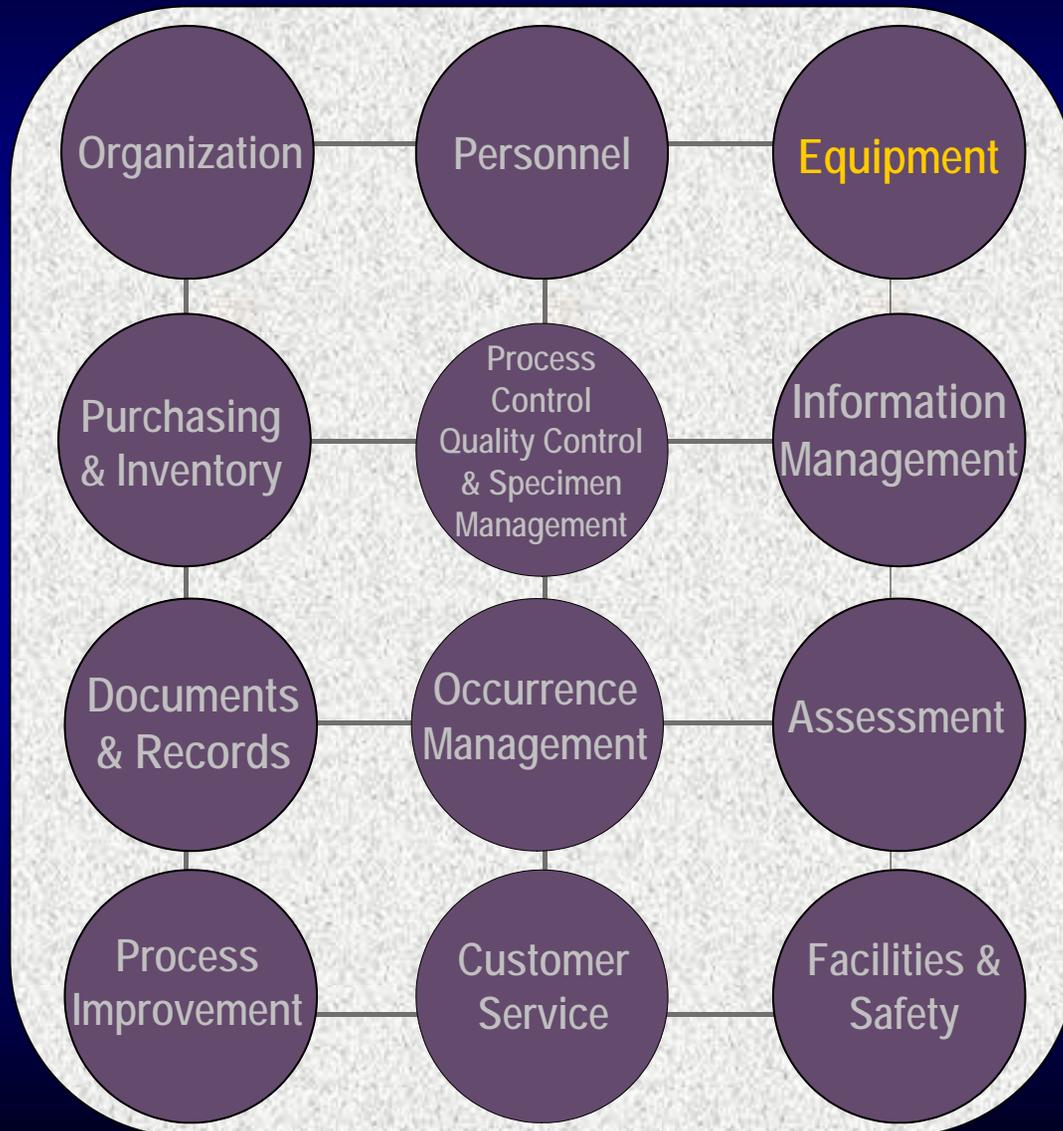


# Module 11: Use and Care of Equipment

At the HIV Rapid Testing Site



# The Lab Quality System



◆ Lab workers

◆ Health workers

◆ Counselors

# Learning Objectives

At the end of this module, you will be able to:

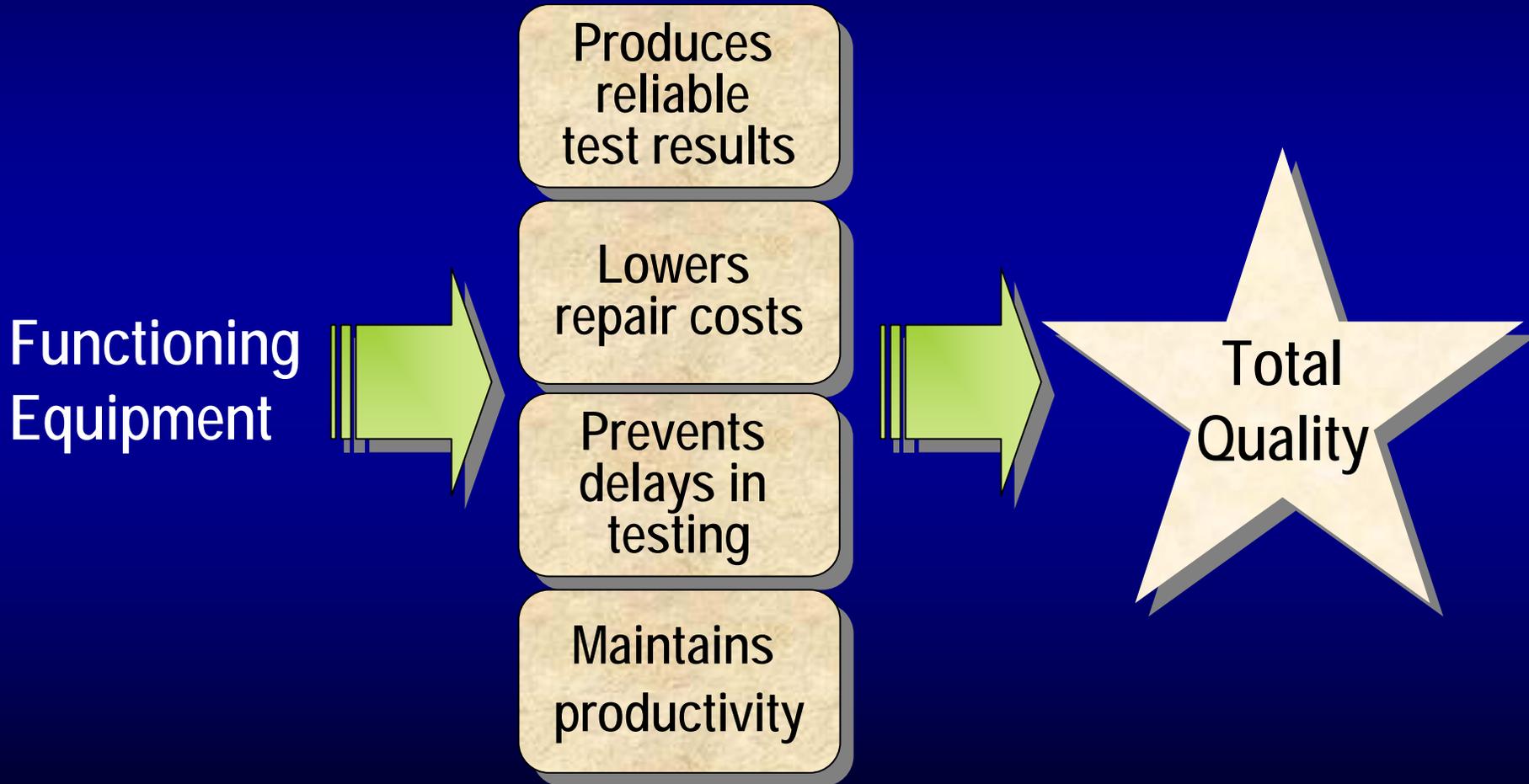
- Specify your responsibilities related to equipment
- Routinely monitor the temperatures of refrigerators and freezers
- Confirm auto pipettes deliver specified volumes
- Properly use and maintain centrifuges



