to internal organs in the chest or abdomen
 - Broken pelvic bone
 - Broken arm or leg

For non-severe injuries/wounds:

- Provide wound care
 - The goal of caring for wounds is to stop bleeding, prevent infection, assess damage to underlying body parts and promote wound healing.
 - Prevent infection by cleaning and dressing wounds
 - Cleaning the wound is the most important intervention to prevent wound infection. Most wounds are contaminated. They may contain blood clots, dirt, dead tissue or foreign material.
 - Wounds can be cleaned with clean water and soap or diluted chlorohexidine solution (20 ml of 5% chlorohexidine made up to 1 liter with water). Water and antiseptic should be poured into the wound.
 - Gentian violet (1 teaspoon of 0.5% gentian violet in 1 liter of clean water) should be applied once a day to wounds.
 - Tetanus prophylaxis
 - If not vaccinated, give anti-tetanus serum if available, and start a course of tetanus toxoid vaccine.
 - If the child has been vaccinated, but the vaccination status is not current, give a booster dose of tetanus toxoid.
 - Wound closure
 - Open wounds must be considered as contaminated and should not be closed immediately. Cleaning out of dead tissue is essential which, depending on the size of the wound, may necessitate a surgical procedure undertaken in appropriate (e.g. sterile) conditions.
 - If the wound is less than a day old and has been cleaned, the wound can be closed (delayed primary closure).
 - The wound should not be closed if it is more than 24 hours old, there was a lot of dirt and foreign material in the wound, or if the wound was caused by an animal bite.
 - Wounds not treated with primary closure should be packed lightly with damp gauze. If the wound is clean 48 hours later, the wound can then be closed.
 - If the wound is infected, pack the wound lightly and let it heal on its own.

For broken bones:

- Broken bones need to be set in plaster. If plaster is not available, the broken arm or leg can be stabilized with any flat, hard straight material such as a tree branch.
- Advise the mother when to return for follow-up, depending upon the type and severity of the injury.

Chapter 11

Burns

Assessment of the child with burns

- ASK how was the child burned?
- ASK how long was the child in contact with the hot substance?
- ASK was the child in an enclosed space, like a house, with smoke?
- LOOK where the burns are. Remove any clothing completely from burnt areas of body.
- ASSESS the child's breathing and voice or cry for airway injury. Listen for hoarseness, stridor or wheezing.
- ASSESS for lethargy/unconsciousness
- APPLY cool clean water on the burned area immediately.

Classify the level of the child's burn

Severe burn

- The child has difficulty breathing
- The child is unconscious or lethargic
- The burn affects more than 10% of the body surface area in children less than 12 months old
- The burn affects more than 15% of the body surface in children older than one year old
- The child has a third degree burn

Managing the child with severe burns

- Place burn immediately in cold water or apply cold, wet cloth
- Start IV line if possible
- Fluid replacement
- Pain medication
- Tetanus toxoid
- Clean and dress burn
- Look for signs of infection
- Treat infected wounds with topical antimicrobial or IM benzylpenicillin
- Refer to hospital if possible

Moderate burn

- The burn affects less than 10% of the body surface area in children less than 12 months old
- The burn affects less than 15% of the body surface in children older than one year old
- The child has a second degree burn
- The child has a first degree burn

Managing the child with moderate burns

- Place burn immediately in cold water or apply cold, wet cloth
- Pain medication
- Tetanus toxoid
- Clean and dress burn
- Look for signs of infection
- Treat infected wounds with topical antimicrobial or IM benzylpenicillin

Assess the child with burns

First assess the child in the order of ABCD, as described in the section on Triage and emergency assessment (Module 1, Chapter 1).

Classify the child with burns

Classify the burn based on:

- The appearance (degree) of burn
- How much of the body was burned (surface area)

Degree of burn

First degree	Skin red and painful to touch
Second degree, superficial	Skin red with blisters, painful to touch
Second degree, deep	Skin white, dry and soft
Third degree	Skin black, swollen and no sensation to touch

Surface area affected by burn

Entire head	19%
One arm	9%
Front or back of trunk	18%
One leg	14%

Classify the child as having SEVERE BURNS if:

- the burned child has difficulty breathing
- the burned child is unconscious or lethargic
- the burn affects 10% or more of the body surface area in an infant less than 12 months of age.
- the burn affects 15% or more of the body surface area in a child older than one year of age
- the child has a third degree burn

Classify the child as having MODERATE BURNS if:

- the burn affects less than 10% of the body surface area in an infant less than 12 months of age.
- the burn affects less than 15% of the body surface area in a child older than one year of age
- the child has a second degree burn
- the child has a first degree burn

Management of the child with burns

If the child was burned very recently, immerse the burned skin in clean cold water or apply a clean cold wet cloth to the burned area. If no clean cold water is available, use any intravenous (IV) fluid.

The child with SEVERE BURNS should be referred to hospital if possible. If referral is not possible:

- Start an intravenous (IV) line.
- Give the child fluid replacement for the first 24 hours. The volume of fluid replacement in the first 24 hours is equal to: the child's body weight (kg) x % of surface burned x 2 = quantity of fluid required in ml.
 - 75% of the fluid given as Ringer's lactate if available
 - Half of the total fluid volume for the first day should be given in the first 8 hours.
- Give pain medication: paracetamol and morphine.
- Give tetanus toxoid prophylaxis.
- Dress the burn as follows:
 - Use aseptic technique to dress the wound using sterile gloves and instruments.
 - Gently clean the burn with normal saline or Ringer's lactate or chlorhexidine-cetrimide solution.
 - Use a scalpel to remove dead (black) tissue.
 - Apply sterile Vaseline gauze on burned areas and then two additional layers of gauze pads.
 - Apply a loose bandage. Do not wrap limbs. Wrap each finger separately.
 - Immobilize limbs in the position of function.
- Assess the child every day, and more frequently if receiving IV fluids.
- If there are no signs of infection, change the dressing every 5-8 days.
- Healing tissue should be pink and clear fluid.
 - Look for any signs of infection, including pus, foul-smelling, increasing pain, or fever.
 - If the burn appears infected and the child is not very sick, topical antimicrobial agents such as silver sulfadiazine can be applied to the burn.
 - If the child appears ill from infection, give intramuscular (IM) procaine benzylpenicillin 100,000 IU/kg/day for 7 days. The duration of treatment should be decided based on the appearance of the burn and the child. Prolonged antibiotics can select for antibiotic-resistant bacteria, leading to an infection that is difficult to treat.

