

Rapid Assessment of Malaria during Pregnancy

Laboratory Methods

Topics Discussed

- **Blood safety**
- **Finger prick and peripheral blood smear**
- **Hemoglobin assessment using Hemocue**

Blood Safety

- Use gloves
- Dispose of sharps (lancets, blades, broken slides) immediately in a sharps container
- Dispose biohazard waste (sharps, hemocue cuvettes, cotton with blood) in a puncture-resistant bag /container
 - Bag should be incinerated
- Any blood spills should be immediately cleaned up with clean gauze with e.g. 10% bleach or a chlorhexidine solution

Finger Prick and Peripheral Smear

- Know how to perform a finger prick:
 - Avoids unnecessary injury and discomfort
 - Ensures the amount of blood needed
- Know how to prepare a good quality thin and thick blood smear
 - Assists in correctly identifying malaria and diagnosing the species

Needed

- Alcohol preps
- Gloves
- Cotton balls or gauze
- Frosted end glass slide
- Pencil
- Sterile lancets
- Sharps container

Preparations (I)

- Label slide at “Frosted end”: use pencil or label slide with marker pen (non-removable)
- Label with study ID number, date, and eventually venue
 - Make sure that you can identify the participant to give feedback on the result, and treatment
 - Make sure you write legibly.
- Make sure the slide is clean. Only touch the slide from the side.

Preparations (II)

- **Have ready:**
 - **3 cotton balls**
 - **1 for cleaning slide**
 - **1 for wiping away first drop**
 - **1 for stopping bleeding**
 - **1 alcohol prep**
 - **1 slide**
 - **1 sterile lancet**
 - **a sharps container within reach**

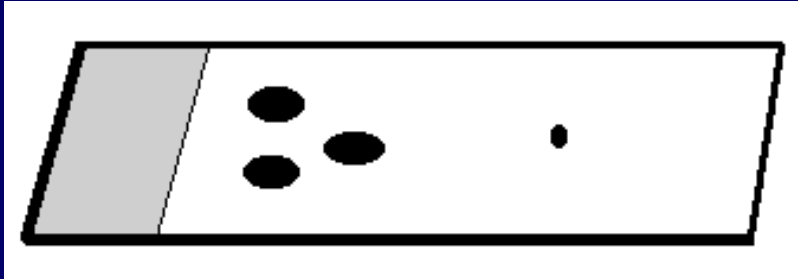
Finger Prick

- Stand next to the participant; ask which finger the client prefers
 - Preference: 4th finger left
- Clean finger with alcohol prep
- Allow at least 10 seconds to dry
- Stick finger on the lateral side of finger tip, not too deep
- Dispose lancet in sharps container
- Wipe first drop away: ensure that blood taken is free of grease, perspiration or dirt

Preparing Smear

- Take the finger and hold the bleeding surface downwards
- Use first drop for hemoglobin assessment
- Use next drops for blood smear:
 - Touch the finger lightly to the slide
 - 2-3 times for the thick smear (10 microliters)
 - Once for the thin film (small drop, 2 microliters)
 - Note: If the finger is bleeding profusely, try to take the drop with the finger upward

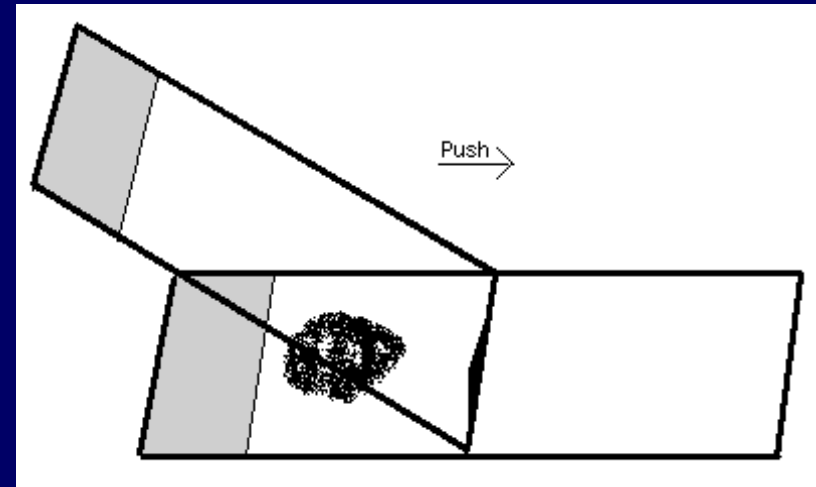
Thick Smear



- With the point of another slide, mix the 2-3 drops together for a thick smear
- Make about 6 spots, end in the middle
- You should be able to read book text through it
- A thick smear is used for examination and counting of parasites

Thin Smear

- Touch the edge of a clean slide at a 45-degree angle just in front of the single drop of blood
- Slowly draw back the clean slide while holding the sample with forefingers of the other hand
- As the blood spreads laterally along the edge of the clean slide, rapidly push clean slide forward, not stopping until clean slide leaves the bloody slide



- A thin smear is used for species identification

Finishing

- Put a cotton ball on the wound and ask the participant to pinch
- Keep the slide upright and flat until dry
- Dry a slide in a slide folder
 - Protects the slides from feeding flies or dust
- Clean the slide used to make the present one and use it for the next participant

Processing and Reading Smears

- If thin smears are used, methanol is needed to fix the thin smear (dry after fixing)
- If immediate result: use 10% Giemsa and stain for 15 minutes
- If result can wait, stain for longer with less concentrated (e.g. 45 minutes, 4% Giemsa, better quality)
- Count per 300 WBC common
- However: assumption of 6000 or 8000 WBC in a microliter are both used
- Negative smears: reading of a minimum of 50 fields

Hemocue

Needed

- Logbook (laboratory log book)
- Quality control book
- Hemocue hemoglobin photometer
- Hemocue control cuvette
- Disposable Hemocue cuvettes

Hemocue Procedures (I)

- Record in logbook:
 - The participant's ID
 - Date of the measurement
 - Person conducting the measurement
- Remove a cuvette from the container, immediately close container
- Use the drop that comes after wiping off the first drop

Hemocue Procedures (II)

- Place the cuvette tip into the middle of the drop
- Allow the blood to be drawn in by capillary action
- Avoid “milking the finger”; only light pressure acceptable



- Fill the cuvette completely

Hemocue Procedures (III)

- Move power switch to power on: “Hb” is on the display
- Pull the cuvette holder to insert position: if blinking “ready,” put cuvette in the holder



- The filled cuvette **MUST** be placed in the photometer within 10 minutes of sampling
- Results will appear in 10-15 seconds

Hemocue Procedures (IV)

- Record the Hb result on the form and in the logbook
- Pull out the holder, remove the cuvette and discard in biohazard container



Daily Quality Control

- Test the calibration control cuvette every day
- Record the result in the quality control logbook
- Values should not deviate from the assigned value by more than 0.3 g/dl
- Clean the cuvette holder every day

Laboratory Log Book

- Back up and quality control

Malaria During Pregnancy Rapid Assessment – Laboratory ANC Logbook Facility:

District/Region: _____

Date	Woman's study number	Blood smear +/-	Species*	Density	Hb**	Comments

*In some settings may need a column for malaria species.

**If Hemocue will not be done in the laboratory, a separate logbook will need to be made.