ps Kenya

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Fever Case Management Provider Training Manual

A partnership among:

FIND | Johns Hopkins Bloomberg School of Public Health | malaria consortium disease control, better health | psi | World Health Organization | UNITAID

Overview of the provider training manual

Aim: This is a learner's manual for malaria diagnosis and treatment addressed to health care workers who work in private outlets enrolled in the UNITAID Private Sector RDT project. This manual is intended to be used during training on national guidelines for malaria diagnosis and treatment. The manual includes different activities which focus on increasing providers' knowledge, skills and change of attitude towards effective management of malaria. Detailed information can be found in the National Guideline for Malaria Diagnosis and Treatment, 2010.

Audience: Private providers as physicians, pharmacists and drug sellers whose outlets are enrolled in the UNITAID Private Sector RDT project.

Contents:
- Diagnosis and treatment of uncomplicated malaria
- Parasitological diagnosis
- Basic techniques in managing malaria commodities
- Monitoring & Evaluation

Acronyms

ACTs	Artemisinin-based Combination Therapies
AL	Arthemeter -Lumefantrine
CU5	Children under five
FCM	Fever Case Management
ICM	Integrated Case Management
IPT	Intermittent Preventive Treatment
IRS	Indoor Residual Spraying
LLINs	Long-Lasting Insecticide-treated Nets
NMCP	National Malaria Control Program
PfPR	*Plasmodium falciparum* Prevalence Rate
RDTs	Rapid Diagnostic Tests
WHO	World Health Organization

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Learning Unit 1: Diagnosis and treatment of uncomplicated malaria

By the end of this session participants should be able to:

- Describe current epidemiology of malaria in Kenya,
- Describe malaria control interventions in line with current epidemiological map,
- Describe diagnosis and treatment of malaria.

Epidemiology of Malaria in Kenya

Malaria is a disease caused by the parasite plasmodium and it is transmitted by the bite of an infected female anopheles mosquito. Clinical features vary from mild to severe depending on:

- Infecting species of the parasite,
- Patient state of immunity e.g. HIV,
- Acquired malaria Immunity
- Intensity of the infection,
- Presence of other co-morbidities, e.g. malnutrition, anaemia, etc.

Common species of malaria parasite:

Malaria is caused by four plasmodium species, which are *Plasmodium falciparum*, *P. vivax, P. malariae* and *P. ovale*. P. falciparum which causes the severest form of the disease, accounts for 98% of all malaria infections.

Factors contributing to transmission of malaria:

The transmission of the diseases is influenced by a number of factors:

- Distribution of the mosquito vector species (vector density)
- Vectorial capacity of the mosquito vector species,
- Man-Biting Habit of the vector
- Temperature and humidity,
- Rainfall and Altitude
- Hydrology and water supply systems
- Human immunity against malaria parasites,

Malaria disease burden

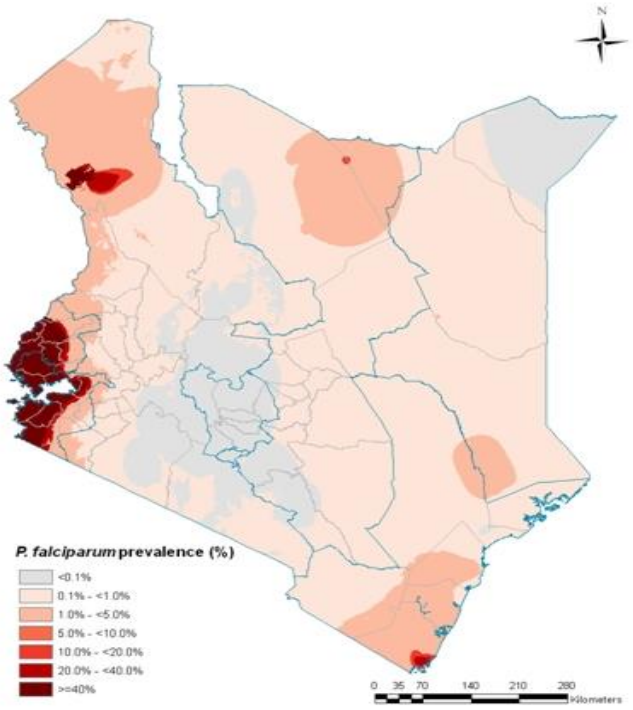
- Children under 5 years and pregnant women are at greater risk of malaria,
- 15-19% of hospital admission in Kenya are due to malaria with 3-5% in patient deaths (HIS 2007),
- Malaria accounts for > 20% outpatient attendance in Kenya. Each family spends Ksh 1,400 or more annually for treating malaria,
- 170 million working days are lost each year.

Kenya has four malaria epidemiological zones with diversity in malaria risk determined by altitude, rainfall patterns and temperature.

- Endemic zones: are areas of stable malaria transmission around Lake Victoria in Western Kenya and along the coast. Transmission is intense throughout the year, with annual percentages of entomological inoculation rates ranging from <10% to 100%. The parasite prevalence rate is estimated at 4.8 PfPR and 38% PfPR for the Coastal and Lake endemic regions respectively.
- Seasonal malaria zones: include semi- arid areas in northern, eastern and south eastern parts of the country that experience short periods of intense malaria transmission during the rainfall seasons which may result in epidemics. The parasite prevalence rate is normally less than 1% PfPR in this zone.
- Highland epidemic zones: are areas of seasonal malaria transmission in the western highlands of the Rift Valley. Malaria epidemics, which occur when climatic conditions favor vector breeding, were common during the early years of the malaria control program in Kenya. The normal parasite prevalence rate now, however, is less than 1% PfPR.
- Low risk zones: cover the central highlands of Kenya, which includes Nairobi where traditionally low seasonal temperatures inhibit sporogony; however, the increasing temperatures and changes in the hydrological cycle associated with climate change are likely to increase the areas suitable for malaria vector breeding, with the introduction of malaria transmission in areas where it had not existed before. Again, the prevalence rate in this zone is generally less than 1% PfPR.

What is the current distribution of malaria in Kenya?

Malaria endemicity map[1]:



Kenya has four malaria epidemiological zones:

[1] Noor AM, *et al.* The risks of malaria infection in Kenya in 2009. *BMC Infectious Diseases* 2009 **9**:180.

Districts	Risk
Lake Victoria and coast region	Endemic: > 20%
Western highlands	Epidemic-prone: 5 to ≤ 20%
Arid and semiarid districts	Seasonal transmission: 0.1 to ≤ 5%
Central highlands including Nairobi	Low risk: < 0.1%

Malaria control interventions

Prevention

- Long lasting insecticide treated nets (LLINs): a household owns one insecticide treated net for every two people living there.
- Indoor residual spraying (IRS): the interior walls of every house are routinely sprayed at appropriate intervals with an effective insecticide.
- Intermittent Preventive Treatment (IPTp): a pregnant woman living in a high transmission setting receives at least 2 doses of an appropriate anti- malaria drug during her pregnancy.

