

# **A Framework for Leadership and Training of Maximum Containment Laboratory Workers**

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# Maximum Containment Lab, ca. 1910



# Maximum Containment Lab, ca. 2009



# Rocky Mountain Labs Integrated Research Facility

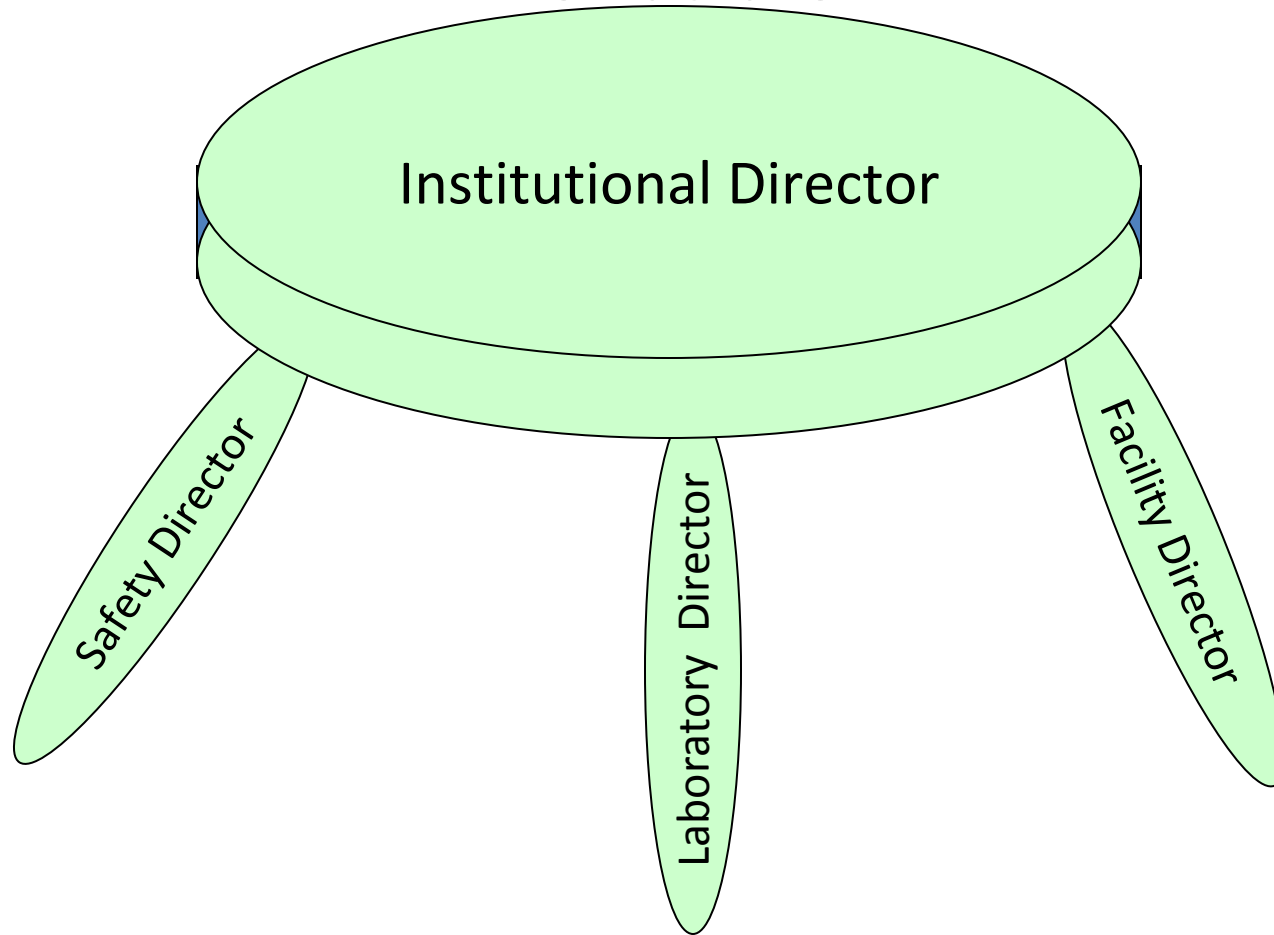
**A high-security Integrated Research Facility. There are BSL-2 and BSL-3 laboratory suites. In addition, there are a suite of laboratories and animal facilities designed for Biosafety Level 4 (BSL-4). Research being conducted in the area of emerging and re-emerging infectious diseases.**



