

The MalariaCare Toolkit

Tools for maintaining high-quality malaria
case management services

Continuing malaria education modules

Module 1 Severe malaria—triage, diagnosis, and treatment

Download all the MalariaCare tools from: www.malariacare.org/resources/toolkit.



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Module 1: Severe malaria—triage, diagnosis, and treatment

In its continuous quest to improve the quality of malaria case management, both diagnosis and treatment, as well as management of complications within the context of febrile disease, MalariaCare has developed different continuous training and mentoring modules for health providers at the health facility level. The purpose of the modules is to update knowledge and train those who never had a chance to receive training in malaria case management. This document is aimed at supervisors, to help you conduct supervision, on-the-job training, and mentorship of providers.

The case studies, pictures, questions, and answers in this module are designed to help you have short, instructive conversations about specialized medical topics with the clinical staff you supervise. Some topics, like severe malaria, generally do not receive enough emphasis during standard clinical education and training. The staff you supervise therefore may have very little understanding about such important issues. Spending some time discussing case studies with your staff during standard outreach training and supportive supervision (OTSS) visits will help you assess how much they already know and will highlight where they need your help to increase knowledge and skills.

The questions and answers are not a script for you to read. You will be most effective talking about these issues in your own way. They are there primarily as reminders and to help keep the conversation moving.

You may wish to allocate approximately 20 minutes for your case study review and conversation during the OTSS visit. The tone and length of the conversation will depend on how well the clinician already understands the issue. If she or he has good understanding, you will be able to move through the case study questions quickly and you may complete the module in a single visit. However, if the clinician needs more explanation, you should spend more time on each case study, and you may need to go through the module over the course of several visits.

As you discuss each case study, include these general questions:

- What are the advantages of responding to the case in the way that we have discussed?
- Are there any barriers or problems you might face with that response?
- What could you do to reduce or eliminate the problems?

Enjoy your conversations!

Triage: Seeing the most serious cases first

1. After the recent death of an ill child in the waiting area, you instituted a new policy to have intake screening for patients who appear seriously ill (triage). What signs should staff look for to determine if a child should be evaluated right away?

Allow the clinician time to respond.

CORRECT RESPONSES:

- a. **Convulsions.**
- b. **Fast breathing.**
- c. **Listlessness.**
- d. **Inability to interact with caregiver.**
- e. **Unable to feed/eat.**

Points to emphasize:

- These are all signs of severe disease that can easily be seen at patient check-in, or by surveying patients in the waiting room. Visual evaluation should be done on arrival and at several intervals throughout the day to make sure that seriously ill patients don't wait.
- When comprehensive emergency triage assessment and treatment trainings occur, all facility staff must be made aware of the new triage system (including security guards, receptionists, gardening staff, etc.), and a system should be in place for them to alert clinical staff immediately.
- Laboratory staff also should check for signs of severely ill patients in their waiting rooms several times a day.

2. As part of your new protocol, your medical assistant tells you that a two-year-old male child has just arrived who appears to be unusually listless. However, five other patients arrived first. What should you do?

Multiple choice: Read the three possible answers out loud.

- a. See patients in the order that they arrived to be fair to them all.
- b. Quickly see the five patients in front of the lethargic child, so that he/she does not wait too long.
- c. Move the child to the front of the queue and evaluate immediately.

CORRECT RESPONSE: c. Move the child to the front of the queue and evaluate immediately.

Points to emphasize:

- According to the World Health Organization Emergency Triage Assessment and Treatment guidelines, patients are classified as Emergency, Priority, or Non-urgent.
- Emergency patients (such as those with severe malaria) are much more likely to die if not attended to immediately. They must be properly diagnosed, treated, and/or referred as necessary, and any complications must be identified.
- Rapidly screening and diagnosing, and then providing appropriate treatment, will help you save lives.
- The key interventions are: check blood glucose, check for evidence of dehydration/lactic acidosis (rapid heartbeat, rapid breathing, and low blood pressure), check for evidence of altered mental status, check for abnormal bleeding, and check hemoglobin.
- If the clinic does not have facilities to do these assessments, it is crucial to give IM or rectal pre-referral medications and to ACTIVELY arrange referral.

Further discussion about triage

- Based on what we've just discussed, what is triage?
- Why is triage important?
- How do we do better triage? Is this sometimes a challenge? Why?
- Whose responsibility is triage?
- Is there an emergency triage assessment and treatment system in place here? If not, what are the barriers to setting up such a system?
- Emphasize the benefits of triage:
 - If you're timely/you catch people early, you can help identify sick children early, check blood glucose, identify malaria infection early, and start intravenous fluids and treatment. These interventions save lives!

Is it malaria or something else?

3. The mother tells you that the child has had a fever for three days. She reports that he has not been feeding well, had a seizure overnight, and has not been making urine. The child has received all his immunizations. What could be causing this child to have a fever and other symptoms?

Allow staff time to respond.

CORRECT RESPONSES: malaria, meningitis, and/or another severe infection.

Points to emphasize:

- Explain that while there may be a lot of malaria in the area, other types of infection also can cause patients to become severely ill.
- Discuss the relevant diseases in your area.
- An average of 10 percent of patients with malaria have a serious bacterial co-infection.