Management of the child with MODERATE BURNS includes:

- Medication for pain, such as paracetamol or morphine.
- Tetanus toxoid prophylaxis.

- If there are no referral services available, dress the burn as follows:
 - Use aseptic technique to dress the wound using sterile gloves and instruments.
 - Gently clean the burn with normal saline or Ringer's lactate or chlorhexidine-cetrimide solution.
 - Use a scalpel to remove any dead tissue.
 - Apply sterile Vaseline gauze on burned areas and, on top of that, two layers of gauze pads.
 - Apply a loose bandage. Do not wrap limbs. Wrap each finger separately.
 - Immobilize limbs in the position of function.

- Assess the child every other day.
- If there are no signs of infection, change the dressing every 5-8 days.
- Healing tissue should be pink and oozing clear fluid.
- Look for signs of infection, including pus, foul-smelling tissue, increasing pain or redness in skin around affected area, and fever.
- Potentially infected burns should be managed as described under SEVERE BURNS.
- Advise the mother when to return for follow-up, depending upon the location and severity of the burn.

Chapter 12

Poisoning

Poisoning can take place when a poisoning agent enters the body through one of the following routes: ingestion, inhalation, absorption through the skin/eyes, or through bites. Poisoning should be suspected in any unexplained illness in a previously healthy child. The child should be assessed for emergency and priority **signs** listed in this manual and managed accordingly. History of exposure to a poisoning agent should be enquired about from the mother/care taker. The container of the poisoning agent may give a clue to its nature. When the poisoning agent is identified management should be planned accordingly. Following are the common poisons and main lines of management.

General measures

A. Ingested poisons:

Gastric decontamination/lavage by inducing vomiting:

NO: When the child is unconscious and with the ingestion of corrosives or petroleum products.

YES: If the patient is conscious and within one hour of ingestion.

How?

- If activated charcoal is available, give by mouth or NG tube, and do not induce vomiting.
 - 1 year or over, give 25-50 gm
 - Less than 1 year, give 1gm/kg

- If charcoal is not available, induce vomiting by rubbing the back of the throat with a spatula or by giving emetics.

Never use salt as an emetic. Give water or milk.
- Perform gastric lavage only when experienced staff is available.
- Give ipecacuanha to induce vomiting.
- Keep under observation (4–24 hours) and give general supportive care.

Pediatric ipecacuanha
Dosage:
6–24 months: 10ml
> 24 months: 15 ml

B. Inhaled poisons:

- Remove from source.
- Administer supplemental oxygen if needed.
- Observe and refer if needed.

C. Skin Contamination:

- Remove all clothing, and store safely in a plastic bag.
- Wash body/area thoroughly with water, use soap for oily substances.
- Protect staff from secondary contamination by protective clothing and gloves.

D. Eye Contamination:

- Protect other eye while rinsing.
- Rinse eye for 10–15 minutes with clean running water or saline.
- Refer for further evaluation by ophthalmologist.

E. Specific poisons:

- Organo-phosphorous and carbamate compounds:

These can be ingested, inhaled or absorbed through the skin. May cause vomiting, diarrhea, blurred vision, weakness, salivation, sweating, lacrimation, or serious circulatory, respiratory and neurological symptoms and signs.

Do not induce vomiting.

 - Wash skin and eyes (as above).
 - Give activated charcoal if within one hour (if not available consider careful aspiration of the stomach with NG tube).
 - If excess symptoms (blurred vision, salivation etc) give atropine IM (0.015-0.05 mg/kg).
 - Monitor respiratory secretions, respiratory rate and heart rate.
 - Repeat atropine every 15 minutes until chest is clear and respiratory rate and heart rate are normal.
- Paracetamol
 - If within one hour, give active charcoal or induce vomiting.
 - Refer for antidote and further management if possible.
- Aspirin and other Salicylates
 - Give activated charcoal if available, if not perform gastric lavage and induce vomiting,
 - Refer for further management.
- Iron

If asymptomatic during the first 6 hours, no need for antidote.

If symptomatic:

 - Perform gastric lavage.
 - If serious, refer.
- Carbon monoxide poisoning
 - Give 100% oxygen.
 - Monitor for hypoxaemia.

F. Envenoming:

■ Snake

Avoid cutting wound and applying tourniquet

- Splint and elevate limb, apply firm bandage, clean wound, give analgesic, give antitetanus prophylaxis.
- Refer for antivenom, if possible.

■ Scorpion

- Give analgesics.
- Refer, if possible.

Module 3

Prevention of child morbidity and mortality

Chapter 13: Immunization and other public health measures

Chapter 14: Prevention of HIV infection

Chapter 15: Mental health and psychosocial support

Chapter 13

Immunization and other public health measures

Introduction

The following chapters are directed at the authority in charge of administering and managing public health measures for the population affected by the emergency situation and not for the health worker at the health center / clinic / post.

Public health measures

Prevention of child morbidity and mortality is critical to the care of children in emergencies. Preventive measures can sometimes be implemented during each encounter with a sick child, but often require community-based interventions such as:

- Provision of clean water and clean containers
- Proper sanitation including ensuring proper disposal of human waste
- Public education on hygiene behaviour and respiratory etiquette
- Provision of adequate nutrition
- Promotion of breast feeding
- Provision of means for safe food preparation and storage
- Vitamin A supplementation
- Vaccination, particularly against measles, diphtheria-tetanus-pertussis (DTP)
- Use of insecticide-treated bed nets (ITNs), preferably long-lasting insecticidal nets (LLINs)
- Indoor residual spraying of shelters with insecticide (IRS)
- Prevention of overcrowding.

Immunization schedule

Age	Vaccine		
Birth	BCG	OPV-0	
6 weeks	DPT+HIB-1	OPV-1	Hep B1
10 weeks	DPT+HIB-2	OPV-2	Hep B2
14 weeks	DPT+HIB-3	OPV-3	Hep B3
9 months	Measles		

Prevention of measles

Prevention of measles can be achieved by vaccination of all children from 6 months through 14 years of age if possible, with a minimum acceptable age range of 6 months through 4 years of age. Ideally, measles vaccination should happen within the first days of the emergency. Children vaccinated at the age of 6 to 9 months should be revaccinated as soon as they reach 9 months of age. All children aged 6 months to 5 years should receive vitamin A to decrease mortality and prevent complications of measles.