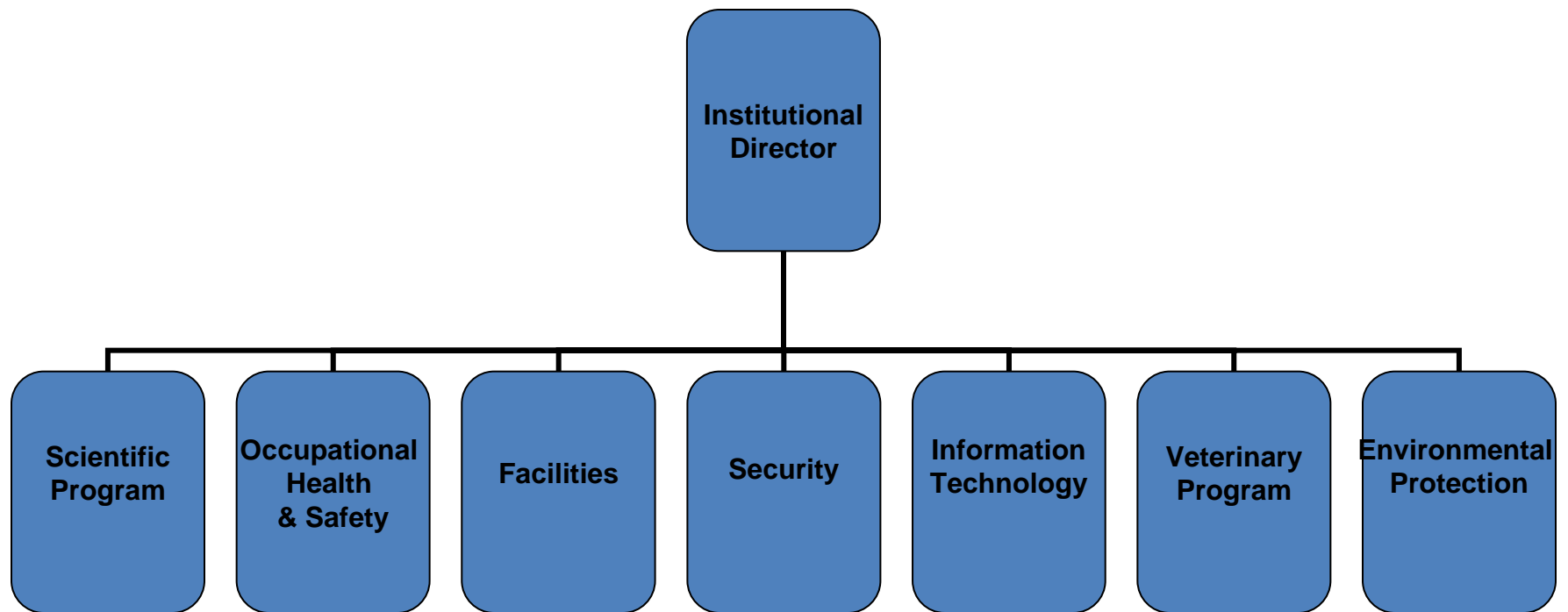
# Maximum Containment Laboratory Management Structure



# Traditional “Three-Legged Stool” Management Structure



# Enhanced Management Structure: Planning, Information and Logistics Team (PILT)



# The Big APPLE:

## Critical Interlocking Controls for Safe and Secure Containment Laboratory Operations



- **A**ministrative oversight
- **P**rotective equipment
- **P**rocedures  
(Laboratory)
- **E**ngineering features