Case management

- Diagnosis: a patient receives prompt parasitological confirmation by microscopy or rapid diagnostic tests (RDTs) for malaria diagnosis.
- Treatment: an infected person receives appropriate anti-malarial drugs for uncomplicated or severe malaria within one day of onset of illness.

Others

- Epidemic Preparedness and Response: establishment of early warning systems and responding appropriately.
- Surveillance: data use to provide progress on malaria control measure.
- Health Education and Behavior Change and Communication: arm the public with the malaria preventive and treatment knowledge.

Epidemiology	Case Management	LLIN	IRS	Health Education/BCC	IPTp	EPR	Surveillance
Lake stable endemic & Coast seasonal stable Endemic	X	X	X	X	X		X
Highland epidemic prone	X	X	X	X		X	X
Seasonal low transmission including arid and Semi arid	X			X		X	X
Low risk	X			X			X

Kenya National Malaria Policy

Not all fevers are caused by malaria, therefore all fever cases should be tested to confirm malaria. The low prevalence of malaria in most parts of the country (as demonstrated by the declining malaria prevalence) has led to changes in policy to advocate for the testing of all suspected malaria cases.

The Kenya national malaria policy recommends accurate parasitological diagnosis of malaria using microscopy or rapid diagnostic tests in all persons with fever and/or other symptoms of malaria and treatment of only parasitological confirmed cases (malaria positive cases).

All age groups:

- All patients with fever or history of fever should be tested for malaria:
    - If the test is positive: treat for malaria,
    - If the test is negative: DO NOT treat for malaria, look for other causes of fever and treat accordingly.
- If parasitological confirmation is not available, patients with fever or history of fever should be assessed further for other causes of fever, managed accordingly or referred.

Consequences of Presumptive Treatment

Not all fevers are malaria hence presumptive treatment of malaria causes:

- Poor prognosis in patients given wrong diagnosis and inappropriate treatment
- Wastage of scarce and expensive ACTs
- Increased risk of ACT resistant parasites
- Increased risk of unnecessary drug reactions
- Erosion of confidence and trust in health services

Algorithm for diagnosis of malaria

Refer to Annex 1 and 2:

- Annex 1: Fever Case Management for private pharmacists and drug sellers,
- Annex 2: Integrated Case Management for private physicians.

Uncomplicated Malaria

Uncomplicated malaria: Malaria without signs of severity or evidence of vital organ dysfunction.

What are the signs and symptoms of uncomplicated malaria?

- Fever
- Chills
- Profuse sweating
- Muscle pains
- Joint pains
- Abdominal pain
- Diarrhea
- Nausea
- Vomiting
- Irritability

- Refusal to feed

Please note that sometimes the symptoms may be non-specific.

Recommended medicines and dosages

Rationale for malaria treatment:

- To provide rapid and long lasting clinical and parasitological cure,
- To reduce malaria related morbidity e.g. anemia,
- To halt the progression of simple disease into severe and potentially fatal disease.

Artemisinin-based Combination Therapies (ACTs) are recommended by WHO to be used for the treatment of uncomplicated malaria. ACTs are combinations in which one of the components is artemisinin or its derivatives (artesunate, artemether or dihydroartemisinin) and the other component is an antimalarial with a known good efficacy profile (e.g. lumefantrine, piperaquine, mefloquine, amodiaquine). The artemisinin compounds are active against all four species of malaria parasites that infect humans and are generally well tolerated.

For the ACTs to eliminate at least 90% of the parasitaemia, a 3-day course of treatment is required. This ensures that only about 10% of the parasitaemia is present for clearance by the partner medicine.

Fixed-dose combinations (the components are mixed in the same tablet) are highly preferable to the loose individual medicines co-blistered or co-dispensed (the components of the combination therapy are in separate tablets). It promotes adherence to treatment and reduces the potential for selective use of the medicines as monotherapy.

First Line Treatment:

- Artemether-Lumefantrine (AL): 6 doses given over 3 days,

Second Line Treatment:

- Dihydroartemisinin-Piperaquine: 3 doses given over 3 days.
- In absence of Dihydroartemisinin-Piperaquine oral quinine should be used.

All other previously used monotherapies including oral artemisinins should not be used for treatment of malaria and are no longer licensed for this purpose anymore. This includes chloroquine, amodiaquine and sulphadoxine-pyrimethamine (SP).

Contraindications:

- Hypersensitivity to either artemether or lumefantrine.
- Not recommended in the first trimester of pregnancy. The recommended treatment for uncomplicated malaria in the first trimester is a 7 day therapy of oral quinine.

Adverse Effects of Artemether-Lumefantrine

While the overall incidence of side effects to AL is low, the common adverse effects reported include sleep disorders, headache, dizziness, nausea, anorexia, abdominal pain, pruritus, rash, cough, palpitation, arthralgia and myalgia. Lumefantrine does not cause prolongation of QT intervals and therefore it is safe in patients with cardiac illness.

Supportive treatment

- Fever Management:
  - Children and Adults: paracetemol,
  - Tepid sponging, exposure, fanning, etc.
- Fluids and Nutrition:
  - Encourage giving extra fluids; continue breastfeeding where applicable.

Dosing schedule for AL

Refer to Annex 3: Treatment of uncomplicated malaria.

Dispensing and Counseling

- Weigh the patient,
- Select appropriate dosage,
- Tell the patient why they are getting the drug,
- Explain dosing schedule:
  - Emphasize the need to complete all doses even if the patient is feeling better,
  - Demonstrate and give instructions for dispersible formulations of AL,
- Give first dose under observation (DOT),
- Observe patient for 30 minutes for vomiting,
- If patient vomits, repeat the dose after 10 minutes.,
- Advise to return IMMEDIATELY if condition worsens,
- Advise to return after 3 days if fever persists,
- Check that the patient or caregiver has understood the instructions before leaving the clinic.

Note: 2nd dose on the 1st day should be given 8 hours after the 1st dose, doses on the 2nd and the 3rd days are twice a day (12 hours apart)

Follow-up care

Suspected Treatment Failure:

- Failure to achieve desired therapeutic response after initiation of therapy,
- May result from non-adherence, vomiting, wrong diagnosis, unusual drug pharmacokinetics, drug resistance, poor quality medicines,
- Should be suspected if there is no improvement 3-14 days after initiation of treatment,
- If symptoms reappear after 14 days treat as a new infection.

