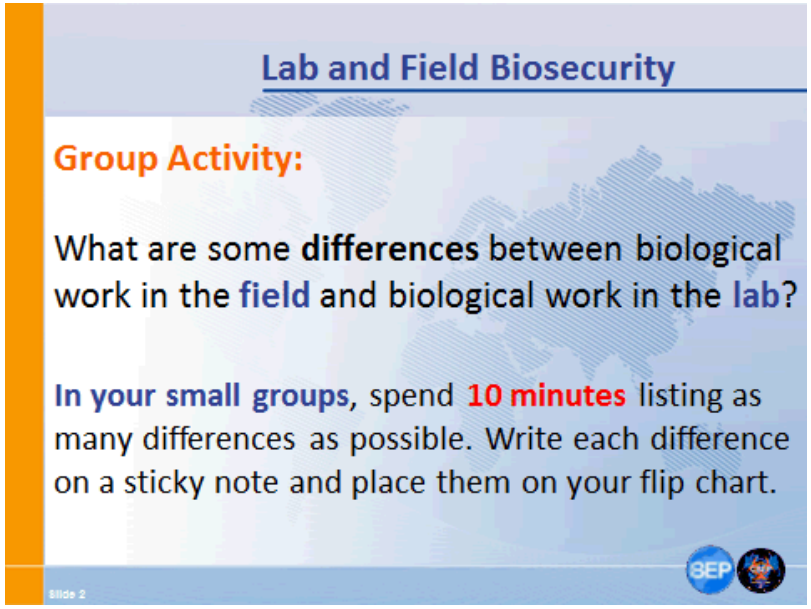
SAND2013-6791P

Laboratory Biorisk Management – Focus on MC&A, and Good Laboratory Work Practices

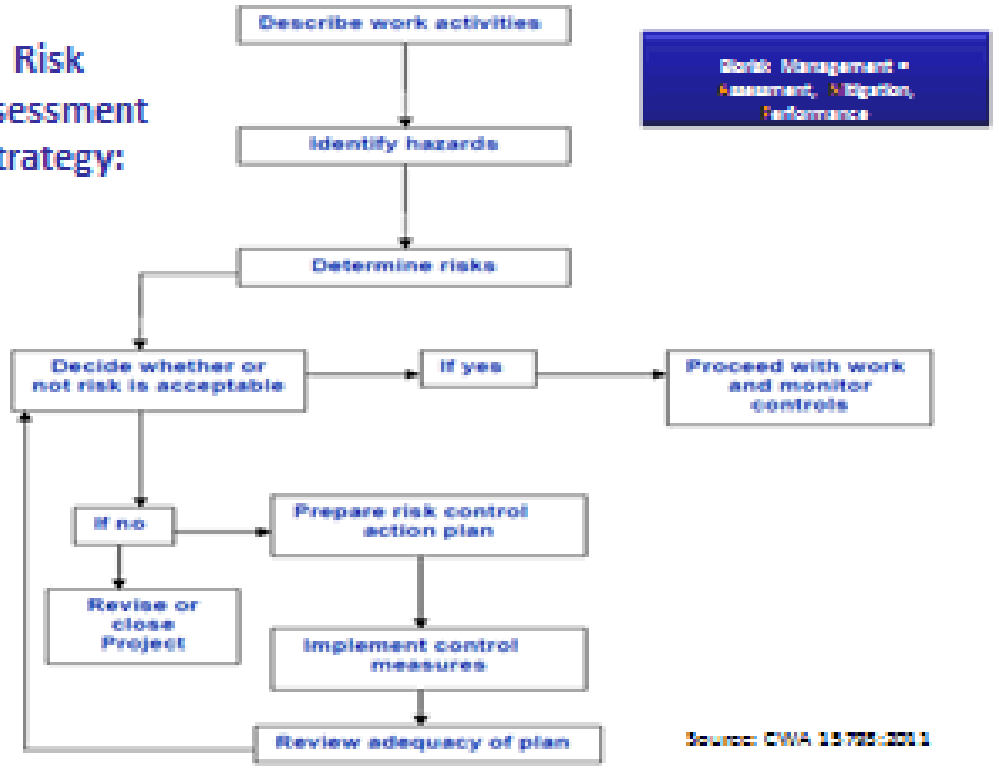
Student Guide


Laboratory Biorisk Management –
Focus on MC&A, Good Laboratory
Work Practices, & Decontamination
BEP
CBEP


Lab and Field Biosecurity
Group Activity:
What are some differences between biological work in the field and biological work in the lab?
In your small groups, spend 10 minutes listing as many differences as possible. Write each difference on a sticky note and place them on your flip chart.
Slide 2
BEP

Risk Assessment Strategy

Risk Assessment Strategy:



Source: CWA 15793:2011

Slide 7

Material Control & Accountability

The third "pillar" is **Material Control & Accountability**

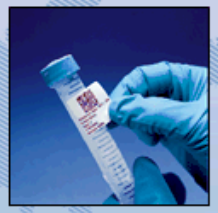
Material Control & Accountability is the assurance that there is an awareness of what exists in the laboratory, where it is, and who is responsible for it.

