The MalariaCare Toolkit

Tools for maintaining high-quality malaria case management services

Checklist for assessing malaria microscopy skills

This checklist was developed by the MalariaCare project for use in project countries. It can be adapted for use in specific national settings.

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

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MalariaCare checklist for assessing malaria microscopy skills

Introduction

Checklists are used during Outreach Training and Supportive Supervision (OTSS) visits by supervisors to guide them in their role as mentors. Checklists help supervisors to focus on key steps in diagnosis, treatment, and overall management of patients with malaria. The checklists also serve as tools for collection of performance monitoring and facility readiness data to help stakeholders make decisions and effectively target resources.

The five MalariaCare checklists focus on:

- Assessing health facility readiness (including register review).
- Assessing clinical management of patients suspected of having malaria.
- Assessing management of severe malaria.
- Assessing malaria microscopy skills.
- Assessing rapid diagnostic test use.

All five checklists and more information about OTSS can be found in the Toolkit section of the MalariaCare website (www.malariacare.org/resources/toolkit).

Contents

A. Health facility information

Name of Health Facility	
Province/Region	
District	
Name of Head of Laboratory	
Signature of Head of Laboratory	
Phone Number of Head of Laboratory	
Date of Visit (DD/MM/YYYY)	
Supervisor's Name	
Supervisor's Signature:	
Supervisor's Phone Number:	

B. Human resources: Laboratory staff

- **Note the number of full-time or part-time employees. Record "0" if staff is never present.**
- **At health-facility level, include all laboratory staff.**
- **At district-hospital level and above, include only workers in the laboratory who are being assessed.**

	Total employed
Laboratory Tech	
Laboratory Assistant	
Student/Intern	
Other medical staff	
Total staff in the laboratory today	

C. Training overview: Laboratory

Are there any laboratory staff who have been formally trained in RDTs in the last two years? ☐Yes ☐No

Are there any laboratory staff who have been formally trained in microscopy in the last two years? ☐Yes ☐No

If "Yes" to either question above, fill in Section D. If "No", go to Section E.

D. Training detail: Laboratory

- **Note the number of full-time or part-time employees.**
- **At health-facility level, include all health care workers.**
- **At district-hospital level and above, include only workers in the OPD who are being assessed.**

	Total trained
Clinical staff above trained on RDTs in the last two years	
Name of organization that conducted RDT training	_____
Clinical staff above formally trained in malaria microscopy in the last two years	
Name of organization that conducted microscopy training	_____

E. Stockouts for malaria microscopy

Was there a stockout of any of the following for seven consecutive days in the last three months?

Lancets/needles and syringes	☐Yes	☐No
Methylated spirits	☐Yes	☐No
Glycerol	☐Yes	☐No
Giemsa stain and/or field stain	☐Yes	☐No
Buffer solution/tabs	☐Yes	☐No
Microscope slides	☐Yes	☐No
Immersion oil	☐Yes	☐No
pH paper/meter	☐Yes	☐No

Has this lab experienced a power outage during the last three months that limited the ability to perform malaria microscopy? ☐Yes ☐No

F. Microscopes, spare parts, and maintenance

Is there at least one functional microscope at the health facility? ☐Yes ☐No

If "Yes," number of functional microscopes at the facility

Number of nonfunctional microscopes at the health facility

Are there standard microscope repair kits? ☐Yes ☐No

If "Yes," how many?