Management of Suspected Treatment Failure:

- In cases of non-adherence or non-completion repeat full course of AL after addressing the cause (of non adherence),
- Malaria microscopy should be used to confirm (RDTs not recommended because it remains positive 14-21 days after successful treatment of malaria),
- In facilities with no microscopy patients with suspected treatment failure should be referred,
- Treat confirmed treatment failure cases with Dihydroartemisinin-Piperaquine.

Complicated/Severe Malaria

Severe malaria occurs when infections are complicated by serious organ failures or abnormalities in the patient's blood or metabolism.
Nearly all deaths from severe malaria result from infections with *P. falciparum*. It's important to recognize the danger signs and refer immediately.

Danger Signs in Children:

- Convulsions
- Unconsciousness or altered mental state or lethargic
- Respiratory distress
- Vomiting everything
- Failure to eat or drink
- Extreme weakness or prostration
- Stiff neck/severe headache
- Severe dehydration
- Severe pallor

Danger Signs in Adults:

- Convulsions
- Difficulty in breathing
- Vomiting everything
- Extreme weakness
- Stiff neck or severe headache.

The manifestations of severe malaria include:

- Cerebral malaria, with abnormal behavior, impairment of consciousness, seizures, coma, or other neurologic abnormalities,
- Severe anemia due to hemolysis (destruction of the red blood cells),
- Hemoglobinuria (hemoglobin in the urine) due to hemolysis,
- Acute respiratory distress syndrome (ARDS), an inflammatory reaction in the lungs that inhibits oxygen exchange, which may occur even after the parasite counts have decreased in response to treatment,
- Abnormalities in blood coagulation,
- Low blood pressure caused by cardiovascular collapse,
- Acute kidney failure,
- Hyperparasitemia, where more than 5% of the red blood cells are infected by malaria parasites,
- Metabolic acidosis (excessive acidity in the blood and tissue fluids), often in association with hypoglycemia,
- Hypoglycemia (low blood glucose). Hypoglycemia may also occur in pregnant women with uncomplicated malaria, or after treatment with quinine.

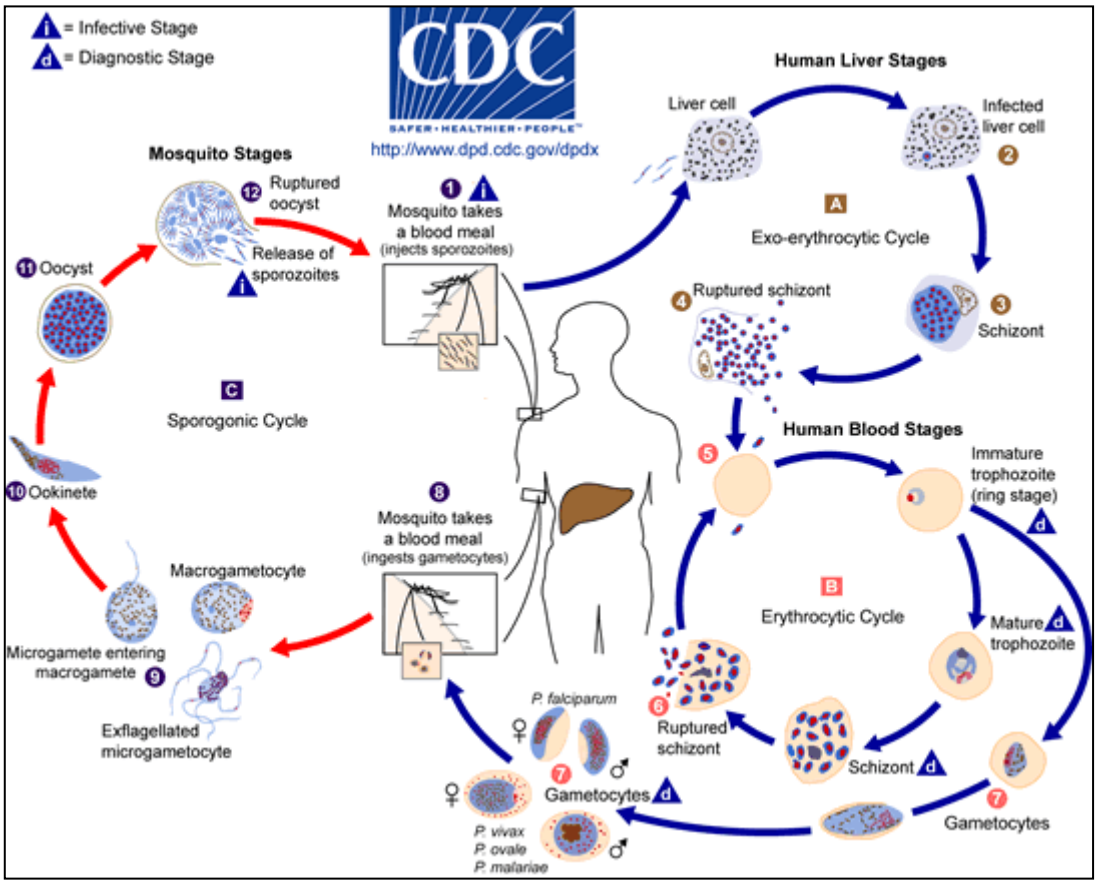
Severe malaria is a medical emergency and should be treated urgently and aggressively.

Learning Unit 2: Parasitological Diagnosis

By the end of this session participants should be able to:

- Explain the rationale of parasitological diagnosis of malaria,
- Describe malaria rapid diagnostic tests (RDTs),
- Perform an RDT, read and interpret results,
- Describe quality assurance system for relating to malaria RDTs,
- Describe safety and waste disposal of contaminated materials.

The life cycle of malaria parasite[2]



Rationale for malaria parasitological diagnosis

- To differentiate malaria cases from other diseases with similar presentations and improve the quality of patient care by confirming parasite-positive patients
- To minimize irrational use of antimalarials and target other fever causing illnesses. This prevents unnecessary use of antimalarials, reducing frequency of adverse effects, especially in those who do not need the medicines, and medicine pressure selection for resistant parasites.

[2] http://www.cdc.gov/malaria/about/biology/

- To monitor response to malaria treatment,
- To confirm/ or predict out breaks,
- Research and surveys,
- Improve malaria disease surveillance by reporting confirmed (true) cases.

Methods of malaria parasitological diagnosis

The two common methods for parasitological confirmation of malaria are microscopy and RDTs. The Kenya national malaria policy recommends parasitological confirmation of all suspected malaria cases with either microscopy or RDT.

Microscopy

While microscopy is the gold standard, it requires skilled manpower, quality assured reagents and equipments. A reliable and well maintained binocular microscope is essential for accurate malaria microscopy. Malaria microscopy is a skilled exercise requiring great care at each step of the standard operating procedures and, precise visual and differential skills.

