

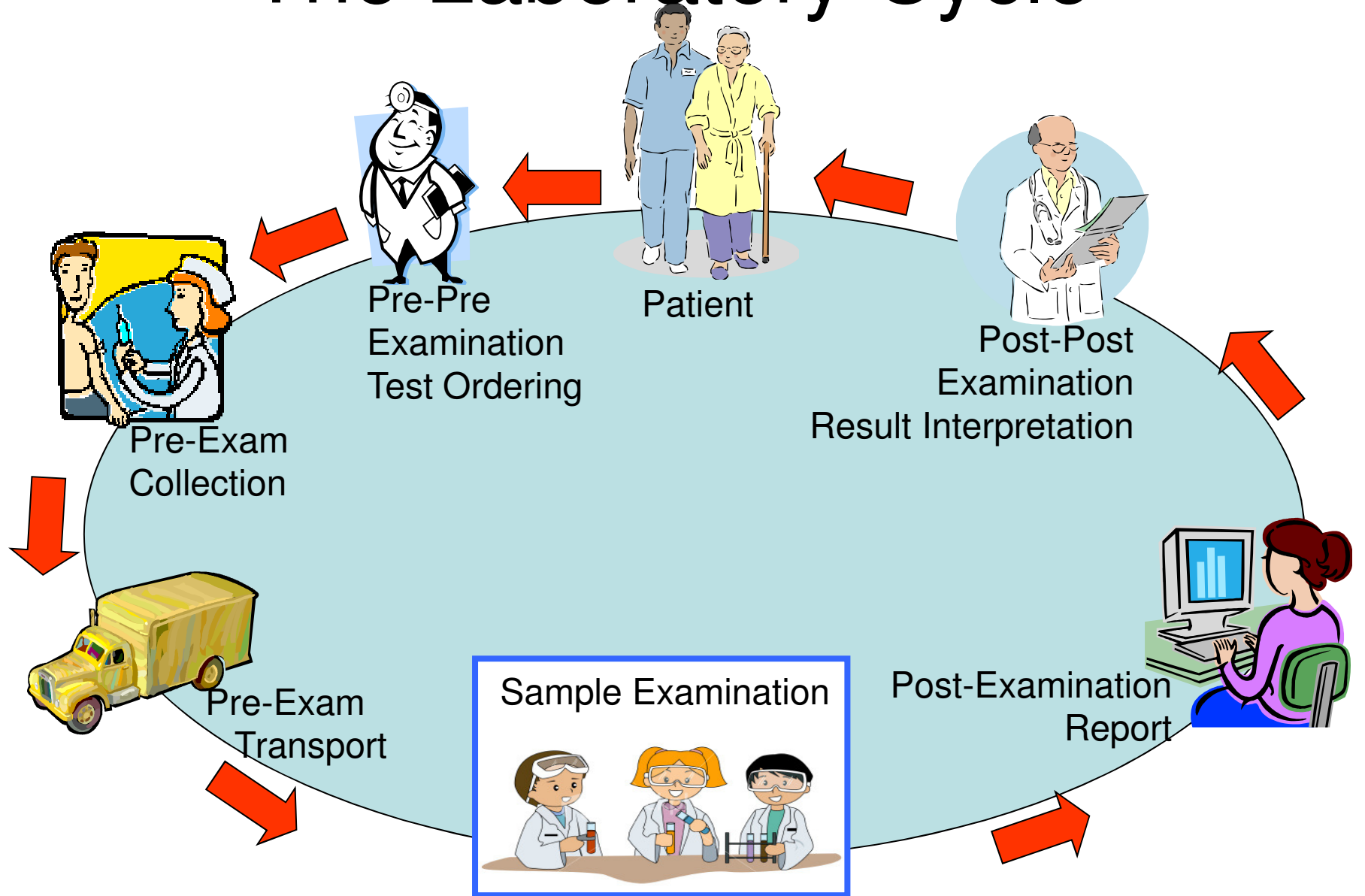
Setting up Samples for Microbiology

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