Routine deworming

Give every child mebendazole or albendazole every 6 months from the age of one year. Record the dose on the child's card.

Give 500 mg mebendazole as a single dose in clinic if:

- hookworm/ whipworm is a problem in your area
- the child is 1 year of age or older, and
- has not had a dose in the previous 6 months

In addition to the public health measures mentioned above, specific measures can be taken to prevent morbidity and mortality as shown below.

Prevention of diarrhea and dehydration

In addition to the general preventive measures described above, specific care must be taken by caregivers to personal hygiene such as hand washing after toileting and bathing, and before preparing food and feeding children.

Counsel mother or caretaker to start rehydration right at the onset of diarrhoea to prevent dehydration.

Prevention of acute respiratory infection (ARI)

The additional measures required to prevent respiratory infections are to minimize exposure to smoke, particularly cigarette smoke, and other air pollutants, to improve ventilation in households, respiratory etiquette (for example, covering mouth and nose with tissue when coughing or sneezing, or coughing/sneezing into your sleeve) and avoiding close contact (<1 metre) with people with respiratory illnesses (people who are coughing or sneezing), and to promote hand hygiene.

Prevention of malaria

Malaria prevention can be achieved by mosquito control. The use of insecticide-treated bed nets when sleeping are important in preventing bites. Indoor residual spraying of shelters may be indicated if the shelters are suitable for spraying. The drainage and elimination of small breeding sites, as well as environmental sanitation will also help prevent malaria control.

Prevention of severe bacterial infections

Prevention of severe bacterial infections can be achieved by vaccinating against the two most common causes of serious bacterial infections in children: *Streptococcus pneumoniae* (pneumococcal vaccine) and *Haemophilus influenzae* type b (Hib vaccine). However, these vaccines are not often available during emergencies.

Prevention of illness in the young infant age up to 2 months

The most common causes of newborn and young infant death are serious bacterial infection, premature delivery and birth asphyxia (lack of oxygen). Most newborn deaths occur in low birth weight babies. Disease in the young infant can be prevented by:

- Good antenatal care
- Clean delivery
- Clean sectioning of the umbilical cord and good umbilical stump and skin care
- Keeping the newborn warm and prevention of hypothermia through:
 - placing the newborn on the mother's chest
 - wrapping and capping to keep the baby warm
- Early and exclusive breastfeeding regularly (upon demand by the infant)
- Early recognition and treatment of illness
- Immunization (see generic schedule above for adaptation to national guidelines).

Prevention of anaemia

Anaemia can be prevented by:

- Good nutrition
- Regular de-worming starting from the age of one year
- Prevention and early treatment of malaria
- Supplemental iron.

Prevention of malnutrition and micronutrient deficiencies

Malnutrition and micronutrient deficiencies can be prevented by:

- Early and exclusive breast feeding up to 6 months of age
- Promotion of breast feeding up to 2 years at least and appropriate complementary foods
- Access to locally-available nutrient dense foods
- Education to the mother/caregiver on the preparation of nutritious meals from locally available foods.

Vitamin A supplementation

Young infants and children should be given a dose of vitamin A every 6 months from the age of 6 months up to 5 years. It is best that the Vitamin A doses are synchronised with immunization visits or campaigns.

Prevention:

- Give Vitamin A to all children to prevent severe illness:
 - First dose at 6 weeks in a child that is not being breastfed
 - First dose in breastfed children to be given any time after 6 months of age
 - Thereafter Vitamin A should be given every six months to ALL CHILDREN up to 5 years.

Treatment:

- Give an extra dose of Vitamin A (same dose) for treatment if the child has measles or PERSISTENT DIARRHOEA. If the child has had a dose of Vitamin A within the past month, DO NOT GIVE VITAMIN A.
- Always chart the dose of Vitamin A given on the child's chart.

Age	Vitamin A dose
6 up to 12 months	100 000 IU
One year and older	200 000 IU

Chapter 14

Prevention of HIV infection in children

HIV-infected and HIV-exposed children

In emergencies, it is important to address if possible the needs of children for HIV services as they are at risk of infection, malnutrition, and sexual violence.

Prevention of mother-to-child transmission (PMTCT) and HIV post-exposure prophylaxis (PEP) are secondary prevention measures that could effectively prevent transmission of HIV infection to children in emergencies.

Prevention of HIV infection

Primary prevention of HIV infection in emergencies includes standard precaution and the protection of children by providing shelter, food, education and protection from sexual violence.

Secondary prevention measures include the prevention of transmission of HIV from mother to child at delivery, and HIV post-exposure prophylaxis after exposure through sexual violence and rape or exposure to blood-borne diseases through unsafe injections or medical practices.

Prevention of HIV infection

During the acute phase of an emergency

Prevention of HIV infection in children during the acute phase of an emergency should focus on:

- Standard precautions:
 - Regular hand washing
 - Use of protective barriers (gloves, gowns, masks, face shields) to prevent direct contact with/or splashing of blood and body fluids
 - Avoidance of unnecessary procedures:
 - Limiting blood transfusions to a minimum and using other intravenous replacement fluids
 - Using oral medicines instead of intravenous or intramuscular treatments when possible
 - Safe handling and disposal of sharp objects
 - Safe decontamination of instruments
 - Safe disposal of contaminated waste using heavy-duty gloves and washing hands after handling waste.

- Safe blood supply
 - Potential blood donors should be counseled and educated about appropriate blood donation.
 - Blood should be obtained from voluntary / unpaid donors.
 - Blood should be screened for HIV, hepatitis B and, if possible, hepatitis C and syphilis prior to use.

- Promotion of safe deliveries by:
 - Using a clean delivery kit or midwife delivery kit
 - Using standard precautions
 - Avoiding unnecessary invasive procedures during delivery.

- Prevention of sexual abuse and violence against children and women

People in contact with children should be educated on the risk to vulnerable groups and know where to send and how to care for children who have been raped or abused (Clinical management of rape victims guidelines Inter-agency).