Are there spare bulbs in stock? ☐Yes ☐No

Are there fuses in stock? ☐Yes ☐No

Does the laboratory staff conduct routine cleaning/maintenance of the microscope(s)? ☐Yes ☐No

Are maintenance engineers or contractors available to complete microscope repair, OR is someone in the facility trained in microscope repair? ☐Yes ☐No

G. Minor laboratory equipment

- **Tick the box that best describes items found in the laboratory.**

	Present & functional	Present, nonfunctional	Not present
Lab Coats/Aprons	☐	☐	☐
Hemoglobin Meter	☐	☐	☐
Glucometer	☐	☐	☐
Urine Strips	☐	☐	☐
Staining Racks	☐	☐	☐
Staining Vessels	☐	☐	☐
Glass Staining Dishes	☐	☐	☐
Slide Drying Racks	☐	☐	☐
Serological Pipets and Pipet Bulbs or Automated Pippetor	☐	☐	☐
Timers	☐	☐	☐
Tally Counters	☐	☐	☐
Slide Storage Boxes	☐	☐	☐
Graduated Cylinder (50 mL)	☐	☐	☐
Graduated Cylinder (250 mL)	☐	☐	☐
Graduated Cylinder (500 mL)	☐	☐	☐
Weighing Scale	☐	☐	☐
Funnel	☐	☐	☐
Blood Tube Roller/Mixer	☐	☐	☐

H. Internal quality assurance

Does this facility have a microscopy IQA program? (A facility must provide at least two negative slides and two weak positive slides for rechecking to be considered to have an IQA program.)	☐Yes	☐No
Are positive control slides available for testing new batches of stain?	☐Yes	☐No
Are standards used to calibrate the pH meter?	☐Yes	☐No
Are stained slides cross-checked by another laboratory staff member?	☐Yes	☐No
Are results from IQA exercises recorded in a dedicated IQA register?	☐Yes	☐No
Are slides stored for rereading?	☐Yes	☐No
Are slides stored in slide boxes?	☐Yes	☐No
Is malaria species identification routinely performed?	☐Yes	☐No
Is parasite counting performed?	☐Yes	☐No

If "Yes", which method of counting is performed?
☐ Plus System ☐ Parasites/µL ☐ % RBC infected with malaria parasites

I. External quality assurance

Does the laboratory participate in a malaria EQA scheme outside of OTSS?	☐Yes	☐No

J. Use of malaria diagnostic tests and turnaround time for test results

Are laboratory registers to record malaria microscopy results available in this facility?	☐Yes	☐No
Is turnaround time for slide preparation and reading documented in the register?	☐Yes	☐No

If "Yes", what is the average turnaround time for the last week? _____ minutes

K. Laboratory malaria reference material

- **Only tick "Yes" if you can verify that these materials are physically available:**

Most recent version of MOH guidelines for microscopy	☐Yes	☐No
SOP: Microscopy	☐Yes	☐No
Bench aid: Microscopy	☐Yes	☐No
SOP: Use of RDTs in the lab	☐Yes	☐No
Bench aid: Use of RDTs in the lab	☐Yes	☐No

L. Malaria microscopy EQA/IQA (slide rechecking)

- **Randomly select ten slides to recheck.**
  The supervisor should recheck the slides first and record findings below; then the laboratory staff person being assessed should recheck the slides.

Slide #	Supervisor			Lab Staff		
		Parasites/µL	Species		Parasites/µL	Species
1	☐ Pos ☐ Neg ☐ Unknown/ No Test Result			☐ Pos ☐ Neg ☐ Unknown/ No Test Result		
2	☐ Pos ☐ Neg ☐ Unknown/ No Test Result			☐ Pos ☐ Neg ☐ Unknown/ No Test Result		
3	☐ Pos ☐ Neg ☐ Unknown/ No Test Result			☐ Pos ☐ Neg ☐ Unknown/ No Test Result		
4	☐ Pos ☐ Neg ☐ Unknown/ No Test Result			☐ Pos ☐ Neg ☐ Unknown/ No Test Result		
5	☐ Pos ☐ Neg ☐ Unknown/ No Test Result			☐ Pos ☐ Neg ☐ Unknown/ No Test Result		
6	☐ Pos ☐ Neg ☐ Unknown/ No Test Result			☐ Pos ☐ Neg ☐ Unknown/ No Test Result		
7	☐ Pos ☐ Neg ☐ Unknown/ No Test Result			☐ Pos ☐ Neg ☐ Unknown/ No Test Result		
8	☐ Pos ☐ Neg ☐ Unknown/ No Test Result			☐ Pos ☐ Neg ☐ Unknown/ No Test Result		
9	☐ Pos ☐ Neg ☐ Unknown/ No Test Result			☐ Pos ☐ Neg ☐ Unknown/ No Test Result		
10	☐ Pos ☐ Neg ☐ Unknown/ No Test Result			☐ Pos ☐ Neg ☐ Unknown/ No Test Result		