Advantages of microscopy:

- It is cost effective,
- Can be used to quantify malaria parasites,
- Can be used for all malaria parasites,
- Can be used to monitor treatment of malaria,
- Can give information on other blood parasites and blood picture.

Disadvantages of microscopy:

- Requires more time,
- Can only be performed by qualified laboratory personnel,
- Is a complex procedure requiring high degree of competency and quality management system,
- Requires reliable electrical supply.

Malaria Rapid Diagnostic Tests (mRDTs)

Malaria RDTs are qualitative techniques which specifically detect antigens (proteins) produced by malaria parasite. The tests can be done by minimally trained personnel, and are rapid as results can be obtained within 20 minutes.

- Malaria RDT is an immunochromatographic test based on an antigen antibody reaction,
- May be in form of cassette, dipstick or even a card,
- The test contains a strip with antibodies against malaria parasites/antigens,
- The tests are specific to HRP2, pLDH and aldolase parasite antigens,
- If malaria parasite antigens are present two bands are formed: a control band and a positive band. In the absence of malaria parasite antigens, only the control band is formed.
- There are two main groups of commercially available RDTs:
    - Specific antigen: RDTs detect one species of human malaria parasites.
    - Pan specific antigen: RDTs detect all human species of malaria parasites.

RDT Quality

The RDTs procured for use in Kenya are of high quality with excellent performance characteristics. They are selected, procured, shipped to Kenya and distributed for use in Kenya after fulfilling the following conditions:

- In country requirements for registration of RDTs,
- WHO RDT product testing,
- Pre-shipment Lot testing,
- Post shipment Lot testing,
- In country sensitivity and specificity testing.

Advantages of RDTs

- RDTs are diagnostic tools that can diagnose malaria using finger prick blood.
- RDT pick antigens rather than parasites hence can detect malaria in patients with low parasitaemia.
- They are accurate and easy to use.
- They do not need specialized buildings, electricity or equipment (microscopy laboratory).
- They give results within a short time, usually around 20 minutes.

Limitations of RDTs

- Not quantitative i.e. cannot be used to calculate parasite density.
- Remain positive for 14 to 21 days after successful treatment - HRP2 clears slowly and the test may be positive because of a previous infection and not a current infection (within 14 days).
- Some RDTs are only specific to a certain species of malaria.

When to use RDTs

- Health workers with limited training in laboratory skills or settings with limited resources for supervision.
- Health care workers in the community and health posts with no laboratories.
- Settings with high work load per health worker e.g. outpatient departments of hospitals or health centers in areas of high endemicity.
- Areas with no electricity or high degree of interruption of power supply.
- Areas with poor microscopy training programs and with no quality management system functioning.

Materials required to perform RDTs

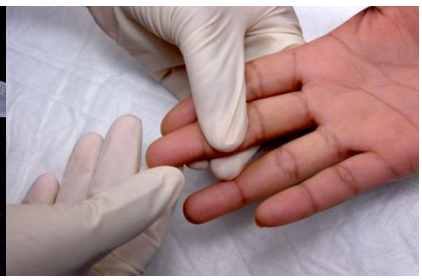
- RDT kit (test cassette, buffer, blood collecting device),
- Sterile lancet,
- Alcohol swab,
- Pencil or pen for labeling,
- Gloves,
- Sharps container,
- Waste disposal container,
- Timer or clock,
- Instruction manual for the specific RDT,
- Dry cotton wool.

Preparing to perform the test

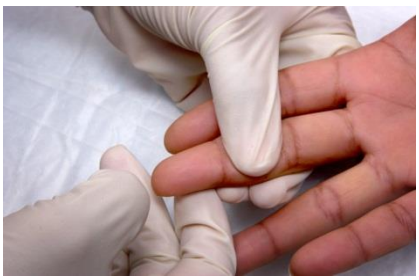
1. Gather the necessary materials in the testing area,
2. Check the expiry date at the back of the test package. If the test kit has expired use another test,
3. Ensure the RDT packaging is not damaged by squeezing gently and feel/listen for air leakage. Note: if the foil packaging is damaged, use another test kit,
4. Explain to the patient what the test is for and procedure,
5. Open the package tearing along the nick and look for the following
    a) colour of desiccant (to be consistent with what indicated by the manufacturer),
    b) cassette,
    c) dropper,
6. Remove the cassette from the foil packaging and label it with patient particulars and reading time,
7. Wear a new pair of gloves,
8. Disinfect the puncture site (4th finger of the non-dominant hand) with an alcohol swab or appropriate disinfectant. The 4th finger is preferred because it's the less used and will cause least inconvenience even if it becomes sore.

Best practices for finger prick:

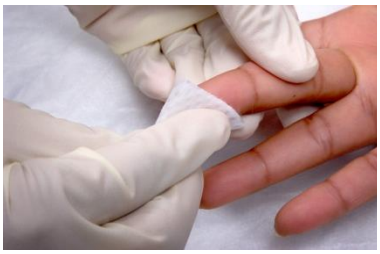
1. Collect supplies.



2. Position non-dominant hand palm-side up. Take the 4th finger.

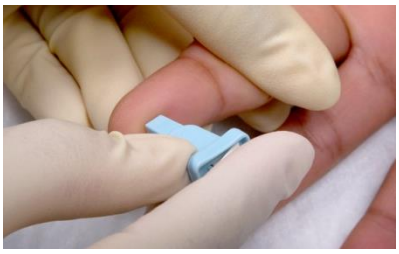


3. Apply intermittent pressure to the finger to help the blood to flow.

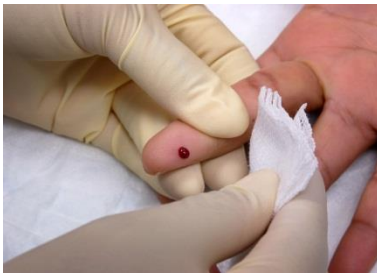


4. Clean the fingertip with alcohol. Start in the middle and work outward to prevent contaminating the area. Allow the area to dry.

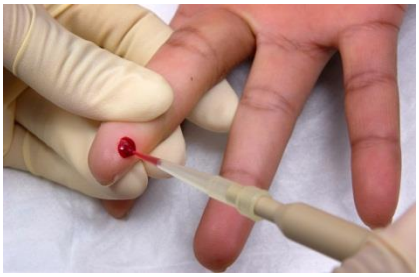
5. Hold the finger and firmly place a new sterile lancet off-center on the fingertip.



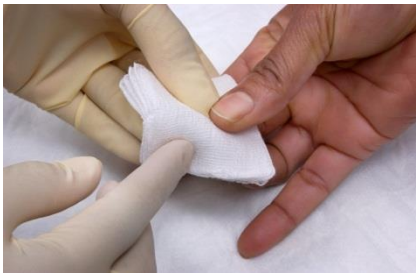
6. Firmly press the lancet to puncture the fingertip.