Photo courtesy of New York Apple Association





# The Big APPLE:

## Administrative Oversight



- Training and supervision
- Medical surveillance
- Biosurety
- Immunizations
- Select Agent program
- Interdisciplinary oversight
- Adherence to procedures

Photo courtesy of New York Apple Association



# The Big APPLE:

## Protective Equipment



- Positive Pressure suits
- Gloves
- Hearing protection
- Glasses

Photo courtesy of New York Apple  
Association



# The Big APPLE:

## Laboratory Procedures



Photo courtesy of New York Apple Association

- Standard Operating Procedures (SOPs)
  - Entry and Exit
  - Decontamination
  - Emergency
- SOPs for all players: lab program, maintenance, safety, security, veterinary
- Strict adherence to SOPs!



# The Big APPLE:

## Engineering Features



Photo courtesy of New York Apple Association

### Redundant Systems

- Autoclaves
- Biosafety cabinets
- Liquid decon system
- HEPA filtration
- Access controls
- Breathing air
- Security and alarms
- Back-up power



# Elements of MCL Training

- **Didactic preparation**
  - Initial assessment
  - Training manual
  - Training modules
  - Evaluation
- **Practical hands-on training**
  - One on one with safety staff
  - Personalized and graduated
  - Use of training Laboratory
  - Orientation to facility
  - Evaluation



# Elements of MCL Training

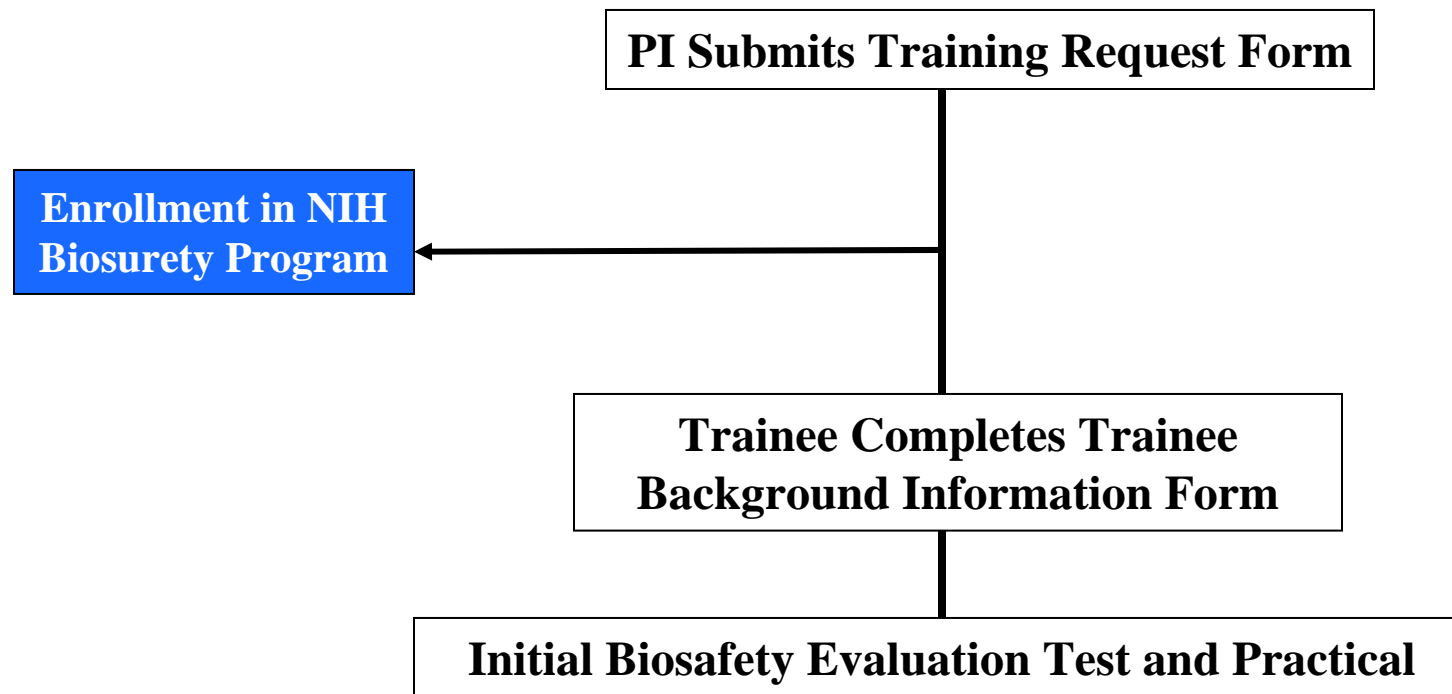
- **Mentored training**
  - Designated trainers
  - Work with infectious agents
  - Open-ended
  - Multiple staffs: scientific, technical, animal care, facility
- **Independent access**
  - Granted by Chief Scientist
  - May be task specific
- **Periodic reassessment**
- **On-going training**