After the acute phase of an emergency

After the acute phase of an emergency, additional community-level efforts to prevent HIV infection may be feasible and targeting high risk groups of children:

- Children in female-headed or child-headed households
- Orphans and unaccompanied children

Prevention efforts include:

- Vulnerable groups of children should be located in a safe place in the camp.
- Unaccompanied children and orphans should be registered and efforts made to trace and reunify them with their families.
- Educational efforts should spread the facts about HIV transmission and dispel myths to reduce some of the stigma against people living with HIV.
- Livelihood support should be provided for vulnerable groups and people living with HIV
- Support groups should be set up for vulnerable groups and people living with HIV.
- Vitamin A supplementation for all children and school feeding are general ways to support children, including those with HIV infection or those children exposed to HIV.

Prevention of mother-to-child transmission (MTCT) of HIV infection

Without any intervention, the risk of transmission of HIV from an infected mother to her child is 15 to 45%. This risk can be substantially reduced through a package of interventions that includes prophylactic antiretrovirals (ARVs) to the mother and/or her infant, infant feeding counseling and support, and safer delivery practices. All HIV-infected mothers and their infants also need long-term care and support, including antiretroviral therapy, if eligible. However, it is not always possible to provide a full package of care in emergency situations.

- Voluntary and confidential counseling and testing (VCT) services need to be available and offered systematically with appropriate counseling as one of the first priorities in efforts to prevent maternal-to-child transmission of HIV as it is necessary to know a woman's HIV status in order to provide antiretroviral treatment or prophylaxis.
- All women, but especially those who are suspected of having HIV infection, should be provided with a package of services to ensure the continuum of care:
 - sexual and reproductive health services including family planning
 - cotrimoxazole prophylaxis
 - antiretroviral therapy when eligible
 - nutritional support, including multivitamin supplement during pregnancy and lactation.
- Depending on the level of services, different antiretroviral treatment regimens may be appropriate (see the current WHO and/or national guidelines).
- HIV infected women may need cotrimoxazole and a secure supply of antiretrovirals if they were previously on antiretroviral treatment.
- Pregnant HIV infected women not on antiretroviral therapy should receive appropriate care and be evaluated for their need of antiretroviral treatment or antiretroviral prophylaxis to prevent transmission of HIV to the baby during the delivery.
- Malaria treatment or prophylaxis is also important for pregnant women, especially those with HIV infection, as it can result in severe disease in the mother and fetus.
- All women should receive counseling on infant feeding:
 - For HIV-negative women and women who do not know their status, they should be encouraged to exclusively breastfeed for the first six months, and to continue breastfeeding up to 2 years or beyond with complementary feeding.
 - If an HIV-infected woman can safely practise replacement feeding (meaning it is acceptable, feasible, affordable, sustainable and safe for the individual woman), then avoidance of all breastfeeding is advisable. Such conditions are unlikely to be in place for many women in emergencies. Otherwise, exclusive breastfeeding for the first few months is recommended, until safe conditions are in place to stop breastfeeding completely and switch to replacement feeding. Exclusive breastfeeding is only recommended up to six months, but some women may be able to stop sooner or may have to continue after six months, with complementary feeding. Other options may also be acceptable, such as expressing and heat-treating breast milk or wet-nursing by an HIV-negative woman.
- Breastfeeding can be made safer by:
 - Shorter duration – 6 months and then rapid cessation
 - Heat treatment of expressed breast milk
 - Avoiding feeding from a breast with a cracked bleeding nipple or abscesses
 - Prompt treatment of oral thrush.
 - Not mixing feeds, that is, giving water, other milks or foods along with breast milk below six months.
 - Encouraging condom use during lactation to prevent primary infection with HIV during the lactation period.

- Breastfeeding counseling and education depend on certain key factors:
 - The availability of voluntary counseling and testing
 - The availability of safe, sufficient amounts of water to make up a milk substitute
 - A place to prepare the breast milk substitute
 - The family's economic resources to obtain breast milk substitute.

If any of these factors cannot be met, then women should be counseled to exclusively breastfeed for 6 months.

HIV post-exposure prophylaxis (PEP)

When available, post-exposure prophylaxis (PEP) should include children because children and young adolescents are at great risk of sexual violence during emergencies. Appropriate and locally-adapted care support and follow-up structures for children and young adolescents should be available. PEP should be an option whenever the child has been raped or exposed to blood-borne infections due to unsafe injection or medical practices.

Chapter 15

Mental health and psychosocial support

When children have been exposed to traumatic or psychologically wounding events (defined as '*events beyond the normal boundaries of human experience*') different kinds of stress reactions can become apparent. This is a normal human reaction to abnormal distressing events. When there is an accumulation of distressing experiences, or if children face chronic stress, there is a real threat to their long term development. Most long term effects are most likely to have their roots in the loss of the child's close emotional relationships and the events surrounding that loss. Fortunately, in most cases, many stress reactions disappear over time. But some children do better than others in withstanding these shocks and it has often been noted that those who belong to caring and supportive families withstand severe psychological stress better than others. Stable, affectionate relationships between children and their closest caregivers are a protective factor against psychological disturbance, especially if the adults are able to maintain their caring roles. Those who can make some sense of the situation they are in also appear to cope better than those who cannot. Communicating to children what is happening around them in language suited to their level of development is critical. Unfortunately, often carers fail to detect the symptoms of psychological distress, either ignoring, rejecting or punishing the child in response to the behaviour changes they see.

Assess the child in need of mental health or psychosocial support

When children face any traumatic event, they have both emotional and physical reactions. These reactions and feelings are normal responses and occur in most children who face an event that overwhelms them. Parents, teachers, and other caregivers must be encouraged to keep a watch on children and observe any changes in them. Children in this age bracket tend to be strongly affected by the parents' reactions to the traumatic event. Pre-school children have an incomplete understanding of death.

Typical stress reactions for young children include:

- crying
- whimpering
- screaming.

Non-verbal signs of psychological stress include:

- trembling
- frightened facial expressions
- helplessness and passivity (manifested by a fear of being separated from the parent)
- immobility and/or aimless motion
- excessive clinging
- total withdrawal
- regressive behaviors (thumb-sucking, bed-wetting, fear of darkness)

- not understanding that the immediate danger is over
- feeling magically that what happened is a punishment for something they have done or thought.

It may be useful to observe children of the same age group in order to assess whether the child in question is indeed demonstrating unusual behaviour as compared to the other children.