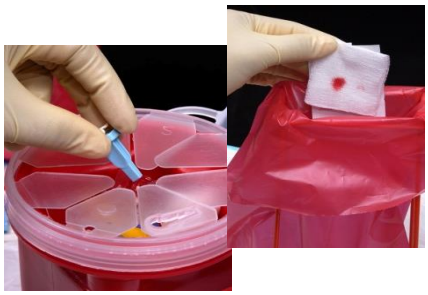
7. Wipe away the first drop of blood with a sterile gauze pad or cotton ball.



8. Collect the specimen. Blood may flow best if the finger is held lower than the elbow.



9. Apply a gauze pad or cotton ball to the puncture site until the bleeding stops.



10. Dispose of waste

RDTs procedure

1. Make a gentle prick towards the pulp (ball) of the 4th finger with a sterile lancet at the disinfected site. Pricking at the tip or midline is more painful. Discard the used lancet in an appropriate sharps container immediately after use. By applying gentle pressure to the finger express the first drop of blood and wipe it away with a dry piece of cotton wool. Make sure no strands of cotton remain on the finger to contaminate blood. Apply gentle pressure to the finger until a new blood drop appears. Emphasize the need for the right skills to ensure correct test performance and accurate results. The reason for wiping out the first drop is because it contains too much tissue fluid which might dilute the antigens and it might be contaminated with the alcohol used for wiping the finger.
2. Using the blood collection device (pipette or capillary tube) provided in the RDT kit, gently immerse the open end in the blood drop. Collect the required volume of blood as per manufacturer's instructions. Good blood collection and adequate amount of blood are fundamental to ensure good results. After pricking and collecting blood, apply a dry cotton wool at the puncture site to stop the bleeding.
3. Transfer the collected blood to the sample well (as indicated on the RDT cassette by the manufacturer). It's important to put the sample in the right well as indicated by the manufacturer. Different manufacturers may have different labeling for the different wells.
4. Holding the buffer bottle vertically, add the recommended number of drops of buffer into the buffer well. Put the exact amount of buffer as indicated by the manufacturer at the correct well of the test device and don't use any other buffer apart from the one provided and specified. Some test kits will come with a bottle of buffer for many tests and others will have enough buffer packed for a single test.
5. Time the test as recommended by the manufacturer. View the result window of the cassette for colour band(s).
    - **Negative** – The presence of only a control band, at the C mark, indicates a negative result for *P. falciparum* malaria. If RDT result is negative, alternative causes of fever should be investigated and treated appropriately. Note: Do not read the results before or after the set time. Don't treat any fever as malaria despite a negative result.
    - **Positive** – The presence of both a control band at the C mark and a test band at the T mark indicates a positive result for *P. falciparum* malaria.
    - **Invalid** — If the test does not show the control band at the C mark, even if there is test band at the T mark, the test is invalid. Perform another RDT.

    Refer to the "RDT Provider job-aid" for pictures of negative, positive and invalid results.
6. Report the results as "RDT Negative" or "RDT Positive" or "RDT Invalid" (in which case the RDT should be repeated). If the RDT is performed in the clinic, outpatient department or in the wards, the result, even if it is negative, should be reported on the appropriate patient card/form. As well as in the OPD register, malaria commodity daily activity register and any other register. The malaria commodity daily activity register contains information for both ACT and RDT.

Quality Assurance and Sources of Common Errors

- Read the manufacturer's instructions prior to performing the test,
- Follow the test procedure, precautions and interpretation of results for this test,
- Check expiry date of the test kit before use,
- Use the correct amount of blood and buffer: incorrect amount of buffer and blood may lead to inaccurate results,
- Read the test at the recommended time,
- Perform and read the test under adequate lighting,
- Only open the foil packaging and remove the RDT immediately before performing the test. If preparation is delayed after opening the packaging, the RDT may be damaged by humidity and results may not be accurate,
- Use only the buffer supplied with the kit; don't use buffer from different lots of RDTs or from different rapid tests,
- Label correctly the patient details on the test cassette to avoid mix ups,
- Record the patient results appropriately,
- Proper storage conditions as per manufacturer's instructions.

Biohazard, Safety and Waste Management

- Protect yourself and others:
    - Wear a laboratory coat,
    - Wear a new pair of gloves,
    - Wash hands,
    - Disinfect working bench: the recommended disinfectant could be 10% hypochlorite.
- Segregate waste material as follows:
    - Sharps: collect in puncture-proof container or sharps container,
    - Bio-hazardous waste: collect in hazardous waste bags (red bag),
    - Non-pathological waste: pour in sink, latrine, or waste pit (black bag).
- All bio-hazardous waste should be incinerated. Outlets with no incinerators should send this waste to larger facilities for incineration.

Learning Unit 3: Basic Techniques in Managing Malaria Commodities

By the end of this session participants should be able to:

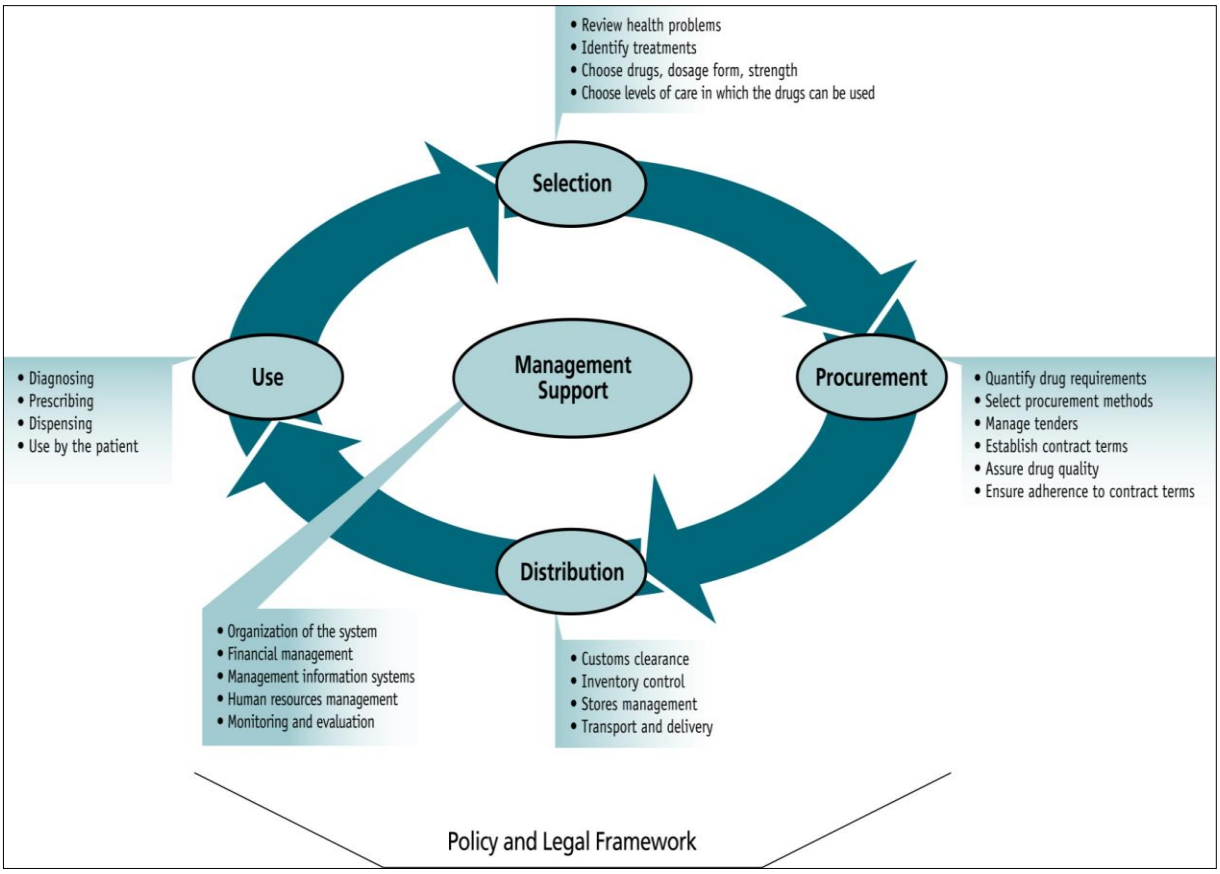
- Describe the basic concepts of malaria commodity management especially for RDTs and malarial medicines,
- Use commodity management tools to ensure accountability of all commodities in the facility,
- Adequately report on malaria commodities consumption.

Definition of Commodity Management

Commodity management is ensuring that the right product of the right quality in right quantities is delivered at right time at right place to the right customer.
Commodity management has to do with:

- Availability,
- Timeliness,
- Safety,
- Effectiveness,
- Quality,
- Rational use of medicines and commodities.

Commodity Management Cycle



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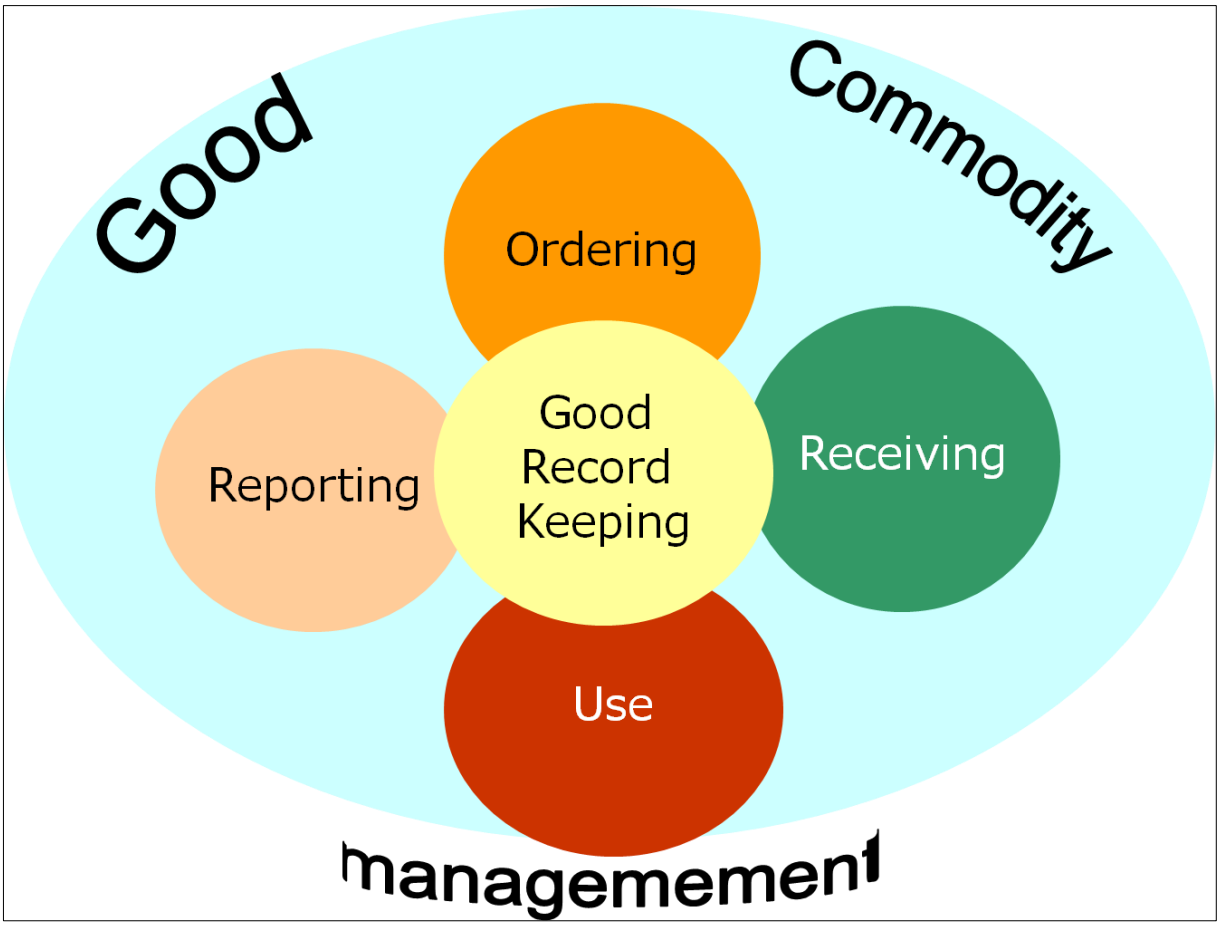


How to receive:

- Record any discrepancy or other problem (e.g. wrong item, wrong quantity, damaged item, etc.) on the **EMMS Discrepancy Report Form** (file duplicate copy for health facility records and send original to KEMSA),
- Essentially you are not supposed to accept damaged, deteriorated, expired, excess or otherwise unwanted/unordered items,
- Always enter the received commodities in the BIN Card.

Storage

Good arrangement:

- Keep commodities off the floor, in cartons facing up. This allows easy cleaning and minimizes damage by water.

Good stock rotation:

- Not all commodities have expiry dates. For those that do, the FEFO principle applies.
- For those where all commodities have same expiry dates or the commodities do not have expiry dates, the FIFO principle applies.