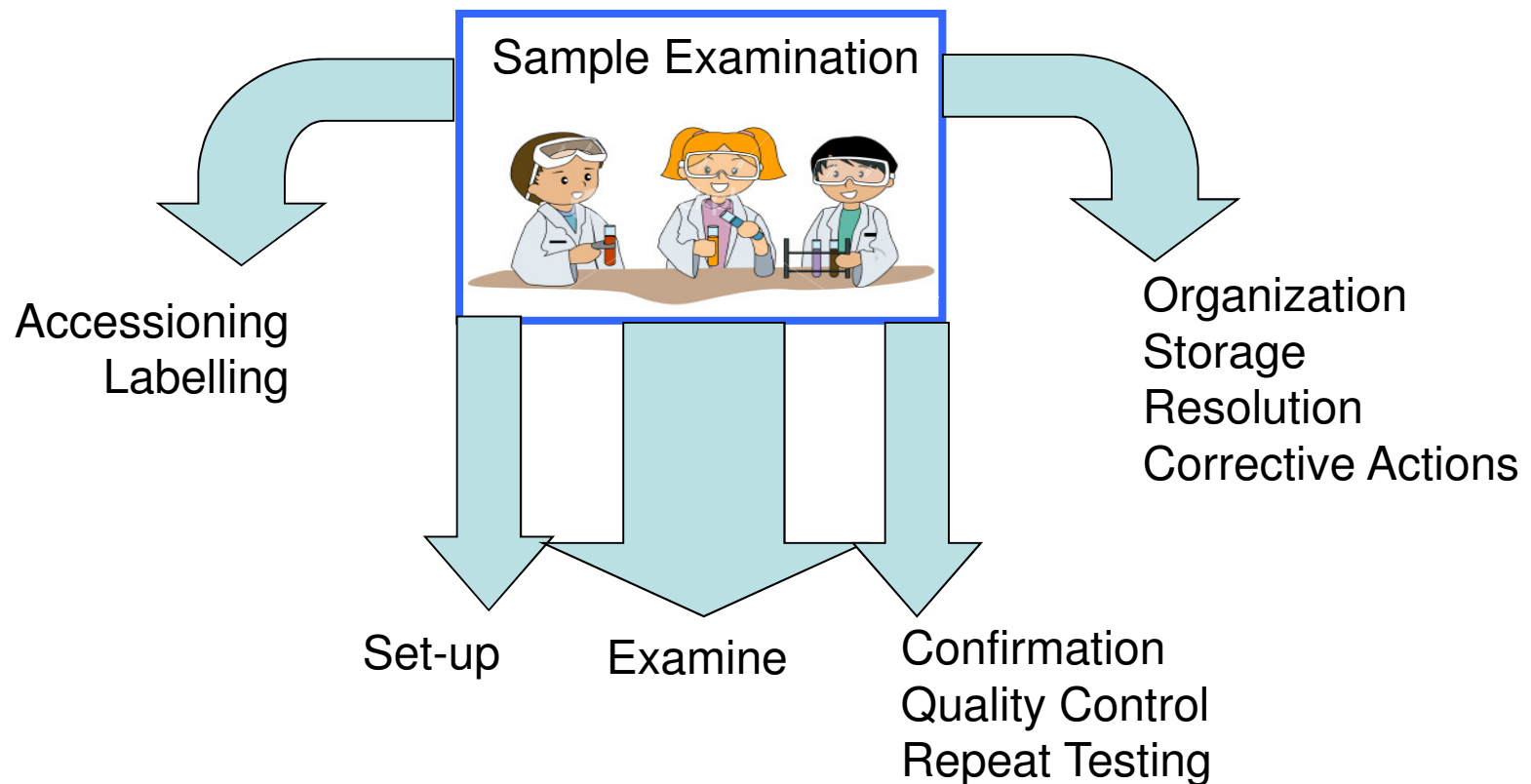
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The Laboratory Cycle