Classify the child in need of mental health or psychosocial support

Children with a need for PSYCHOSOCIAL SUPPORT will show signs of:

- Helplessness and passivity
- Generalized fear
- Cognitive confusion
- Difficulty identifying what is bothering them
- Lack of verbalization
- Attributing magical qualities to traumatic reminders
- Sleep disturbances
- Anxious attachment
- Regressive symptoms
- Symptoms that interfere with the daily routines of the child
- Worsening symptoms
- Symptoms that are highly distressing for the child or its family.

Management of the young child in need of mental health or psychosocial support

Providing psychosocial support to a child towards recovery from a traumatic event involves:

- understanding the child's emotional reactions through observation and monitoring
- decreasing emotional distress by listening, reassuring, and modelling healthy behaviour for the child
- facilitating recovery by normalizing life routines, providing a space for the child to talk about his or her feelings, and providing opportunities for the child to engage in play and other recreational activities.

Talking about the event and allowing children to share their experiences and feelings may help to decrease emotional distress. Caregivers must be encouraged to be available for children possibly in a clearly defined space where the child can talk openly. This will rebuild children's trust in people and help them feel cared for and secure. It is important to be there for children if they want to talk, but children must NOT be pushed to talk. Children may not talk at all but may find it comforting to know that there are people around who care. It is important to avoid flooding children with advice – giving children space but not imposing ideas on how to behave or react. Listening to their feelings and re-assuring them that it is common to feel the way they do after such an event is helpful. Being available and offering reassurance to children can help restore a greater sense of safety and security.

Children can often be confused about what can help them. The first task is to normalise their life routines, establishing daily routines as soon as possible, helping them get involved in routine tasks like returning to pre-school or engaging in recreational activities. Children will look to caregivers to learn how to cope with these incidents/events. Caregivers must try to model healthy coping by acting with calmness, following regular sleep times, eating well, taking an interest in outside activities, and exercising regularly. This lifestyle can enable children to also develop these healthy coping strategies. Children will realize that adults have normalized their life and will be motivated to do the same.

Children’s reactions vary by age. In the table below, common reactions found in the young age group are provided along with suggested strategies for providing support. Some of the interventions are relevant to all providers of care for children, while others are more specifically targeted at parents. The interventions aim to enhance children’s feelings of protection and security, sense of control, facilitate attachment to caregivers and peers, and increase a sense of belonging to a wider cultural community. Finally, it should be noted that distress levels among pre-school children often depend on the response and level of distress of the parents. Providing support for parents will also help to reduce distress in pre-school aged children. For infants, breastfeeding should be encouraged.

Reactions/behaviours								
Helplessness and passivity	Generalized fear	Cognitive confusion	Difficulty identifying what is bothering them	Lack of verbalization	Attributing magical qualities to traumatic reminders	Sleep disturbances	Anxious attachment	Regressive symptoms
Suggested support/interventions								
Provide support, rest, comfort, food, opportunities to play and	Presence of calm, supportive adult caregivers	Give repeated, concrete clarifications	Provide emotional labels	Verbalize common feelings and complaints	Separate what happened to them from physical reminders	Give the child extra time and reassurance at bedtime	Provide consistent care and reassurance	Tolerate symptoms in a time-limited manner
Examples of how to implement interventions								
Establish a “child friendly space”	Safety hand exercise	Provide information in simple language	Provide art and play materials for children	Shield children	Plan calming activities before bedtime	Establish a routine	Allow the child privacy, but not isolation	

Annex 1

Glossary

Acute Abdomen: A serious condition of the abdomen requiring urgent surgery. Examples include appendicitis and massive bleeding from injuries.

Antidote: A medicine given to treat a specific type of poisoning.

Antipyretic: A medicine given to reduce fever.

Capillary refill: The amount of time it takes for the pink colour to return after applying pressure to whiten the nail of the thumb or big toe for 3 seconds.

Central cyanosis: A bluish or purplish discoloration of the tongue and the inside of the mouth that indicates poor oxygenation.

Cerebrospinal fluid: The fluid surrounding the brain and spinal cord.

Chest indrawing: Inward movement of the lower chest wall when the child breathes in and a sign of respiratory distress. Chest indrawing does not refer to inward movement of the soft tissue between the ribs.

Congestive heart failure: Failure of the heart to transport blood to the body's tissues because of too much fluid.

Cornea: The transparent tissue that forms the front part of the eye.

Croup: A viral infection causing obstruction of the upper airway and stridor.

Falciparum malaria: Malaria due to *Plasmodium falciparum*, the most deadly form of malaria in children.

Grunting: A forced expiratory sound made by young infants in respiratory distress.

Kwashiorkor: A form of severe malnutrition characterized by oedema of both feet.

Lethargy: Reduction in the level of alertness and activity.

Marasmus: A form of severe malnutrition characterized by wasting.

Meningitis: Inflammation surrounding the brain or spinal cord, often due to bacterial infection.

Nasal flaring: Widening of the nostrils during inspiration and a sign of respiratory distress.

Oedema: Swelling of the tissues due to build up of fluid.

Palmar pallor: Pale or white color of the skin of the palm when the gently opened palm of the child is compared to the examiner's palms. Palmar pallor may indicate severe anaemia.

PCV (packed cell volume): A measure of the amount of red blood cells in the blood and thus a measure of anaemia.

Pupil: The circular opening in the center of the eye.

Pustules: A lesion or bump on the skin containing pus.

RDT: Rapid Diagnostic Tests for the diagnosis of malaria when microscopy is not available.

RUTF: Ready-to-Use Therapeutic Food

Sepsis: The presence of organisms or their toxins in the blood leading to severe illness.

Skin Turgor: The ability of the skin to return to normal position that is decreased by dehydration. Skin turgor is assessed using the pinch test.

Stridor: A harsh noise during inspiration due to narrowing of the air passage.