Slide 8

Material Control & Accountability

The Objective of **MC&A** is to:

- **Ensure the complete and timely knowledge of:**
  - What materials exist
  - Where the materials are
  - Who is accountable for them
- **Objective is NOT to detect whether something is missing.** This could be impossible. The objective is to create an environment that discourages theft and misuse by establishing oversight.
- Most laboratories already control and track their samples for scientific reasons. The emphasis here is that this is also important from a security perspective.



Slide 9

Material Control & Accountability

Key Issues in **MC&A**

- What materials are subject to MC&A measures?
- What operating procedures are associated with the materials?
  - Where can they be stored and used?
  - How are they identified?
  - How is inventory maintained?
- What records need to be kept for those materials? What timeliness requirements are necessary for those records?
- What does accountability mean?
- What documentation and reporting requirements?

Slide 10

Material Control & Accountability

Material Control & Accountability

What information should we keep track of?

Agent	Quantity	Form	Detail	Scope
Which agents?	Any amount of a replicating organism can be significant.	Repository Stocks, Working Samples, yes...	Materials as Items	Laboratory Strains? Wild-type?
Only viable organisms? Whole org. or just DNA?	For toxins, must define a threshold amount.	What about: In host? Contamination?	Each vial as a separate inventory record?	Clinical Samples?

Slide 11

Material Control & Accountability

Material Control & Accountability

- **Control is either…**
  Engineered / Physical
  Administrative
- **Containment is part of material control**
  Containment Lab / Freezer / Ampoule
- **Procedures are essential for material control**
  For both normal and abnormal conditions

Material Control & Accountability

Material Control & Accountability

All material should have an associated "accountable person" who is ultimately responsible for the material.

- The person best in a position to answer questions about the associated material
- Not someone to blame!
- Ensure that no material is "orphaned"


Material Control & Accountability
Material Control & Accountability
All material should have an associated "accountable person" who is ultimately responsible for the material.
– The person best in a position to answer questions about the associated material
– Not someone to blame!
– Ensure that no material is "orphaned"

Good Laboratory Work Practices

A **Good Laboratory Work Practice** is a practice, technique, or procedure that, when followed, has been demonstrated to ***protect*** lab workers and the environment and ***reduce the risk*** of exposure to hazardous agents.

Slide 17

Good Laboratory Work Practices

Group Activity:

Prepare a list of good laboratory work practices

Questions:

Are GLWPs only concerned with safety and security?

In your group, please spend **10 minutes** to create a list of GLWPs. Write each GLWP on a separate sticky note and place them on your flip chart. Consider the question as you think of your GLWPs.

Slide 18

Good Laboratory Work Practices

Questions:

- Why are good laboratory work practices so important?
- What is the risk of inadequate laboratory practices?
  - Increased risk posed to people and the environment
  - Increased risk posed by the hazard to people
  - Increased risk posed by people to each other