# Content Overview

- Rationale for using properly maintained equipment
- Your responsibilities for equipment
- Use and care of equipment at the HIV rapid testing site
  - Refrigerator and Freezer
  - Pipette
  - Centrifuge

# Functioning Equipment is Vital to Quality Service



# Equipment at HIV Rapid Testing Site

## Refrigerator & freezer



## Pipette

Collects or transfers specimen to test device



## Centrifuge

Separates cells from serum/ plasma



# Management Responsibilities: Ensure Test Site Readiness

Before equipment use:

- Assign oversight responsibility
- Update laboratory equipment inventory record
- Develop and implement written protocols for operating procedures
- Establish maintenance program including routine function checks and trouble-shooting
- Establish maintenance log
- Provide training for all operators



# Your Responsibilities: Execute at Test Site

- Follow written operational procedures
- Conduct routine maintenance, including function checks
- Take corrective actions
- Keep records



Do not use malfunctioning equipment

# Function Checks Verify that Equipment is Working Properly

Performed routinely

- Daily, weekly, monthly
- After adjustment or repair

**Example:**

- Monitoring refrigerator temperatures
- Verifying pipette accuracy
- Checking centrifuge speed

# Refrigerator and Freezer: Use and Care

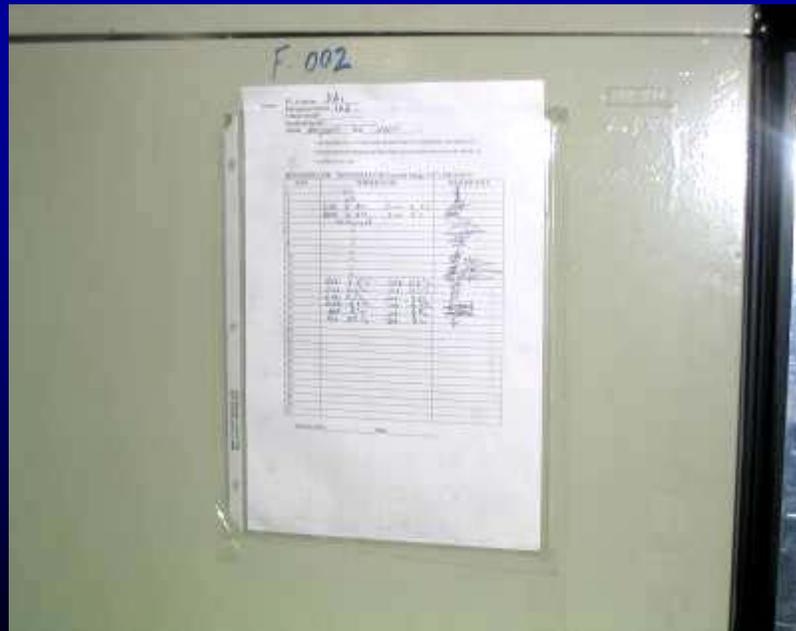
- Keep organized
- Periodically clean inside and outside
- Ensure door is completely sealed when closing
- **CAUTION!** – DO NOT store food items or beverages in laboratory refrigerator or freezer



# Refrigerator & Freezer: Temperature Checks

Monitor daily

- Refrigerator: 2°C to 8°C
- Freezer: -20°C, -40°C, or -80°C



Lab workers



Health workers



Counselors

# Refrigerator & Freezer: Temperature Log

DAILY TEMPERATURE CHECK CHART FOR REFRIGERATOR/FREEZER/INCUBATOR #			
Thermometer #		Temp set:	
Acceptable Range: _____			
Date	Month	Year	Comments
Temp Observed	Initials		
1			
2			
3			
4			
5			
6			
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# Types of Pipettes