**Implementation of  
Maximum Containment Laboratory  
Training  
at  
Rocky Mountain Laboratories**

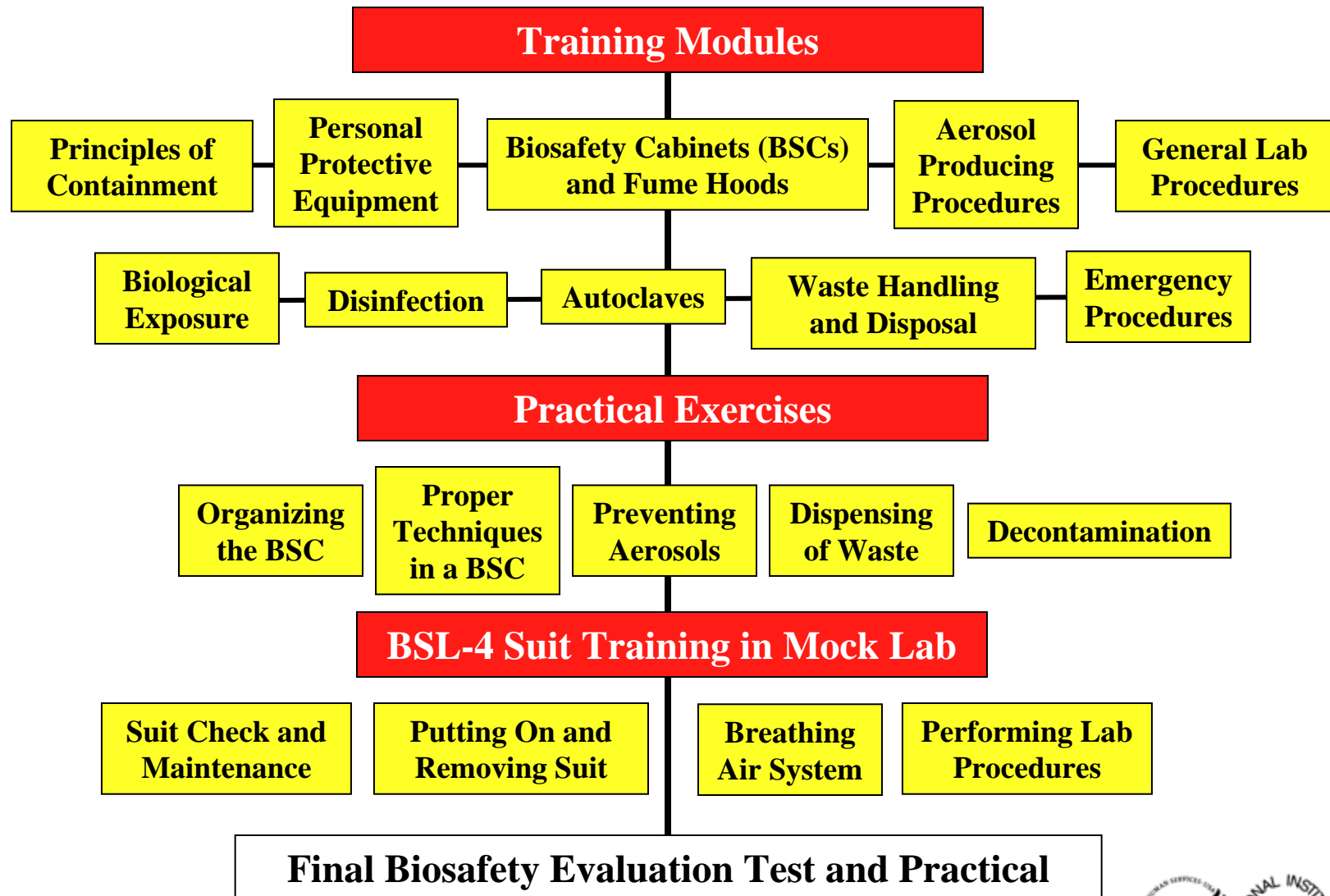


# Entry and Initial Assessments

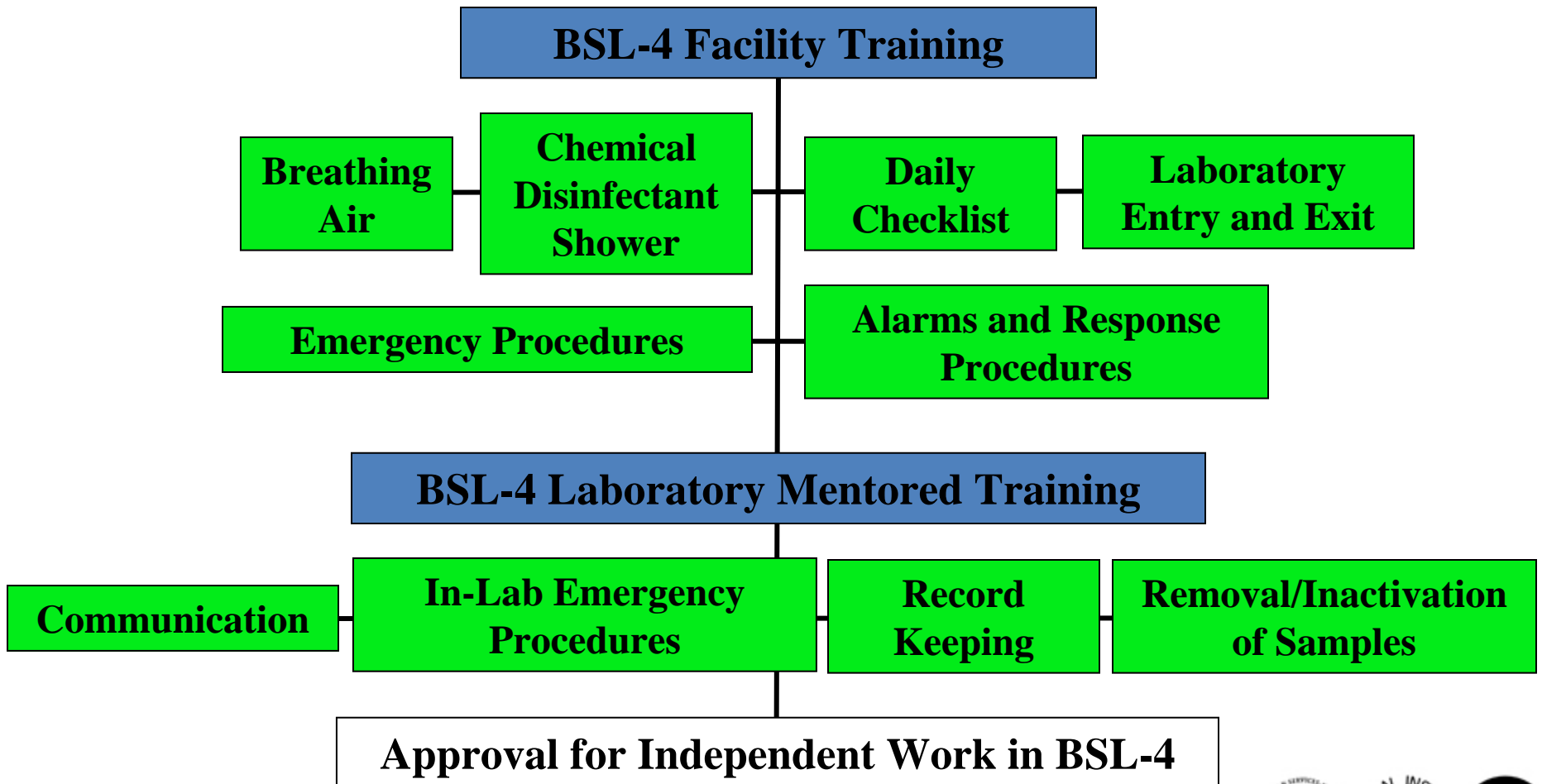




# Didactic and Practical Training

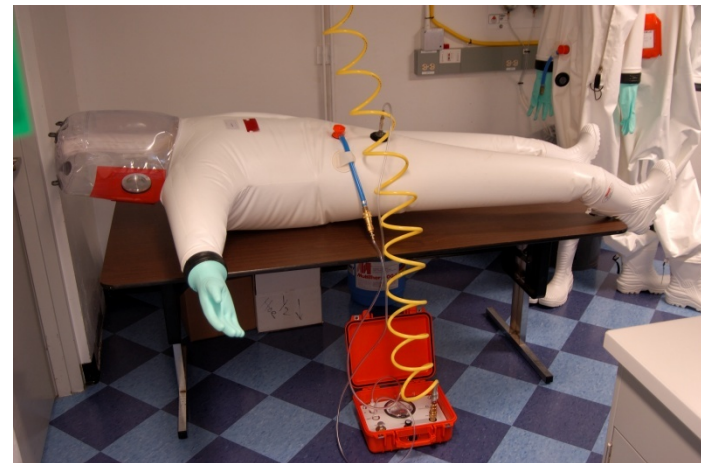