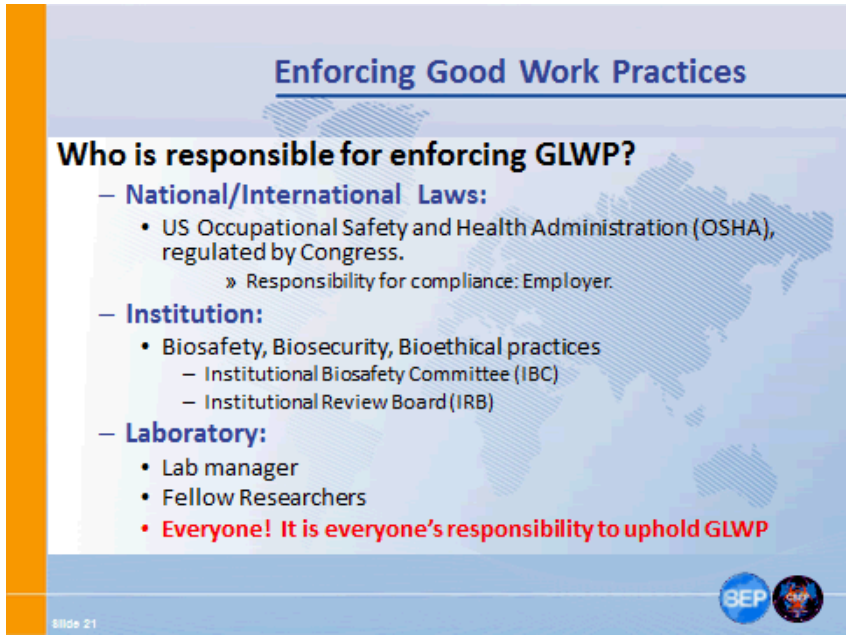
Slide 19

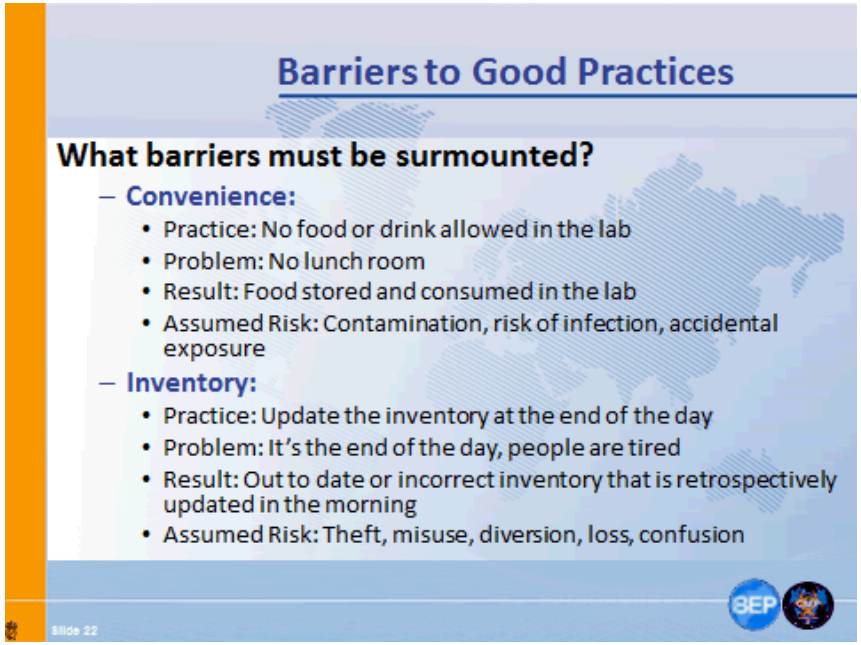
Supporting Good Lab Work Practices

Positive vs. Negative Reinforcement

- Positive reinforcement
  - Rewards for periods of no violations
  - Providing solutions to the violations
    - For example, a lunch table outside the lab so no food is brought or consumed in the lab
  - Training
- Negative reinforcement
  - Fines, punitive actions

Slide 20


Enforcing Good Work Practices
Who is responsible for enforcing GLWP?
– National/International Laws:
• US Occupational Safety and Health Administration (OSHA), regulated by Congress.
» Responsibility for compliance: Employer.
– Institution:
• Biosafety, Biosecurity, Bioethical practices
– Institutional Biosafety Committee (IBC)
– Institutional Review Board (IRB)
– Laboratory:
• Lab manager
• Fellow Researchers
• Everyone! It is everyone's responsibility to uphold GLWP
Slide 21


Barriers to Good Practices
What barriers must be surmounted?
– Convenience:
• Practice: No food or drink allowed in the lab
• Problem: No lunch room
• Result: Food stored and consumed in the lab
• Assumed Risk: Contamination, risk of infection, accidental exposure
– Inventory:
• Practice: Update the inventory at the end of the day
• Problem: It's the end of the day, people are tired
• Result: Out to date or incorrect inventory that is retrospectively updated in the morning
• Assumed Risk: Theft, misuse, diversion, loss, confusion
Slide 22

Identifying Poor Laboratory Work Practices

Class Activity:

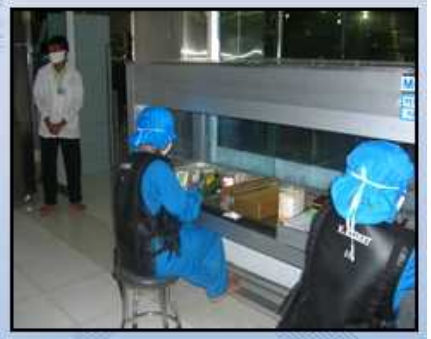
For each of the following scenarios and pictures, please identify the following:

- The **practice** that is being broken
- The **problem** that the modified practice is trying to "fix"
  - Ex: Eating in the lab. Problem "fixed": there is no lunch room
- The **Result**
- The **Assumed Risk**

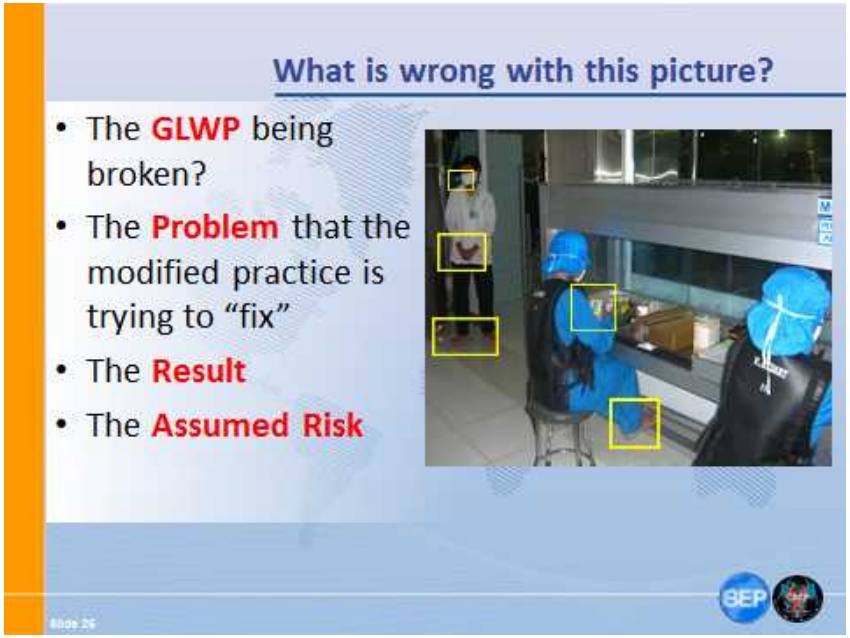
Slide 23

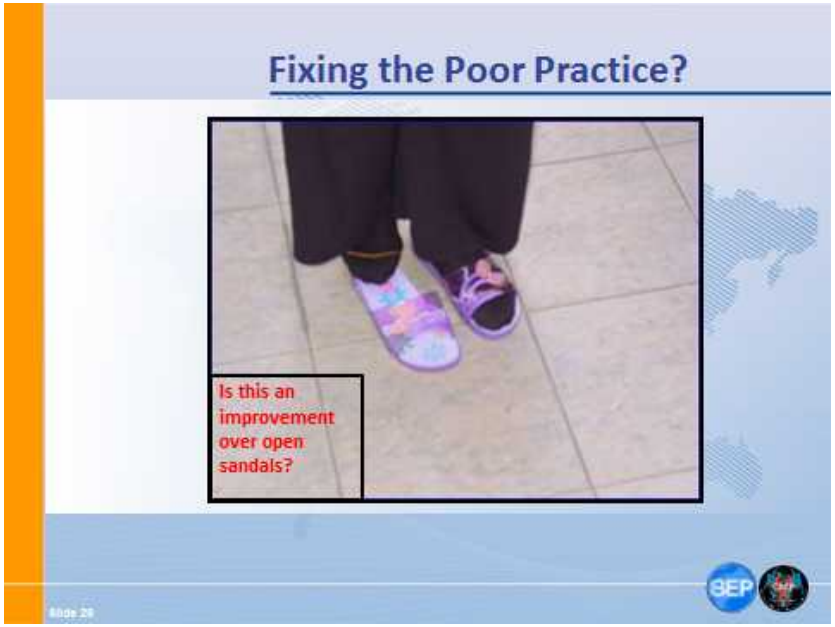
What is wrong with this picture?

- The **GLWP** being broken?
- The **Problem** that the modified practice is trying to "fix"
- The **Result**
- The **Assumed Risk**



Slide 24


What is wrong with this picture?
• The GLWP being broken?
• The Problem that the modified practice is trying to "fix"
• The Result
• The Assumed Risk


Fixing the Poor Practice?
Is this an improvement over open sandals?

What is wrong with this picture?

- The **GLWP** being broken?
- The **Problem** that the modified practice is trying to "fix"
- The **Result**
- The **Assumed Risk**

Slide 27

Practices Matter!

- **Is using a single risk mitigation strategy enough?**
  - **No** – every example shown, misused or misunderstood application of safety and/or security mitigation controls.
- **What can make the difference between success and failure?**
  - Personal responsibility
  - Training in the difference and reasoning between **Good Laboratory Work Practices** and **Poor Laboratory Practices.**

Slide 28