

## Module 11: Use and Care of Equipment at the HIV Rapid Testing Site

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<b>Purpose</b>	To help participants understand exactly what is expected of them concerning the care and use of equipment at the HIV rapid test site and to equip them with the necessary skills
<b>Pre-requisite Modules</b>	<ul style="list-style-type: none"> <li>Module 5: Assuring the Quality of HIV Rapid Testing</li> </ul>
<b>Module Time</b>	55 minutes
<b>Learning Objectives</b>	<p>At the end of this module, participants will be able to:</p> <ul style="list-style-type: none"> <li>Specify their responsibilities related to equipment at the HIV rapid test site</li> <li>Routinely monitor the temperatures of refrigerators or freezers</li> <li>Confirm auto pipettes deliver specified volumes</li> <li>Properly use and maintain centrifuges</li> </ul>

### Module Overview

Step	Time	Activity/ Method	Content	Resources Needed
1	5 min	Presentation	Module introduction	Slides 1-6 Prepared flipchart – content outline
2	5 min	Presentation Discussion	Responsibilities concerning equipment	Slides 7-8
3	25 min	Presentation Activity Demonstration	Refrigerator & freezer Pipettes Centrifuge	Slides 9-23 Pipettes Centrifuge
4	15 min	Activity	Create a Maintenance Activity List	Slide 24 Flipcharts
5	5 min	Q&A	Summary	Slide 25

#### Material/Equipment Checklists:

- PowerPoint slides or transparencies
- Overhead projector or computer w/LCD projector
- Flipchart for content outline and small-group activity
- Handouts: [Daily Temperature Check Chart](#), [Generic Maintenance Form](#)
- Precision and disposable pipettes – have several sets to pass around
- Centrifuge

## Teaching Guide

Slide Number	Teaching Points
 <p><i>Customization Notes</i></p>	<p>Modify this module based on the equipment your participants will be using at the test sites. For example, consider:</p> <ul style="list-style-type: none"> <li>▪ What type of pipettes will they be using</li> <li>▪ Whether a centrifuge will be available on site</li> </ul>
 <p><i>Customization Notes</i></p>	<p>Also modify this module based on participants' jobs and responsibilities.</p> <ul style="list-style-type: none"> <li>▪ For lab management or supervisors, put emphasis on the oversight responsibilities.</li> <li>▪ For lab technicians or testers, put emphasis on execution and following procedures.</li> </ul>
<b>1</b>	<p><b><u>Module 11: Use and Care of Equipment</u></b></p> <p>DISPLAY this slide before you begin the module. Make sure participants are aware of the transition into a new module.</p>
<b>2</b>	<p><b><u>The Lab Quality System</u></b></p> <p>REMIND participants that equipment is a component of the Lab Quality System. This component addresses:</p> <ul style="list-style-type: none"> <li>• Equipment selection</li> <li>• Equipment acquisition</li> <li>• Equipment installation and initial calibration/validation</li> <li>• Maintenance service and repair</li> <li>• Troubleshooting</li> <li>• Retiring equipment and disposition</li> </ul>
<b>3</b>	<p><b><u>Learning Objectives</u></b></p> <p>STATE the objectives on the slide.</p>
<b>4</b>	<p><b><u>Content Overview</u></b></p> <p>EXPLAIN the topics that will be covered in this module.</p>
<p><b>Flipchart</b></p> 	<p>WRITE the content outline on a flipchart prior to training.</p> <p>REFER to it frequently to orient participants to where they are in the module.</p>

Slide Number	Teaching Points
5	<p><b><u>Functioning Equipment is Vital to Quality Service</u></b></p> <p>EXPLAIN the rationale for properly maintaining equipment.</p> <ul style="list-style-type: none"> <li>• Reliable results aid clinical diagnosis. Unreliable results may result in incorrect diagnosis and treatment of the patient.</li> <li>• If equipment is properly maintained, it is less likely to breakdown before its next service and is less likely to perform inadequately due to lack of maintenance.</li> </ul>
6	<p><b><u>Equipment at HIV Rapid Testing Site</u></b></p> <p>STATE HIV Rapid Testing can be performed with minimal equipment. At a minimum, there are 4 pieces of equipment that may be used at the rapid testing site.</p> <p>EXPLAIN the use of each type of equipment.</p> <ul style="list-style-type: none"> <li>• Refrigerators store reagents, kits, and quality control materials requiring refrigerator storage (such as Capillus).</li> <li>• Freezers store specimens collected for EQA purposes prior to transport to a reference laboratory. Quality control specimens may also be stored in a freezer.</li> <li>• Pipettes collect or transfer specimen to test device.</li> <li>• Centrifuges separate cells from serum/plasma</li> </ul> <p>EMPHASIZE all equipment used at the testing site must be properly maintained. Using equipment that has not been properly maintained may compromise the quality of test results.</p>
7	<p><b><u>Management Responsibilities: Ensure Test Site Readiness</u></b></p> <p>EXPLAIN lab management is responsible for making sure the test site is ready to receive and install a new piece of equipment. This includes:</p> <ul style="list-style-type: none"> <li>• Assigning responsibilities – this includes oversight of all lab equipment and individual responsibilities.</li> <li>• Establishing inventory record – Each piece of equipment must have an inventory record. This record contains pertinent information such as make and model, maintenance and service record, and manufacturer contact information.</li> <li>• Training the operators – Everyone using any piece of laboratory equipment must be properly trained. Training must include troubleshooting.</li> </ul>