# BSL-4 Facility and Laboratory Mentored Training



# Training Laboratory

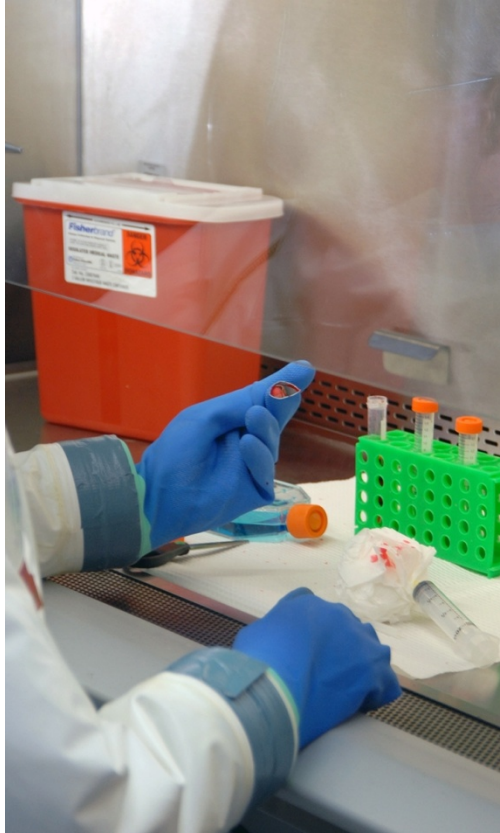
- “Mock” BSL-3/BSL-4 training laboratory
- Equipped with breathing air drops, positive pressure suits, a biosafety cabinet, other lab equipment
- Allows training under non-hazardous conditions
- Can also be used by BSL-3 and BSL-4 researchers to evaluate equipment prior to placing inside containment



# BSL-4 Biosafety Training

- Gain understanding of facility
- Learn donning and doffing of suit
- Practice emergency procedures





# Acknowledgements

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