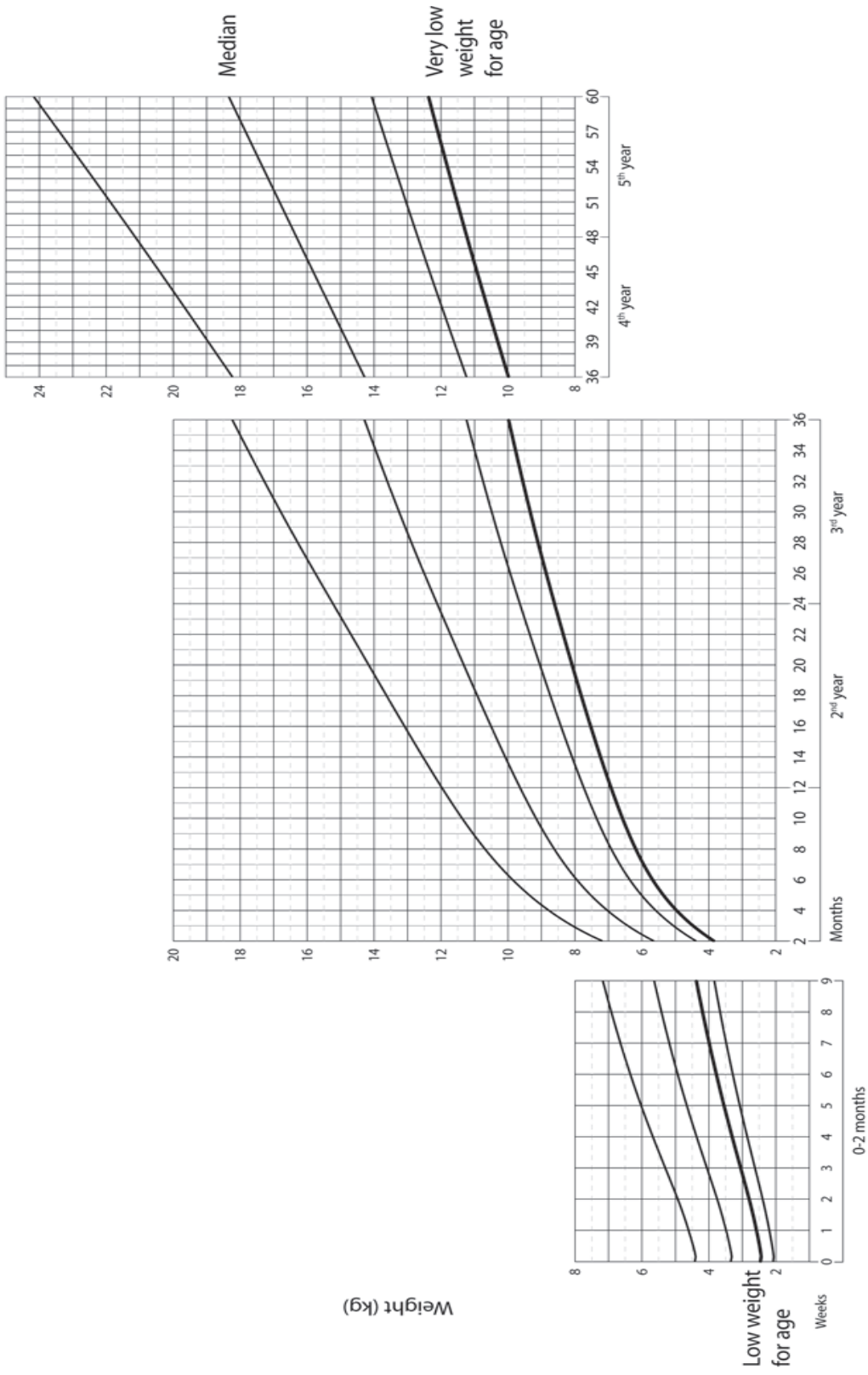
Triage: The sorting of children into priority groups according to their medical need and the resources available.

Urethra: The tissue leading from the bladder to the outside through which urine exits the body.

Vernix: The creamy white coating on the skin of a newborn baby.

Wheezing: A high-pitched whistling sound near the end of expiration due to narrowing of the airways in the lung.

