Discussion Topics
for patient biocontainment
PRESENTORS

Jeff Owens from HDR
Mark Fitzgerald from HDR
Natasha Griffith from UCLA
Patricia Olinger from Emory University
Cyndi McCoullough from HDR
Shawn Gibbs from UNMC
Balancing Design with Protocols

Protocol Mapping

• Mapping out step by step protocols identifies areas of risk and uncovers needs

• When risks are discovered design team works with the healthcare & biosafety personnel to solve with a combination of design and protocols

1. Nurse enters Donning / Anteroom
2. Nurse enters Patient Room
3. Nurse collects blood sample from Patient and collects soiled sheets
4. Nurse exits Patient Room and discards solid waste material in Autoclave
5. Nurse leaves blood sample in Laboratory for analysis
6. Nurse exits area
PROTOCOL MAPPING

<table>
<thead>
<tr>
<th>A-</th>
<th>Add</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-</td>
<td>Change</td>
</tr>
<tr>
<td>D-</td>
<td>Decontamination Procedure</td>
</tr>
<tr>
<td>R-</td>
<td>Remove</td>
</tr>
<tr>
<td>T-</td>
<td>Test</td>
</tr>
</tbody>
</table>

- SC Street Clothes
- FW Footwear
- GL Gloves
- EP Eye Protection
- UC Under Clothes
- BT Boots
- OP Over Pants
- VG Virus Gown
- HC Hair Covering
- SB Scrubs
- LC Lab Coat
- RP Respiratory Protection
- CT Hooded Coat
- CS Chemical Shower
- AS Air Pressure Resistant Suit
- BS Body Shower
- HW Hand Wash
- DR Disinfectant Rinse

* where required by RA

Outside

Work Room

Contained Corridor

Laboratory
Airflow vs. Differential Pressure

Pressure is a monitoring mechanism, not a containment mechanism

- \( \text{DP} = \frac{Q^2}{(2610A)^2} \)
- \( Q \) = air flow (cfm)
- \( A \) = total area (square feet)
- \( \text{DP} \) = differential pressure (inches of water)
Ante Room Performance

Ante Rooms vs. Airlocks

- Method:
  - Laboratory Protection Factor used as a measure of containment
  - $\text{LPF} = \frac{\text{Lab Aerosol}}{\text{Released Aerosol}}$
- Findings:
  - LPF is proportional to inflow velocity
  - LPF is not proportional to pressure differentials
  - Anterooms increase containment performance by a factor of 10 to 100

Alan Bennett, et. al., Development of Particle Tracer Techniques to Measure the Effectiveness of High Containment Laboratories, *Applied Biosafety*, 10(3) pp.139-150.
Figure 1: Risks posed by Nipha Virus prior to any implementation of Mitigation Measures
Figure 2 Risks posed by Nipah virus post implementation of procedural, engineering, and PPE control measures.
Decontamination

Validation of decontamination cycles

- Waste packaging
- BI/CI placement
- Cycle parameters
- Cradle to grave
Decontamination

Validation of decontamination cycles

- **DISINFECTION**: selective elimination of certain undesirable microorganisms in order to prevent their transmission

- **STERILIZATION**: complete killing of all microorganisms
Effluent Decontamination

And Interstitial Space

- Space Premium
- Ease of Access
- Operations & Maintenance
Security

- Perimeter Security
- Paths of Travel