4. The same child's temperature is 39°C. What is the next step you should take?

Multiple choice: Read the possible answers out loud.

- a. Give the mother a prescription for an antimalarial, antibiotic, or paracetamol.
- b. Perform a rapid physical exam.
- c. Perform a diagnostic test.
- d. Send the patient to a referral facility.

CORRECT RESPONSE: b. Perform a rapid physical exam.

Points to emphasize:

- Explain to the provider that while performing a diagnostic test, giving medicine, and referring are all important actions to take with severely ill patients, a rapidly performed physical exam can identify other possible causes of disease and complications and, more importantly, can distinguish between who is severely ill and who is not.
- The exam should focus on signs of poor breathing (fast or shallow breathing, grunting respirations, blue lips or tongue) and poor circulation (cold hands, capillary refill more than three seconds) to determine if the patient needs simple and immediate interventions such as oxygen and intravenous fluids.

The physical exam

5. You ask the mother to undress the child so you can perform a physical exam. In addition to the signs of poor breathing and circulation that we've talked about, what other important signs can be detected during the physical exam that may indicate that the child is severely ill?

CORRECT RESPONSES:

Explain the ones that are not mentioned by the provider and what they might indicate.

- **Prostration, obtundation, or coma:** The child does not respond by crying or moving his arms and legs in a purposeful way when you examine him. This could represent meningitis, cerebral malaria, hypoglycemia, severe dehydration, and septic shock.
- **Posturing:** Cerebral malaria or other serious cerebral dysfunction.
- **Palmar or conjunctival pallor:** Anemia.
- **Icteric or yellow eyes:** Hemolytic anemia or liver dysfunction.
- **Sunken eyes or persistent skin fold:** Dehydration.
- **Convulsions:** Meningitis, cerebral malaria, or high fever.
- **Fast breathing:** This can be due to many causes, including pneumonia, sepsis, respiratory failure from malaria or other severe infection, metabolic acidosis, or a foreign body.
- **Neck stiffness:** Meningitis.
- **Signs of bleeding or clotting:** Disturbances, any active bleeding, ecchymosis/bruising, petechial rash.

Other tests

6. You notice that the child is obtunded and feels warm. What is the first test you should order?

CORRECT RESPONSE: A rapid diagnostic test (RDT). Microscopy would be acceptable only if it can be done and read in less than 20 minutes, the maximum time it takes to get an RDT result.

If the provider indicates another test, emphasize why it is important to first distinguish between malaria and other types of infection in an area that is highly endemic.

Point to emphasize:

- There are many other reasons for fever. Discuss other types of diagnostic tests that the clinician could order for common causes of fever. Talk both about causes that can be diagnosed with tests that might be available in an outpatient setting (urinalysis and lumbar puncture), and stress that diagnosis of common viral illnesses, diarrhea, or pneumonia (the three causes that the clinician is going to see the most) is based not on a diagnostic test but on clinical presentation.

Diagnosis and treatment

7. The RDT is positive for malaria. What is your diagnosis? What is the next thing you should do?

CORRECT RESPONSE: The diagnosis is severe malaria (but list differential diagnosis still).

Treatment: Give the patient an antimalarial.

Emphasize that for severely ill patients, depending on what you see, time is critically important and immediate treatment is crucial.

Consider having a broader discussion about immediate treatments, some of which are discussed below, such as dextrose, anticonvulsant medications, oxygen, antibiotics, or antipyretics.

8. If your center does not have hospitalization facilities, what additional steps should you take?

CORRECT RESPONSE: Give a pre-referral antimalarial treatment, according to national guidelines, and an antibiotic. Perform additional diagnostic tests (if available and if this will not take too much time) and arrange referral.

Explain why:

- Give antibiotic: Hard to distinguish clinically if there is co-infection.
- Perform additional diagnostic tests: There are complications of severe infection, particularly hypoglycemia, which can be corrected quickly. The World Health Organization (WHO) recommends that these additional tests be conducted, if possible:
 - HCT or Hgb.
 - Blood glucose level.
 - Lumbar puncture: Add when able.
 - Blood cx when feasible.
- Take emergency measures: These might include:
 - Making sure patient has a patent airway and give oxygen therapy.
 - Treating seizures with diazepam or other benzodiazepine.
 - Treating hypoglycemia.
 - Providing fluid resuscitation—oral or intravenous—if there is evidence of lactic acidosis and/or dehydration.
 - Treating fever with paracetamol.
 - Treating with rectal/parenteral antimalarial and antibiotic.
- Refer: This patient has symptoms and signs of severe illness and should be admitted to an inpatient ward. Emphasize why simply counseling the patient to return if the patient worsens is not enough because of the risk of mortality and neurologic sequelae.