Slide Number	Teaching Points
8	<p><b><u>Your Responsibilities: Execute at Test Site</u></b></p> <p>EXPLAIN the responsibilities of the test site staff.</p> <p>DISCUSS the reason against using malfunctioning equipment.</p>
9	<p><b><u>Function Checks Verify that Equipment is Working Properly</u></b></p> <p>EXPLAIN function checks – they are activities performed periodically to ensure that:</p> <ul style="list-style-type: none"> <li>• Equipment is working properly before use</li> <li>• Equipment is properly maintained for peak performance</li> </ul> <p>PROVIDE examples of function checks at the HIV rapid test site.</p>
10	<p><b><u>Refrigerator and Freezer: Use and Care</u></b></p> <p>EXPLAIN the points on the slide.</p>
11	<p><b><u>Refrigerator &amp; Freezer: Temperature Checks</u></b></p> <p>EXPLAIN this photo illustrates routine monitoring of temperatures of this refrigerator.</p> <ul style="list-style-type: none"> <li>• It is good practice to attach the form for recording temps directly on the front of the refrigerator for easy access.</li> <li>• Inserting it into a protector page will guard against tearing of paper.</li> </ul>
12	<p><b><u>Refrigerator &amp; Freezer: Temperature Log</u></b></p> <p>EXPLAIN this form is an example of what should be used to record and monitor refrigerator/freezer temps.</p> <p>REFER participants to a sample temperature log in the participant manual.</p>
13	<p><b><u>Types of Pipettes</u></b></p> <p>EXPLAIN the difference between the two types of pipettes.</p> <p>EMPHASIZE never re-use disposable items. Doing so will cause cross contamination.</p>
<p><b>Activity</b> <b>3 minutes</b></p>	<p>PASS around a few sets of precision and disposable pipettes for everyone to see and touch.</p>

Slide Number	Teaching Points
14	<p><b><u>Pipette: Use and Care</u></b></p> <p>EXPLAIN the points on the slide.</p> <p>EXPAND the first bullet: Select a pipette with delivery range close to the volume required. For example, if 50 micro liters (ul) of specimen is required, use a 100 ul pipette.</p> <p>EMPHASIZE <u>never lay the pipette on its side when liquid is in the tip</u> – doing so will cause the specimen to flow into to the pipette shaft and damage the pipette.</p>
15	<p><b><u>Pipette: Use and Care (Cont'd)</u></b></p> <p>EXPLAIN the points on the slide.</p> <p>EXPAND the third bullet: Air bubbles in the tip can greatly reduce pipetting accuracy. If an air bubble is trapped within the tip during intake, do the following:</p> <ul style="list-style-type: none"> <li>• Dispense the sample into the original vessel</li> <li>• Check the tip immersion depth</li> <li>• Pipette more slowly</li> <li>• If an air bubble appears a second time, discard the tip and use a new one.</li> </ul> <p>EMPHASIZE the following safety practices. (REMIND participants of the safety module)</p> <ul style="list-style-type: none"> <li>• Care should be taken to discard pipette tips in the appropriate container. Used pipette tips should not be found on the floor, as this poses a safety hazard.</li> <li>• Never re-use a pipette tip, which causes cross contamination and will compromise patient results. A fresh tip should be used for each sample.</li> </ul>
 <i>Customization Notes</i> <b>16-17</b>	<p>If precision pipettes are used at test sites, provide hands-on practice.</p>
16	<p><b><u>Precision Pipettes Require Performance Checks</u></b></p> <p>The analytical balance should have a scale of 0.1 to 0.0001 mg</p>
17	<p><b><u>Pipette: Steps for Checking Reproducibility</u></b></p> <p>EMPHASIZE performance checks include reproducibility and calibration.</p> <p>EXPLAIN the procedures for checking reproducibility.</p>