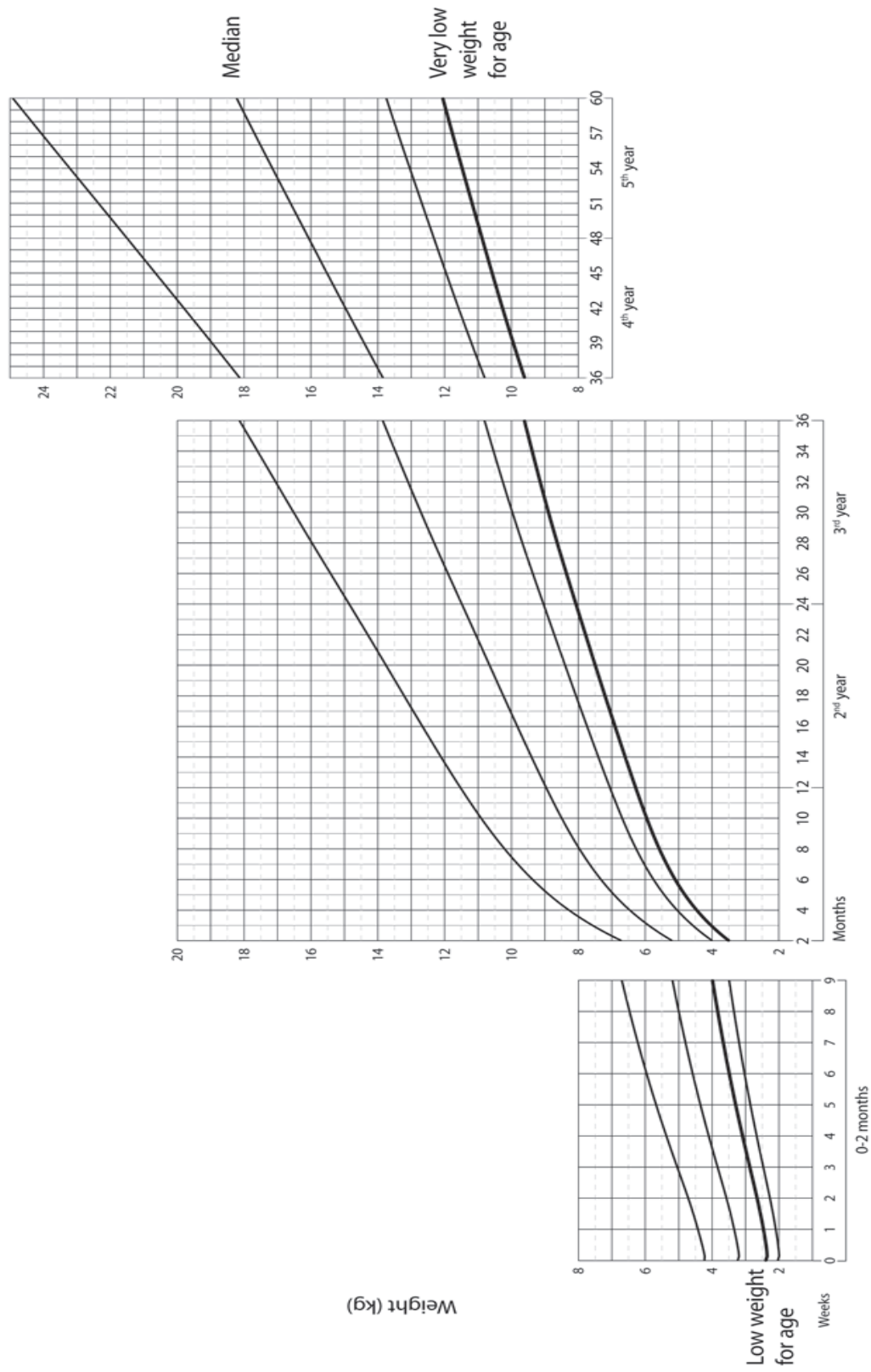
Weight-for-age chart for boys



Age (completed weeks and months)

Annex 2 Weight-for-age chart

Weight-for-age chart for girls



Age (completed weeks and months)

Annex 3

Chapter resources

Introduction

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Annex 4

Drug dosages for children (Formulary)

Medicines	Dosage	Form	Dose according to body weight (calculate if weight is below or over)				
			3-6 kg	6-10 kg	10-15 kg	15-20 kg	20-29 kg
albendazole	200 mg (half tablet) 12-24 months 400 mg (one tablet) over 24 months	chewable tablet, 400mg	-	-	1	1	1
amodiaquine	10 mg base/kg/3 days (total dose 30 mg base/kg)	tablet, 200mg	-	-	1	1	1
amoxicillin	15 mg/kg/dose for 7 days non-severe pneumonia: 25 mg/kg 2 times per day for 3 days	tablet/capsule 250 mg oral suspension, 125mg/5ml tablet/capsule 250 mg oral suspension, 125mg/5ml	¼ 2.5 ml ½ 5 ml	½ 5 ml 1 10 ml	¾ 7.5 ml 1½ 15 ml	1 10 ml 2 -	1½ - 2½ -
ampicillin	IM 50 mg/kg/6 hours	Vial of 500 mg mixed with 2.1 ml sterile water to give 500 mg/2.5 ml	1 ml	2 ml	3 ml	5 ml	6 ml
artemether	IM 3.2 mg/kg once on day 1 then IM 1.6 mg/kg daily until oral therapy is possible, total therapy one week	injection, 40mg/ml in 1ml ampoule injection, 80mg/ml in 1ml ampoule					see Chapter 5, management of the child with malaria
artemether + lumefantrine	fixed dose treatment (20+120 mg) twice daily for 3 days	tablet 10+120 mg					see Chapter 5, management of the child with malaria
artesunate	severe malaria: IV or IM 2.4 mg/kg over 3 minutes at 0, 12 and 24 hours on day 1. then continue with 2.4 mg/kg over 3 minutes on day 2 until oral therapy is possible If/when possible change to oral 2 mg/kg total treatment one week. uncomplicated malaria falciparum: oral 4 mg/kg/day for 3 days combined with mefloquine, sulfadoxine-pyrimethamine or amodiaquine.	vial of 60 mg in 0.6 ml with 3.4 ml water or saline to give 60 mg/4 ml vial of 60 mg in 0.6 ml with 3.4 ml water or saline to give 60 mg/4 ml tablet, 50mg tablet, 50mg					see Chapter 5, management of the child with malaria
benzathine benzylpenicillin	IM 1.2million units over 5 years, 0.6 million units below 5 years	vial of 1.2 million units in 4 ml					
benzylpenicillin	IM 60 mg/kg/6 hours	vial of 600 mg mixed with 9.6 ml sterile water to give 600 mg /10 ml	4 ml	8 ml	12 ml	18 ml	25 ml
ceftriaxone	IM IV 50-100 mg/kg for 2 to 5 days	vial of 1 g mixed with 9.6 ml sterile water to give 1 g/10 ml	4 ml	8 ml	12 ml	18 ml	25 ml

Medicines	Dosage	Form	Dose according to body weight (calculate if weight is below or over)					
			3-6kg	6-10 kg	10-15 kg	15-20 kg	20-29 kg	
charcoal, activated	under 1 year 1 g/kg, over 1 year, 25-50 g/kg	tablets						
chloramphenicol	IM 25 mg/kg/6 hours maximum dose 1 g oral 50 mg/kg every 8 hours	vial 1 g/ 10 ml capsule, 250 mg	Calculate exact quantity required: 0.25 ml contains 25 mg					
chlorhexidine cetrimide solution	20 ml made up to 1 l with clean water	oral suspension, 150 mg/5 ml solution, 5% for dilution	3-5 ml	6-9 ml	10-14 ml	15-19 ml	-	-
chloroquine	10 mg base once daily for 2 days then 5 mg base/kg on day 3 (in chloroquine-sensitive areas)	tablet, 100mg,	1/2	1	1 1/2	2	2	2 1/2
		tablet, 150mg	1/2	1/2	1/2	1	1	1
		syrup, 50mg/5ml	-	1/2	1	1 1/2	1 1/2	1 1/2
		tablet 100 mg	-	1/2	1	1	1	1
		capsule, 150 mg	5 ml	7.5 ml	15 ml	-	-	-
		vial 5 mg/ 1 ml	2.5 ml	5 ml	10 ml	-	-	-
		vial 10 mg/ 2 ml	1/2	1	1 1/2	2	3	3
		vial 10 mg/ 2 ml	-	-	-	-	-	1
		vial 10 mg/ 2 ml	0.5 ml	0.9 ml	1.4 ml	2 ml	2 ml	3 ml
		vial 10 mg/ 2 ml	0.4 ml	0.75 ml	1.2 ml	1.7 ml	2.5 ml	2.5 ml
		vial 10 mg/ 2 ml	0.25 ml	0.4 ml	0.6 ml	0.75 ml	1.25 ml	1.25 ml
		vial 10 mg/ 2 ml	0.1 ml	0.2 ml	0.3 ml	0.4 ml	0.6 ml	0.6 ml
dihydro artemisinin + piperakin (artekin)*	fixed dose treatment, 3 or 4 doses over 3 days	vial 10 mg/ 2 ml	0.1 ml	0.2 ml	0.3 ml	0.4 ml	0.6 ml	0.6 ml
doxycycline	oral, not below 8 years	capsule or tablet, 100mg						
erythromycin	oral, 12.5 mg/kg 4 times daily for 3 days	capsule or tablet, 250mg	1/4	1/2	1	1	1 1/2	1 1/2
ferrous sulphate + folic acid	oral 3 mg Fe/kg/day	oral solution 20 mg/ml iron	1 ml	1.25 ml	2 ml	2.5 ml	4 ml	4 ml
furazolidone*	oral, 1.25 mg/kg 4 times daily for 3 days	tablet, 100 mg	-	-	1/4	1/4	1/4	1/4
furosemide	IV 1-2 mg/kg every 12 hours	vial, 10 mg/ml	0.8 ml	1.6 ml	2.4 ml	3.4 ml	5 ml	5 ml
gentamicin	IM 7.5 mg/kg once daily	vial 10 mg/ml	Calculate exact quantity required: 0.1 ml contains 7.5 mg					

