Biorisk Mitigation

Biorisk Management = Assessment, Mitigation, Performance
Review

What did you learn yesterday? What was new?

What new insights do you have from yesterday’s material? What are the implications of that learning?

What will you do with this information when you go home? What will you change at your institute?
Group Exercise 1, Step 1

Using your risk assessment for the HIV scenario, identify several different risk mitigation measures:

- for safety
- for security

Use a *post-it note* for each mitigation measure you identify.

Report on your answers to the class.
Group Exercise 1, Step 2

How would you categorize these mitigation measures?

Report on your answers to the class
Mitigation Control Measures

- **Engineering Controls**: Physical changes to work stations, equipment, materials, production facilities, or any other relevant aspect of the work environment that reduce or prevent exposure to hazards.

- **Administrative Controls**: Policies, standards and guidelines used to control risks.

- **Practices and Procedures**: Processes and activities that have been shown in practice to be effective in reducing risks.

- **Personal Protective Equipment**: Devices worn by the worker to protect against hazards in the laboratory.
Group Exercise 1, Step 3

Place your *post-it notes* in the appropriate columns on the flip chart:

<table>
<thead>
<tr>
<th>Engineering Controls</th>
<th>Administrative Controls</th>
<th>Practices and Procedures</th>
<th>Personal Protective Equipment (PPE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Report your results to the class
Group Exercise 1, Step 4

Considering these mitigation control measures:

Engineering/Administrative/Practices & Procedures/PPE

- Identify their advantages and disadvantages

Report your findings to the class
## Advantages/Disadvantages

<table>
<thead>
<tr>
<th>Control Measure</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>Efficient, eliminates hazard</td>
<td>Cost, complexity</td>
</tr>
<tr>
<td>Administrative</td>
<td>Authority approach</td>
<td>Indirect approach, primarily addresses the human factor</td>
</tr>
<tr>
<td>Practices &amp; Procedures</td>
<td>SOP based (standardized approach)</td>
<td>Training and supervision requirements</td>
</tr>
<tr>
<td>PPE</td>
<td>Ease of use, relative cost</td>
<td>Does not eliminate hazard, PPE fails exposure happens, uncomfortable, limits ability</td>
</tr>
</tbody>
</table>
Group Exercise 1, Step 5

Considering these mitigation control measures:

**Engineering/Administrative/Practices & Procedures/PPE**

- Prioritize the four types of controls from the perspective of effectiveness

  Most Effective  1  2  3  4  Least Effective

Record your findings on *post-it notes*

Report your findings to the class
Car Safety vs. Motorcycle Safety
Car Safety vs. Motorcycle Safety

Motorcycle safety is all about PPE

Car safety is all about engineering systems
Hierarchy of Controls (HOC)

- **Elimination or Substitution**
- **Engineering Controls**
- **Administrative Controls**
- **Practices and Procedures**
- **Personal Protective Equipment**

Control methods at the top of the list are in general more effective and protective than those at the bottom.
Group Exercise 2

In your groups, using the HIV scenario, reassess the risks by implementing the mitigation measures identified in Exercise 1

- **Biosafety**
- **Biosecurity**

Use the BioRam software to do the new assessments.

Document the new results on your charts.

Report to the class on risk reduction and mitigation effectiveness.
Mitigation measures most affect which side of the risk assessment equation?
Substitution
(using different materials)
affects what side of the
risk assessment equation?
Elimination
(not doing the intended work)
does what to the risk?
Ideally, you should first consider elimination or substitution.

A combination of control measures should be used based on their effectiveness and your ability to implement them.

‘acceptable risk’
The "Wow" Effect

A robust methodological approach to risk mitigation gives you the ability to:

- Justify decisions
- Evaluate the impact of certain risk mitigation decisions
- Compare the cost effectiveness of various risk mitigation decisions
Biorisk Management = Assessment, Mitigation, Performance

- Risk identification
- Hazard/threat identification
- Likelihood evaluation
- Consequences evaluation
- Elimination or Substitution
- Engineering Controls
- Administrative Control
- Practices and Procedures
- Personal Protective Equipment
Identification of Biorisks

- Biosafety Risk Assessment
- Biosecurity Risk Assessment

- Biosafety Risk Mitigation
- Biosecurity Risk Mitigation
Summary

Four categories of mitigation control measures

- Engineering Controls
- Administrative Controls
- Practices and Procedures
- Personal Protective Equipment

Implementing mitigation controls

- Should first consider elimination or substitution
- A combination of control measures should be used based on their effectiveness and your ability to implement them
- Should be based on the results of the risk assessment, and should give a “wow” effect