Signs of severe malaria

Discuss these signs and symptoms of severe malaria, as defined by the WHO. This table comes from the WHO publication *Management of Severe Malaria: A Practical Handbook*.¹

Table 1: Signs and symptoms of severe malaria in adults and in children^a

Sign or symptom	Adults	Children
Duration of illness	5–7 days	Shorter (1–2 days)
Respiratory distress/ deep breathing (acidosis)	Common	Common
Convulsions	Common (12%)	Very common (30%)
Posturing (decorticate/decerebrate and opisthotonic rigidity)	Uncommon	Common
Prostration/obtundation	Common	Common
Resolution of coma	2–4 days	Faster (1–2 days)
Neurological sequelae after cerebral malaria	Uncommon (1%)	Common (5–30%)
Jaundice	Common	Uncommon
Hypoglycaemia	Less common	Common
Metabolic acidosis	Common	Common
Pulmonary oedema	Uncommon	Rare
Renal failure	Common	Rare
CSF opening pressure	Usually normal	Usually raised
Bleeding/clotting disturbances	Up to 10%	Rare
Invasive bacterial infection (co-infection)	Uncommon (<5%)	Common (10%)

^a Derived from studies in south-east Asian adults and children, and African children.^{6,7}

Note: CSF, .

¹ World Health Organization (WHO). *Management of Severe Malaria: A Practical Handbook*. 3rd ed. Geneva: WHO; 2012

Complications of malaria

9. What complications of malaria could be causing the obtundation, and what other physical exam signs could indicate each complication?

CORRECT RESPONSES:

Explain the ones that are not mentioned by the provider and what they might indicate.

- **Cerebral malaria:** Opisthotonus, conjugate deviation of the eyes, sluggish pupillary responses, convulsions.
- **Severe dehydration:** Sunken eyes, the skin takes longer than 2 seconds to go back down after pinching, dry mucous membranes.
- **Hypoglycemia.**
- **Severe anemia:** Palmer or conjunctival pallor, icterus.

10. If they are available, what other tests should be performed?

CORRECT RESPONSES: Hemoglobin (to assess for anemia), blood sugar (to assess for hypoglycemia), and lumbar puncture (to assess for meningitis).

There may be other acceptable answers based on the capabilities of the facility, but it should be emphasized that for patients being referred somewhere else, other commonly performed tests should not delay treatment and referral. Referral may not be useful at all if the provider can't share the results with the referral facility—CBC, chem, UA, etc.)

11. *If the facility has dextrostix:* You perform a test for blood sugar and find that it is 2.0 mmol/L. What should you do?

CORRECT RESPONSE: Give dextrose orally or intravenously if it will not delay referral (proper dosing).

12. *If blood sugar evaluation is performed in the lab:* Your lab typically takes over one hour to perform the blood sugar test, and it will take the mother one hour to get to the referral facility. What should you do?

Multiple choice: Read the possible answers out loud. Mention that more than one answer may be correct.

- Order the diagnostic tests and wait for the results.
- Refer immediately.
- Send the diagnostic tests, refer, and call the referral facility with the results.

- d. Treat presumptively for hypoglycemia and send to the referral facility.

CORRECT RESPONSES: b, c, or d may be correct, depending on transportation, communication, and national guidelines. Answer a is not correct in this circumstance, because in severe malaria there is no time to wait for test results.

Point to emphasize:

- This is an opportunity to emphasize to the provider the importance of rapid referral.

Further discussion about differential diagnosis

- Based on what we've just discussed, what is differential diagnosis?
- When should differential diagnosis be used?
- If differential diagnosis is not happening now, what are the barriers that you face?
- Why is counseling and patient understanding of illness important in differential diagnosis? (Many fevers are non-life-threatening and so don't need abx or am, but the mother needs to understand why/when to return.)
- What should you tell the mother about when to return for follow-up?

See the chart below from page 23 of the WHO/United Nations Children's Fund (UNICEF) booklet *Integrated Management of Childhood Diseases*.

WHEN TO RETURN

Advise the Mother When to Return to Health Worker

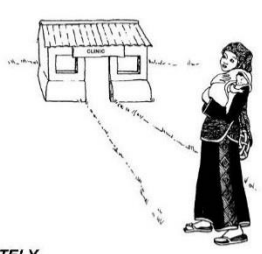
FOLLOW-UP VISIT

Advise the mother to come for follow-up at the earliest time listed for the child's problems.

If the child has:	Return for first follow-up in:
• PNEUMONIA • DYSENTERY • MALARIA, if fever persists • FEVER-MALARIA UNLIKELY, if fever persists • MEASLES WITH EYE OR MOUTH COMPLICATIONS	2 days
• PERSISTENT DIARRHOEA • ACUTE EAR INFECTION • CHRONIC EAR INFECTION • FEEDING PROBLEM • COUGH OR COLD, if not improving	5 days
• ANAEMIA	14 days
• VERY LOW WEIGHT FOR AGE	30 days

NEXT WELL CHILD VISIT

Advise mother when to return for next immunization according to immunization schedule.



WHEN TO RETURN IMMEDIATELY

Advise mother to return immediately if the child has any of these signs:

Any sick child	• Not able to drink or breastfeed • Becomes sicker • Develops a fever
If child has COUGH OR COLD, also return if:	• Fast breathing • Difficult breathing
If child has Diarrhoea, also return if:	• Blood in stool • Drinking poorly



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