Stocking Conditions:

- Store Commodities at manufacturer's recommended conditions (e.g 4-30°C for RDTs),
- Have air conditioner if possible,

- Should have the max-min thermometers,
- Always follow the manufacturers instructions when storing commodities,
- Avoid extreme temperatures: they damage products (>40°C or for some products < 0°C),
- Monitor the temperature regularly at the hottest time of the day (keep thermometers in various zones).

Assured Security, Restricted Access:

- Access to storage areas should be restricted for security reasons,
- All staff who handle supplies should be accountable for their actions,
- One or two trustworthy people should be responsible for keeping the keys, and one should be available on the premises at all times,
- The person in charge of the health facility is ultimately held responsible,
- All storeroom windows should have burglar proofing, and doors must be fitted with security locks,
- Work areas such as the pharmacy or dispensary should have double locks on the doors.

Use

- During dispensing of ACTs and RDTs, all health workers must ensure they record the usage in the provided Daily activity Register for malaria commodities,
- All dispensing procedures should be followed including Direct Observed Therapy (DOT) for the first dose.

Good record keeping

Records to track stock levels and transactions:

- Inventory records,

Other records:

- Temperature record to monitor temperature.

Level of Use	Inventory Record	Information
Receiving and storing commodities	Delivery Notes Bin cards/stock ledger	Confirmation of delivery and receipt of commodities
Issuing	Bin cards S11/S12	Issues to dispensing area or other facilities
Dispensing	Daily activity registers AL register Tally sheets	Amount of commodities actually dispensed to patients
Reporting & Ordering	SORF Health facility monthly summaries	The consumption/dispensed to user data. Stock balances at end of each reporting period

Learning Unit 4: Monitoring & Evaluation

By the end of this session participants should be able to:

- Describe the importance of Monitoring and Evaluation in malaria case management,
- Demonstrate the use of various data collection tools in malaria case management,
- Describe the importance of quality data,
- Describe the key elements in supportive supervision.

Definitions

- **Monitoring:** the continuous review of the degree to which program activities (i.e. program inputs, output and processes) are completed and targets are met
- **Evaluation**: periodic assessment of change in targeted results (i.e. outcome or impact) that can be attributed to an intervention.

Importance of M&E in Malaria Case Management

- Accurate quantification
- Accountability
- Research.

Indicators, Source and Frequency of collection and use in Malaria

	Indicator	Source	Frequency	Use
1	% of clients under 5 years seeking fever treatment through registered private sector outlets	Client register	Monthly	Monitor fever cases footprint into the private sector
2	% of clients under 5 years seeking fever treatment through registered private sector outlets that received an RDT test	Client register / lab register	Monthly	Encourage testing for all malaria suspected cases.
3	% of clients 5 years and above seeking fever treatment through registered private sector outlets that received an RDT test	Client register / lab register	Monthly	Encourage testing for all malaria suspected cases.
4	% of clients under 5 years seeking fever treatment through registered private sector testing positive for Malaria treated with an effective antimalarial.	Lab register AL Register	Monthly	Comparison of confirmed cases against medicine consumption
5	% of clients 5 years and above seeking fever treatment through registered private sector testing positive for Malaria treated with an effective antimalarial	Lab register AL Register	Monthly	Comparison of confirmed cases against medicine consumption
6	Number of tested cases that are negative.	Client register		
7	Percentage of tested cases that are negative managed appropriately	Client register	Monthly	ICM

Sources of data to measure the indicators:
Possible data sources include:

- Various facility registers,
- Health facility monthly summary,
- Laboratory registers,
- Supervision reports,
- Surveys,
- Delivery notes for AL and RDTs,
- AL/RDTs registers.

Reporting tools for malaria case management:
Summary reports:

- Facility monthly summary for malaria medicines, with AL/RDT component
- District monthly summary report for malaria medicines, with AL/RDT component.

RDT implementation key indicators:

- Percentage of facilities with malaria testing capacity,
- Percentage of facilities that have received supervision on malaria (including RDTs) for the last three months,
- Percentage of invalid RDTs.
- Percentage of RDT negative patients treated with ACT.

Data Quality

- The characteristics of good quality data are:
  - Accuracy: only factual information should be reported,
  - Timeliness: reports should be submitted within defined deadlines (submit summary report to the district headquarters by the 5th of every month),
  - Completeness: all sections of the report should be filled,

Emphasis that data should be analyzed and used at source:

- Reliability and consistency,
- Timeliness of service, courtesy,
- Accuracy and convenience,
- Completeness.

Supportive Supervision

Definition

Supportive supervision is the process of assessing that personnel have the correct knowledge, attitude and skills required to carry out their responsibilities effectively and providing immediate on-the-job training as needed. Supervision refers to the process of assessing the performance and impact of health providers in specific aspects in malaria case management by the technical expert.

Who should be supervised?

- All health facilities should be supervised with special focus on:
  - facilities with inaccurate or incomplete reports,
  - Quality of care assessment,
  - non reporting facilities,
  - facilities which are under stocked or overstocked.

Supervision process

- At district level, a desk review of health facility monthly summary reports,
- Planning for field visits and informing the health facility in advance,
- Standardized checklists provided in the supervision manual should be used,
- Supervision report should be compiled and sent to the next level.
- Supervision report should be shared with the health facility too and discussions on areas of improvement held.
- Joint Supportive supervision: in this UNITAID project, quarterly joint supportive supervision on a sample of outlets should be conducted by involving the MoH County teams (County Malaria focal person and County Laboratory QAO's). This is to provide added objective supervision and encourage teamwork and collaboration with the MoH staff.

Annexes

Annex 1: Fever Case Management algorithm (private pharmacists and drug sellers)
Annex 2: Integrated Case Management algorithm (private physicians)
Annex 3: Treatment of uncomplicated malaria

ANNEX 1

Fever Case Management
(Pharmacies and Drug Outlets)

Fever
History of fever in the last 48 hours or axillary temperature ≥ 37.5°C

Assess patient for:

1. Signs of Severe Malaria or
2. Danger Signs* or
3. Infant less than 2 months or women in the 1st trimester of pregnancy

IF YES →

Refer urgently

Very Severe Febrile Disease
- Give first dose of artesunate or quinine for severe malaria,
- Give first dose of an appropriate antibiotic,
- Give one dose of paracetamol (38.5° C or above).

IF NO ↓

Perform Malaria RDT

IF TEST NEGATIVE →

Non-Malarial Febrile Illness

1. REFER to investigate other causes of fever.

IF TEST POSITIVE ↓

Uncomplicated Malaria

1. TREAT with ACTs,
2. Refer to investigate other causes of disease,
3. Instruct patient to come back immediately if condition worsen or in 2 days if no improvement.