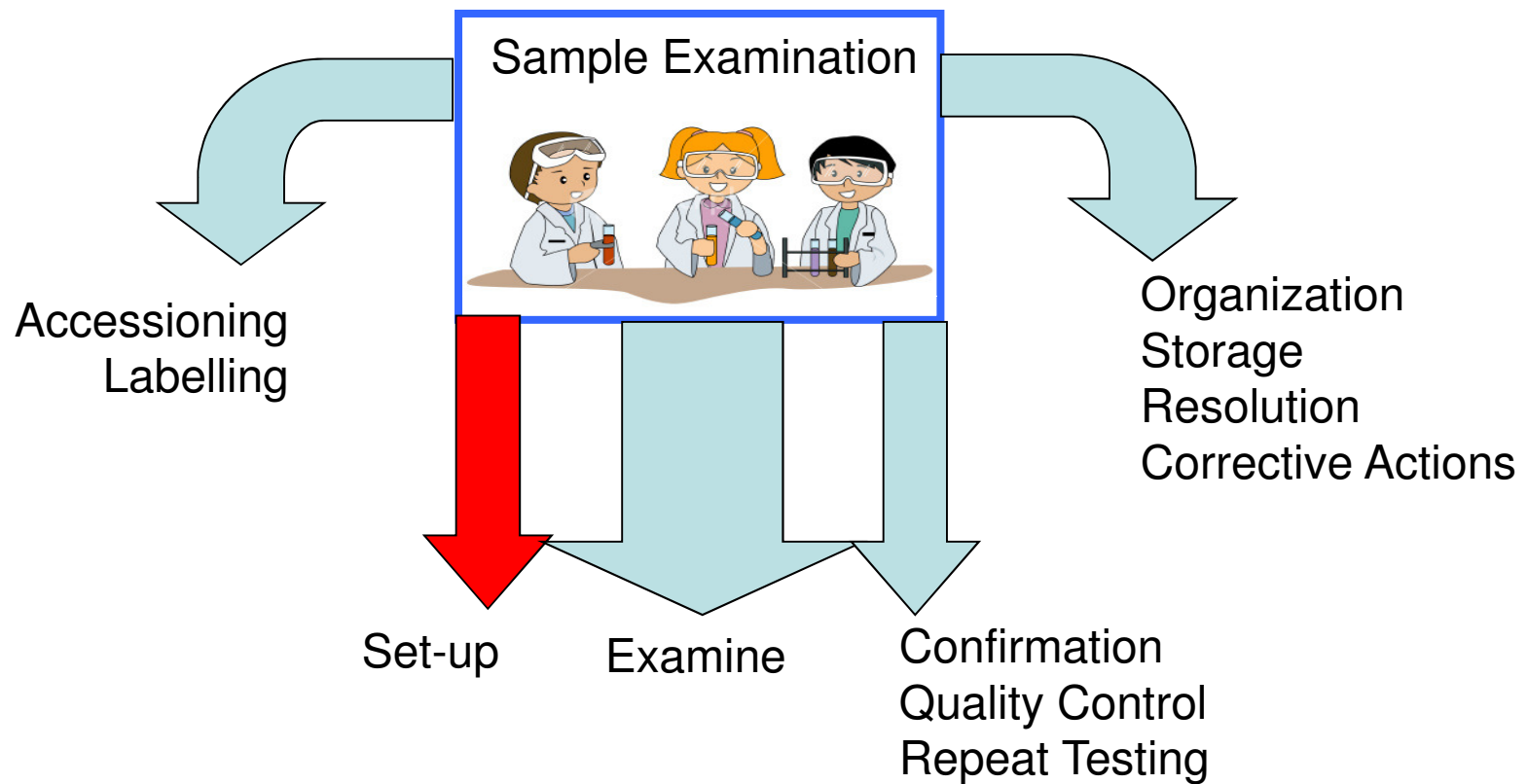
Examination Phase has many key components



Pre-Examination Error

- 40 percent of significant medical laboratory error occurs before the laboratory even begins to examine the sample
 - Wrong test is ordered
 - Wrong sample is collected
 - Sample is delayed in transport
 - Sample is transported incorrectly
 - Sample is incorrectly accessioned
 - Sample is incorrectly set-up

Examination Phase has many key components



Sample Preparation is a Microbiology Problem

- In Haematology major problems are wrong anti-coagulant tube or poor mixing.
- In Chemistry major problems are wrong tube or transport.
- In Cytology and Histopathology major problems are wrong fixative.
- ***Pre-examination error at every level affects Microbiology***

Microbiology set-up

- Setting up samples for microbiology examination is more complex because we have to take into consideration:
 - Patient variables
 - Sample variables
 - Microbial Variables
 - Test (media) variables
 - Media quality
 - Require sufficient non-selective media.
 - Require sufficient selective media.

Why does Microbiology Set-up Fail?

- Each sample has unique variables and circumstance.
- Laboratory is often unaware of most variables.
- Written procedures rarely take into account all the variables.
- Sample volumes are becoming increasingly concentrated.
- Staff are becoming increasingly overtaxed.
- Set-up space is under-staffed, under-spaced, under equipped, and cluttered.
- Technology changes affect sample set-up.
- Staff have little opportunity to consider variables even if declared.
- Set-up can not be performed in its most logical order.
- Staff rarely have access to informed decision makers.