Medicines	Dosage	Form	Dose according to body weight (calculate if weight is below or over)
			3-6 kg 6-10 kg 10-15 kg 15-20 kg 20-29 kg
gentian violet (methylrosanilinium chloride)	1 teaspoon in 1 litre of clean water	aqueous solution 0.5%	
glucose (dextrose)	5 ml/kg of 10%, or 1 ml/kg of 50% by slow push	injectable solution 10% isotonic injectable solution 50% hypertonic	
Ipecacuanha, pediatric	6-24 months 10 ml, over 24 months 15 ml in case of poisoning for inducing vomiting	oral solution	
mebendazole	NB over 12 months ONLY and if not treated in previous 6 months 100 mg 2 times per day for 3 days, or: 500 mg once only	chewable tablet, 100mg	
mefloquine	25 mg/kg once (or as 15 mg/kg then 12-24 hours later 10 mg/kg) NB not under 5 months!	tablet, 250mg (as hydrochloride)	
morphine	NB dosage must be calculated exactly! oral 0.2-0.4 mg/kg 4-6 hourly, increase if necessary for severe pain IM 0.1-0.2 mg/kg 4-6 hourly IV 0.05-0.1 mg/kg 4-6 hourly infusion 0.005-0.01 mg/kg/hour	oral solution 10 mg/5 ml; injection 10 mg in 5 ml ampoule	Calculate exact quantity required
oral rehydration salts (ORS)	plan A: after each loose stool: up to two years 50-100 ml after each loose stool, over two years 100-200 ml plan B: first 4 hours	ORS solution	200-400 ml 400-700 ml 700-1000 ml 1000-1400 ml
oxygen			
paracetamol	10-15 mg/kg, up to 4 times per day	tablet 100 mg tablet 500 mg	- 1 1 1 - ¼ ¼ ¼ ½
paraldehyde*	IM 0.2 mg/kg max 10 mg rectally 0.4 ml/kg (with blunt syringe)	vial 5 ml vial 5 ml	0.8 ml 1.5 ml 2.4 ml 5 ml 1.6 ml 3 ml 4.8 ml 10 ml
phenobarbital	convulsions: IV or IM 20 mg/kg if convulsions continue: 10 mg/kg after 30 minutes	vial 200 mg/ml vial 200 mg/ml	Calculate exact quantity required: 0.1 ml contains 20 mg Calculate exact quantity required: 0.05 ml contains 10 mg
pivmecillinam*	oral, 20 mg/kg (max 300 mg) 4 times daily for 5 days	tablet, 200 mg	½ ¾ 1 2
procaine penicillin	burns: IM 100,000 IU/kg/day for 7 days	vial 3 million units in 4 ml water	0.5 ml 1 ml 1.6 ml 3.5 ml
benzylpenicillin	stridor: IM 50,000 IU/kg/day for 7 days	vial 3 million units in 4 ml water	0.35 ml 0.5 ml 0.8 ml 1.7 ml

Medicines	Dosage	Form	Dose according to body weight (calculate if weight is below or over)				
			3-6 kg	6-10 kg	10-15 kg	15-20 kg	20-29 kg
quinine	total max one week, oral preferred, minimal 3 IV doses before changing to oral medication loading dose: IV 20 mg salt/kg over 4 hours once in 5-10 % dextrose or 0.9% saline to 10 ml/kg maintenance doses: IV 10 mg salt/kg over 4 hours three times daily for 4 days in 5-10 % dextrose or 0.9% saline to 10 ml/kg maintenance dose: oral 10 mg salt/kg three times daily	vial 150 mg/ml	0.6 ml	1.2 ml	2 ml	2.4 ml	4 ml
Ringer's lactated solution	20 ml/kg, maximum two times 20 ml bolus severe dehydration : under 1 year 100 ml of which 30 ml in first hour, rest over 5 hours, over 1 year up to 5 years total 100 ml of which 30 ml in 30 minutes then rest on 2.5 hours	injectable solution	0.3 ml	0.6 ml	1 ml	21.2 ml	2 ml
salbutamol	if child wheezes or coughs at night 1 puff (demonstrate proper use to caregiver)	inhalation (aerosol), 100micrograms (as sulfate) per dose	-	-	½	½	1
silver sulfadiazine	topical preparation for burns	cream 1% in 500 g container					
sodium chloride (saline)		injectable solution, 0.9% isotonic (equivalent to Na+ 154mmol/l, Cl- 154mmol/l)					
sulfamethoxazole + trimethoprim (cotrimoxazole)	oral PCP prophylaxis						
tetracycline	eye ointment	eye ointment, 1% (hydrochloride)					
vitamin A (retinol)	50.000 IU under 6 months, 100.000 IU over 6 months 200.000 IU over 2 years and adults measles two doses, on day 1 and 2 malnutrition one dose on day 1	tablet 50.000, 100.000 or 200.000 units					
vitamin K (menadiol)*	according to national guidelines	vial 1 or 2 mg/ml					
zinc sulfate	10 mg/day under 6 months 20 mg/day over 6 months	tablets, 20 mg					

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