M. Instructions for using the checklists

Laboratory supervisors should use the checklists in the following pages to observe three laboratory staff preparing, staining, and reading malaria slides.

- **Wherever possible, observe a different laboratory staff person for each observation.** If the facility has fewer than three laboratory staff, supervisors may observe one of the staff more than once.

- **Wait until after the observation is complete to provide mentoring.** If you are observing a laboratory staff person more than once, wait until after all observations have been done to provide mentoring. This will ensure that the staff's behavior during the second observation is not influenced by your inputs.

- You should only intervene during the observation if whatever the laboratory staff person is doing puts the patient in critical danger and/or serious harm.

- If the patient receives incorrect treatment or referral, but is not in critical danger, wait until the end of the observation. Ask the patient to wait for a few moments outside. Then, in a collegial way, address the incorrect practices with the laboratory staff person. Work with the staff to find the patient and ensure that he or she receives correct treatment/referral prior to departure from the clinic.

- If you are unable to conduct any of the three observations please record the reason why you are unable to conduct the observation.

N. Preparing thick and thin blood films

Type of provider	Observation 1	Observation 2	Observation 3
1. Lab Tech **2. Lab Assistant** **3. Other (specify)**	☐ Other:	☐ Other:	☐ Other:
Has this worker received OTSS mentorship before?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
If "Yes," how many times? (Leave blank if not mentored)	_____	_____	_____
Patient/slide preparation	**Observation 1**	**Observation 2**	**Observation 3**
Patient identified and ID information recorded in register?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Gloves worn?	☐ Yes ☐ No ☐ Not available	☐ Yes ☐ No	☐ Yes ☐ No ☐ Not available
Slide cleaned?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Slide labeled with date and patient's name and/or number?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Specimen collection: Finger prick	**Observation 1**	**Observation 2**	**Observation 3**
Was collection via finger prick?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
If "Yes," proceed with this section. If "No," skip to next section "Specimen Collection: Venipuncture."			
Finger cleaned with alcohol and allowed to dry?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Finger pricked, first drop of blood wiped off, and next drop placed on slide without touching finger?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Specimen collection: Venipuncture	**Observation 1**	**Observation 2**	**Observation 3**
Was collection via venipuncture?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
If "Yes," proceed with this section. If "No," skip to next section "Spreading Thick Films."			
Labeled EDTA collection tube with date and patient's name and/or number?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Puncture site cleaned with alcohol and allowed to dry?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Sterile needle and syringe or vacutainer assembled?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Venous blood sample successfully collected and gently mixed?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Spreading thick films	**Observation 1**	**Observation 2**	**Observation 3**
Blood from only one patient applied to each slide?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Blood sample spread into 1- to 2-cm diameter circle; can read print placed under the slide? (Supervisor should verify to answer this question)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Slide air-dried before staining?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Spreading thin films **(If this lab does not do thin films, mark "N/A" in this section)**	**Observation 1**	**Observation 2**	**Observation 3**
Blood from only one patient applied to each slide?	☐ Yes ☐ No ☐N/A	☐ Yes ☐ No ☐N/A	☐ Yes ☐ No ☐N/A
Thin film spread out in feathered pattern (thins out toward end, dispersed and dome-shaped in appearance)?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Slide air-dried before staining?	☐ Yes ☐ No ☐ N/A	☐Yes ☐No ☐ N/A	☐Yes ☐ No ☐ N/A
Feedback	**Observation 1**	**Observation 2**	**Observation 3**
Supervisor: Did you provide feedback to lab staff on issues identified during observation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Reason if unable to conduct/complete microscopy preparation observation	**Observation 1**	**Observation 2**	**Observation 3**
If "No," why not? **Write the reason number in the box for each observation** 1. Lack supplies/equipment 2. Lack of power 3. No malaria microscopy tests ordered 4. No lab staff who conduct malaria microscopy 5. Stopped due to potential patient harm 6. Not enough time during facility visit 7. Other (specify)	☐ Other:	☐ Other:	☐ Other:

O. Staining thick and thin blood films

Type of provider	Observation 1	Observation 2	Observation 3
		☐ Same worker from Obs 1 ☐ A new worker	☐ Same worker from Obs 1 ☐ Same worker from Obs 2 ☐ A new worker
1. Lab Tech 2. Lab Assistant 3. Other (specify)	☐ Other:	☐ Other:	☐ Other:
Has this worker received OTSS mentorship before?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
If "Yes", how many times? (Leave blank if not mentored)			

Stain technique	Observation 1	Observation 2	Observation 3
Did laboratory staff use a Giemsa stain?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Did laboratory staff use a field stain?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

- **If Giemsa stain, proceed to next section titled "Steps for staining thick and thin blood films (Giemsa stain)."**
- **If field stain, skip to section titled "Steps for staining thick and thin blood films (field stain)" below.**

Steps for staining thick and thin blood films (Giemsa stain)

Preparation of Giemsa staining solutions	Observation 1	Observation 2	Observation 3
Is a standard 10% Giemsa solution used?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Was the preparation of fresh Giemsa staining solution done properly or prepared the day of observation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Supervisor: Were you able to check pH with pH paper or a pH meter?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
If "Yes", was pH of the staining solution between 7.2 and 7.4?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Stain filtered prior to use?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Staining thick films	Observation 1	Observation 2	Observation 3
Slide immersed in 10% Giemsa stain for 10–15 minutes?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Slide rinsed carefully with water (caution with thick smears since not fixed)?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Staining thin films (If not done in this laboratory, mark "N/A" in this section)	**Observation 1**	**Observation 2**	**Observation 3**
Slide fixed with absolute methanol (2–3 seconds) and allowed to air dry?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Slide immersed in 10% Giemsa stain for 10–15 minutes?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Slide rinsed carefully with water?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Steps for staining thick and thin blood films (field stain)			
Preparation of field stain solutions	**Observation 1**	**Observation 2**	**Observation 3**
Preparation of fresh Field stain A (methylene blue) done properly or prepared on day of observation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Preparation of fresh Field stain B (eosin) done properly or prepared on day of observation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Stain filtered prior to use?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Staining thick films	**Observation 1**	**Observation 2**	**Observation 3**
Slide immersed in Field stain A for 3 seconds?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Slide rinsed carefully with water (caution with thick smears since not fixed)?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Slide immersed in Field stain B for 5 seconds?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Slide rinsed carefully with water?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Staining thin films (If not done in this laboratory, mark "N/A" in this section)			
Slide fixed with absolute methanol (2–3 seconds) and allowed to air-dry?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Slide immersed in Field stain A for 3 seconds?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Slide rinsed carefully with water?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Slide immersed in Field stain B for 5 seconds?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Slide rinsed carefully with water?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
Drying	**Observation 1**	**Observation 2**	**Observation 3**
Slide drained and air-dried (avoid applying external heat)?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Waste management	**Observation 1**	**Observation 2**	**Observation 3**
Sharps waste segregated and safely disposed in a safety box?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Infectious waste disposed of in appropriate waste containers?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Liquid waste appropriately washed off/disinfected?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Feedback	**Observation 1**	**Observation 2**	**Observation 3**
Supervisor: Did you provide feedback to lab staff on issues identified during observation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
If no, why not? **Write the reason number in the box for each observation:** 1. Lack of supplies/equipment 2. Lack of power 3. No malaria microscopy tests ordered 4. No lab staff who conduct malaria microscopy 5. Stopped due to potential patient harm 6. Not enough time during facility visit 7. Other (explain)	☐ Other:	☐ Other:	☐ Other:

P. Reading thick and thin blood films

Type of provider	Observation 1	Observation 2	Observation 3
		☐ Same worker from Obs 1 ☐ A new worker	☐ Same worker from Obs 1 ☐ Same worker from Obs 2 ☐ A new worker
1. Lab Tech 2. Lab Assistant 3. Other (specify)	☐ Other:	☐ Other:	☐ Other:
Has this worker received OTSS mentorship before?	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A	☐ Yes ☐ No ☐ N/A
If "Yes", how many times? (Leave blank if not mentored)			
What type of slide was prepared?	☐ Thick smear ☐ Thin smear ☐ Both	☐ Thick smear ☐ Thin smear ☐ Both	☐ Thick smear ☐ Thin smear ☐ Both
Reading slides	**Observation 1**	**Observation 2**	**Observation 3**
Thick smear: Reported slide as positive or negative for parasites?	☐ Pos ☐ Neg ☐ Unknown/ No test result	☐ Pos ☐ Neg ☐ Unknown/ No test result	☐ Pos ☐ Neg ☐ Unknown/ No test result
Supervisor: Do you agree with this assessment?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Thick or thin smear: Was quantification performed?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
If "Yes," how was quantification supported? 1. Plus System 2. Parasites/µL 3. % of RBC infected with malaria parasites	☐	☐	☐
Report quantification	_____	_____	_____
Supervisor: Do you agree with this assessment?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Thin smear: Was speciation performed?	☐ Yes ☐ No ☐ N/A (thick smear only)	☐ Yes ☐ No ☐ N/A (thick smear only)	☐ Yes ☐ No ☐ N/A (thick smear only)
Species of parasitesfound: 1. *Plasmodium falciparum* 2. *P. malariae* 3. *P. ovale* 4. *P. vivax* 5. Mixed	☐	☐	☐

Supervisor: Do you agree with this assessment?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Was the quality of stain adequate? (Adequate=did NOT require filtering due to heavy precipitate and was NOT too pink or too blue due to inappropriate pH)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Slides recycled?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Feedback	**Observation 1**	**Observation 2**	**Observation 3**
Supervisor: Did you provide feedback to lab staff on issues identified during observation?	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
If no, why not? **Write the reason number in the box for each observation:** 1. Lack of supplies/equipment 2. Lack of power 3. No malaria microscopy tests ordered 4. No lab staff who conduct malaria microscopy 5. Stopped due to potential patient harm 6. Not enough time during facility visit 7. Other (explain)	☐ Other:	☐ Other:	☐ Other:

Q. Additional comments on the observations

Observation 1
Observation 2
Observation 3

R. Supervisor feedback and action plan

- **If you found more than one gap during the last facility visit, or if you have identified more than one during the current visit, make a copy of this page for each gap.**
- **Leave a copy of the supervisor feedback and action plan at the health facility.**

Date of facility visit: _____

Number of staff mentored: Male _____ Female _____

1. What were the biggest gap(s) identified during the *last* facility visit?
Briefly describe gap(s):

Briefly describe the action plan laid out in the previous visit:

Were these gaps addressed?
☐Not addressed ☐ Partially addressed ☐ Completely addressed
If addressed, explain action taken. If partially or not addressed, what is the new action plan to address the gap(s)?

2. What were the biggest gap(s) identified today?
Briefly describe gap(s):

Was immediate feedback provided? ☐No ☐ Yes

If yes, how was the feedback provided?
☐Guideline review ☐Demonstration ☐SOP review ☐Lecture
☐Clinical mentoring ☐Other (specify): _____

What is the action plan for assessing whether these gap(s) have been addressed?

3. Supervisor comments

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