Slide Number	Teaching Points
18	<p><b><u>Pipette: Troubleshooting</u></b></p> <p>EXPLAIN the points on the slide.</p>
 <p><i>Customization Notes</i></p> <p>19</p>	<p>For participants without a lab background, or who have never seen a centrifuge, add the following steps before showing the next few slides:</p> <p>SHOW a centrifuge.</p> <p>DEMONSTRATE how it works.</p> <p>NAME all parts that will be mentioned in the following slides.</p>
19	<p><b><u>Centrifuge: Use and Care</u></b></p> <p>EXPLAIN the bullets on the slide.</p> <ul style="list-style-type: none"> <li>▪ Always operate with the lids closed – Operating a centrifuge without the lid closed poses an unnecessary safety hazard.</li> <li>• Balance contents before turning on. – For example, if there is only one sample to be centrifuged, a tube identical in size and volume must be placed in the rotor opposite the tube. Note: The rotor is the part of the centrifuge that holds the tubes and rotates during operation.</li> <li>• Check for vibration – There may be several reasons why a centrifuge vibrates. When vibration occurs, you'll need to: <ul style="list-style-type: none"> <li>➤ Stop operation of the centrifuge.</li> <li>➤ Determine the cause of the noise or vibration.</li> <li>➤ Correct immediately to prevent severe damage to the centrifuge or injury to the worker. Refer to the owner's manual for possible causes aside from improper balancing</li> </ul> </li> <li>• Do not open until the lid until the rotor has come to a complete stop</li> <li>• Keep lids on tubes when spinning – Do not take the tops off the tubes before spinning. Doing so will cause splashing and creating of aerosols from potentially infectious material</li> </ul>
20	<p><b><u>Centrifuges: Function Checks</u></b></p> <p>EXPLAIN separation activity is a function of both centrifugal force and timing. Proper balance, lubrication and rotor function are essential for proper centrifugation to occur.</p>

Slide Number	Teaching Points
21	<p><b><u>Centrifuge: Routine Maintenance</u></b></p> <p>EXPLAIN how to clean the centrifuge:</p> <ul style="list-style-type: none"> <li>▪ Clean interior daily with soap and water, wipe with a disinfectant</li> <li>▪ Wipe spills using 10% bleach solution</li> <li>▪ After cleaning, run the centrifuge at varying RPMs to check the braking mechanism and ensure a smooth gradual stop</li> </ul> <p>EXPLAIN what to do when noticing unusual noises:</p> <ul style="list-style-type: none"> <li>▪ Stop operation of the centrifuge</li> <li>▪ Follow manufacturer's recommendation on activation and release of brakes</li> <li>▪ Correct immediately to prevent severe damage to the centrifuge or injury to the worker</li> </ul> <p>MENTION brushes need to be inspected every 3-6 months and replaced according to manufacturer specifications.</p>
22	<p><b><u>Centrifuge Safety</u></b></p> <p>STATE the bullets on the slide.</p> <p>STATE simply turning the power off does not remove power to the centrifuge.</p>
23	<p><b><u>Keep a Log for All Maintenance Activities</u></b></p> <p>MENTION the need for documenting problems, corrective action, preventive maintenance, cleaning, and inspections.</p> <p>REFER participants to a sample, generic maintenance log in the participant manual.</p>
<p>24</p> <p><b>Activity</b></p> <p><b>15 minutes</b></p>	<p><b><u>Exercise: Create a Maintenance Activity Log</u></b></p> <p>FOLLOW the procedure below when conducting the activity:</p> <ul style="list-style-type: none"> <li>INFORM participants of the activity.</li> <li>READ the instructions on the slide.</li> <li>PROVIDE a flipchart for each work group.</li> <li>ALLOW 10 minutes for the small group to work.</li> <li>DEBRIEF by asking volunteers to present their lists and solicit comments from other participants.</li> </ul>

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 <p><i>Customization Notes</i></p> <p><b>24</b></p>	<p>Alternative way to conduct this activity:</p> <p>If all the participants come from the same test site, or if you have time constraint, you may modify this activity by facilitating a large group discussion (instead of having small work groups) to create the activity list.</p>
<p><b>25</b></p>	<p><b><u>Summary</u></b></p> <p>ASK participants to answer the questions on the slide.</p> <p>ANSWER any questions participants may have.</p>