- Precision pipettes (Not disposable)
  - Precise and accurate volumes (e.g., 50  $\mu$ l for Determine)
  - Use disposable, single-use, pipette tips



- Graduated plastic bulb pipettes (Disposable)
  - Dispenses approximate volume
  - Easy to use



# Pipette: Use and Care

- Select the appropriate pipette for the volume required
- Ensure that the pipettor, tips, and specimen are at the same temperature
- Firmly attach tip



# Pipette: Use and Care (Cont'd)

- Hold the pipette vertically when aspirating
- Place tip just below the sample
- Avoid air bubbles
- Discard contaminated tips in appropriate container after completion of task



## **DO NOT RE-USE**

- Pipette tips
- Graduated plastic bulb pipettes



# Precision Pipettes Require Performance Checks

- Performed periodically
- Required supplies:
  - Pipette
  - Pipette tips
  - Analytical balance
  - Weigh boats
  - Distilled or deionized water



# Pipette: Steps for Checking Reproducibility

1. Pipette a series of 10 samples into a weigh boat on an analytical scale
2. Record weight of each sample to calculate calibration results
3. Verify calculated results are within limits

<b>Range</b>	<b>Max/Min</b>	<b>Accuracy</b>
10 $\mu$ l	$\pm$ 1.0 $\mu$ l	10%
100 $\mu$ l	$\pm$ 10.0 $\mu$ l	10%
200 $\mu$ l	$\pm$ 20.0 $\mu$ l	10 %

4. If the results are not within limits, remove from service until appropriate adjustment can be made
5. Decontaminate pipette and scale after use



# Pipette: Troubleshooting

Problem	Potential Cause	Action
Leakage	<ul style="list-style-type: none"><li>• Tip(s) incorrectly attached</li><li>• Foreign articles between the tip and cone</li><li>• O-ring damaged</li></ul>	<ul style="list-style-type: none"><li>• Attach firmly</li><li>• Clean tip cones</li><li>• Change the O-ring</li></ul>
Inaccurate dispensing	<ul style="list-style-type: none"><li>• Incorrect operation</li><li>• Tip incorrectly attached</li></ul>	<ul style="list-style-type: none"><li>• Follow manufacturer's instructions carefully</li><li>• Firmly attach tip</li></ul>





# Centrifuge: Use and Care

- Always operate with the lid closed
- Balance contents before turning on
- Check for vibration
- Do not open the lid until the rotor has come to a complete stop
- Keep lids on tubes when spinning



# Centrifuges: Function Checks

- Proper balance
- Lubrication
- Rotor function



# Centrifuge: Routine Maintenance

- Clean interior, condenser coils, fan, and screens
- Investigate unusual noises or vibrations
- Inspect for evidence of wear, cracks in fitting, corrosion, uneven wear, or signs of fatigue:
  - Head, shaft head and coupling
  - Rotor
  - Brushes and bearings
  - Power supply
  - Motor and lubricant
  - Gaskets, seals, mounts and lubricants
- Calibrate speed



# Centrifuge Safety

- Increase the speed slowly until optimal speed is reached
- Disconnect the centrifuge from the electrical source before preventive maintenance, cleaning or inspection
- Take caution when removing spills and broken specimen tubes after a run
- If tubes are broken, keep the door closed and allow to sit undisturbed for 30 minutes before attempting to clean
- Use tweezers to remove broken glass







# Exercise: Create a Maintenance Activity List

Purpose:

- Use what you have learned in this module and create a maintenance checklist specific to your test site

Process:

- Work in groups of 3-4 (or by test site)
- Create a list of maintenance activities on a daily, weekly, monthly, and yearly basis
- **Activity time; 10 minutes**

# Summary

- Why is it important to keep equipment in optimal condition?
- Describe proper use and care for:
  - Refrigerator and freezer
  - Pipettes
  - Centrifuges
- What are some routine maintenance activities performed on:
  - Refrigerator and freezer?
  - Pipettes?
  - Centrifuges?
- Describe your responsibilities for equipment at the test site.