Why does Microbiology Set-up Fail?

- **Each sample has unique variables and circumstance.**
 - Age, Gender,
 - Relevant Current Clinical Information
 - Underlying illnesses
 - Site specificity
 - Antimicrobial agents
 - Transport issues
 - Sample volume

Why does Microbiology Set-up Fail?

- **Laboratory is often unaware of most variables.**
 - Incomplete requisition information

Why does Microbiology Set-up Fail?

- **Written procedures rarely take into account all the variables.**
 - SOPs follow a given structure
 - The more the variables, the more the complexity of the SOP.
 - The more the complexity, the more likely there is to confusion and misinterpretation.
 - The more the complexity the less like the SOP is read or followed.

Why does Microbiology Set-up Fail?

- **Sample volumes are becoming increasingly concentrated.**
- **Staff are becoming increasingly overtaxed.**
- **Staff have little opportunity to consider variables even if declared.**
 - This is a world wide trend for the last forty years.
 - There is little reason to believe that it will improve over the next 10 years.

Why does Microbiology Set-up Fail?

- **Set-up space is under-staffed, under-spaced, under equipped, and cluttered.**

- Monitors
- Label makers
- Safety cabinets
- Bench space
- Staining stations
- Access to materials

- Communication
- Barcode readers
- Centrifuges
- Discard stations
- Handwash stations
- Access to consultation.

Why does Microbiology Set-up Fail?

- **Set-up can not be performed in its most logical order.**
 - Information gleaned from the gram stain would be very helpful to help make set-up decisions:
 - Neutrophils scattered or dense?
 - Intracellular bacteria?
 - Anaerobic morphologies?
 - For time and logistics, plate set-up is completed before the gram stain is read.

Why does Microbiology Set-up Fail?

- Staff rarely have access to informed decision makers.
 - In few laboratories do the workers in set up have the time or access to contact a microbiologist to assist in collection of information that would be valuable to improved the primary sample set up.

How to Minimize Microbiology Set-up Errors

- Improve relevant information
 - Establish “minimum” information requirements.
 - Develop improved rapport with clinicians
 - Telephone contact
 - Newsletters
 - Alerts
 - Cautionary notes
 - Informative notes

How to Minimize Microbiology Set-up Errors

- Establish a standardized set up protocol that is reviewed regularly and takes into consideration:
 - Non-selectivity
 - Selectivity
 - Cost
 - Complexity
 - Operability

How to Minimize Microbiology Set-up Errors

- Establish a set-up plan that is relevant to the setting.
 - Are there particular units or clinicians that are **most** likely to have immune compromised patients?
 - Are there particular units or clinicians that are **most** likely to have surgical wound infections?
 - Are there particular units or clinicians that are **most** like to have specific needs?

How to Minimize Microbiology Set-up Errors

- Create a written SOP that is clear with highlighted “alert-points” that indicate that special added features might be required.
 - Keep alert-points clear and to a minimum.
- Be specific about the alert-point actions.
 - Train set-up personnel to the SOP.
 - Monitor competency to the SOP.
 - Feedback competency to the SOP.

How to Minimize Microbiology Set-up Errors

- Create a written and controlled SOP that is clear with highlighted “alert-points” that indicate that special added features might be required.
 - TEXT?
 - TABLE?
 - FLOW CHART?
 - All three

How to Minimize Microbiology Set-up Errors

- Train, Monitor, and Feedback all personnel to the same information.

How to Minimize Microbiology Set-up Errors

- Inform set-up personnel of special changes that arise that will affect their work.
 - To the extent possible
 - Create a new SOP
 - Train to the new SOP
 - Monitor to the new SOP
 - Feedback to the new SOP

How to Minimize Microbiology Set-up Errors

- Provide available access to informed personnel who can assist in decision making for samples for additional variables and complexity.
 - Establish strategies for more complex samples
 - Delay set up until additional information is available.
 - Accept “standard” set-up with secondary delayed completion when additional information is available.

In summary...

All laboratory areas and disciplines are improved by the principles and practices of laboratory quality management.

- Set a plan, document it, train, monitor, and provide feedback to laboratory workers.
- When problems occur, remediate and correct and develop methods to prevent their occurrence.