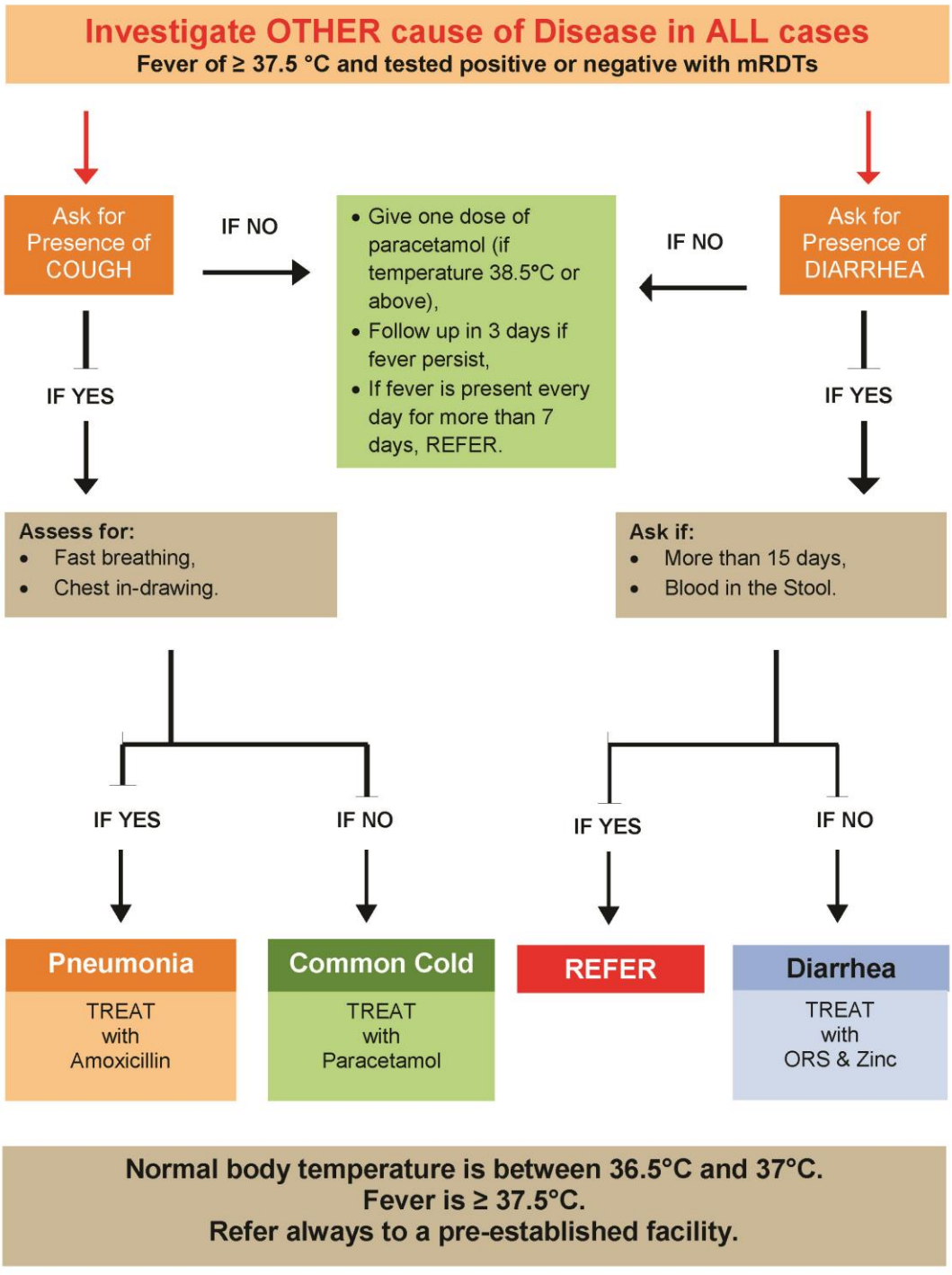
*** Danger Signs in Children**

Ask:
- Is the child able to drink or breastfeed?
- Does the child vomit everything?
- Has the child had convulsions?

Look:
- See if the child is very sleepy /no able to awake.
- Is the child convulsing now?

ANNEX 2

Intergrated Case Management
(Primary Health Care Facilities)



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Intergrated Case Management
(Primary Health Care Facilities)

Treatment of Pneumonia

Recommended Medicine

Amoxicillin dispersible tablets (250mg)

Dosing Schedule

- Weigh the patient,
- Select appropriate dosage.

2 months up to 12 months (weight: 4 to ≤ 10 Kg)

DAY	Hours	
	0 HRS	12 HRS
ONE	1	1
TWO	1	1
THREE	1	1
FOUR	1	1
FIVE	1	1

12 months up to 5 years (weight: 10 to ≤ 19 Kg)

DAY	Hours	
	0 HRS	12 HRS
ONE	2	2
TWO	2	2
THREE	2	2
FOUR	2	2
FIVE	2	2

Note: if only available amoxicillin tablets of 125mg then double the number of tablets.

Dispensing and Counseling:

- ✓ Tell the patient why (s)he is getting the drug,
- ✓ Explain dosing schedule,
- ✓ Emphasize need to complete all doses even if the patient is feeling better,
- ✓ Demonstrate and give instructions for dispersible formulations of amoxicillin,
- ✓ Give first dose under observation (Direct Observation Therapy),
- ✓ Advise to return IMMEDIATELY if condition worsens,
- ✓ Advise to return after 2 days if fever persists,
- ✓ Check whether the patient or caregiver has understood the instructions before leaving the clinic.

Fever Management:

- Children and Adults: paracetamol,
- Tepid sponging, exposure, fanning, etc.

Fluids and Nutrition:

- Encourage giving extra fluids,
- Continue breastfeeding where applicable.

ANNEX 3

Fever Case Management

Treatment of Uncomplicated Malaria

First Line Treatment

Artemether Lumefantrine (AL)
6 doses given over 3 days

Dosing Schedule

- Weigh the patient,
- Select appropriate dosage.

Weight: 5 to ≤ 15 Kg

DAY	Hours		
	0 HRS	8 HRS	12 HRS
ONE	1	1	
TWO	1		1
THREE	1		1

Weight: 15 to ≤ 25 Kg

DAY	Hours		
	0 HRS	8 HRS	12 HRS
ONE	2	2	
TWO	2		2
THREE	2		2

Weight: 25 to ≤ 35 Kg

DAY	Hours		
	0 HRS	8 HRS	12 HRS
ONE	3	3	
TWO	3		3
THREE	3		3

Weight: > 35 Kg

DAY	Hours		
	0 HRS	8 HRS	12 HRS
ONE	4	4	
TWO	4		4
THREE	4		4

Note:

- 2nd dose on the 1st day should be given 8 hours after the 1st dose,
- Doses on the 2nd and the 3rd days are twice a day (12 hours apart)

