Training Program: A 6 Year Story

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Acknowledgment

- Training team
  - Vickie Jones
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  - JeT Newton
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  - Sarah Ziegle
  - Dee Zimmerman
  - Sharon Walters

- UTMB Faculty
- Administration
- Trainees
- Funding agencies
Rules & Expectations

• Regulations/guidelines set forth by agencies such as CDC/Select Agents, USDA/APHIS, NIH/OBA, WHO, government, local regulations, etc...

• General public expect to be safe

• Laboratory personnel and support staff expect to be safe

• Consequences of incidents can be devastating
New Era of Training

- Increased public interest and regulatory requirements for standardization of training
  - Core competency
  - Two phase training
  - Focus training
  - Documentation
Principles of Education

- Human nature is to hide our mistakes
- Philosophy to encourage staff to report incidents and accidents...
- Develops safety awareness
- Develops an institutional safety culture
- Education not perceived as punishment
Success of the Training Program

- Have the right people involved from the beginning
  - Biosafety group
  - Upper management
  - Principal investigators
  - Laboratory directors
  - Consultants
  - Occupational Health
  - Administration

- Support from the laboratory Directors and Principal Investigators

- Support from the Institution

- Support from other institutions (outsource your needs/collaboration)
Training Process

- Basic evaluation of theory and skills of individual
- Training is specific to each researcher’s needs and past experience
- One-on-one hands-on training program for BSL3 & 4

Labor intensive, but focuses on individual needs.
Courses Offered

- **BSL1**

- **BSL2**
  - Select Agent labs, mandatory

- **BSL3 - BSL4**
  - Mandatory all users

- **ABSL2**
  - Select Agent labs, mandatory
  - Mandatory all users

- **ABSL3**
  - Mandatory all users

- **Animal handling skills**
  - All species all biosafety level

- **NHP course**
  - Mandatory at UTMB
  - Training per Biosafety level/ per skills
  - Annual refresher

- **Graduate students**
  - 2 credit hrs

- **Specialized courses**
  - Testing of safety equipment
Training Program at UTMB...

May-Oct 2005
- BSL3 First course (May)
- BSL2 first course (June) / ABSL3 theory course (August)
- Pathology mandatory
- Grad school 6122 (Sept)
- UTMB internal funding (2 year grant) (Sept)
- Mandatory BSL3/ABSL3 training per facility Directors (Oct)

Sept 2006
- BBSC 6217 grad school course mandatory
- New Training laboratory (June)
- CTPS 6203 course: BSL3 training certificate

May-Aug 2009
- CTPS 6112 course: BSL2 training certificate (August)
- CTPS 6114 course: ABSL2 training certificate (August)
- ABSL2 training program theory & practicum (Jan)
- NHP training program (Jan)
- Pathology mandatory
- Grad school 6122 (Sept)
- Western Regional Center of Excellence (RCE) grant 1 extra staff

Jan-August 2010
- New Training laboratory (June)
- CTPS 6203 course: BSL3 training certificate
- 4 new staff

Jan-Dec 2011
- DOD grant
- National Biocontainment Training Center
- 1 new staff

March 2012
- ABSL2 training mandatory (IACUC) starting date Sept
- CTPS 6118 course: ABSL 3 training certificate
- March 2012 CTPS 6118 course: ABSL 3 training certificate

April 2012
- ABSL2 training mandatory
- (IACUC) starting date Sept

1 New staff
Total number of students May 2005-Sept 2012
Course outline
Comparaison between BSL3 pre and post written test average % grade/section

<table>
<thead>
<tr>
<th></th>
<th>Average Pre BSL3 (n=48)</th>
<th>Average Post BSL3 (n=48)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biocontainment</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>PPE</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Biosafety cabinets</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>Aerosol production</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Human products</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Transportation of material</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>Emergency procedures</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Disinfection/Cleaning</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Autoclave &amp; waste</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>over all grade</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>
Comparaison between BSL3 pre-post written test following BSL2 training - average % grade/section

<table>
<thead>
<tr>
<th>Section</th>
<th>Average Post BSL2 (n=8)</th>
<th>Average Pre BSL3 (n=8)</th>
<th>Percentage grade difference %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labeling aerosol production</td>
<td>-5.3%</td>
<td>5.6%</td>
<td>-10.9%</td>
</tr>
<tr>
<td>PPE</td>
<td>-24.1%</td>
<td>20%</td>
<td>-24.1%</td>
</tr>
<tr>
<td>Bioafety Cabinet</td>
<td>-9.6%</td>
<td>9.3%</td>
<td>-18.9%</td>
</tr>
<tr>
<td>Disinfection autoclaving</td>
<td>-7.7%</td>
<td>8.1%</td>
<td>-15.8%</td>
</tr>
<tr>
<td>Waste handling</td>
<td>-15.8%</td>
<td>17.2%</td>
<td>-33.0%</td>
</tr>
<tr>
<td>Over all grade</td>
<td>9.3%</td>
<td>8.1%</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

Average time between training: 3.8 months
Range: 1-8 months
### Average number of training sessions

<table>
<thead>
<tr>
<th></th>
<th>Number of hands on session</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSL3 training</td>
<td>2.0 ± 0.8</td>
</tr>
<tr>
<td>BSL 2 training</td>
<td>2.9 ± 0.9</td>
</tr>
<tr>
<td>BSL3 training following BSL2</td>
<td>1.9 ± 0.9</td>
</tr>
<tr>
<td>BSL3 training without BSL2 first</td>
<td>2.1 ± 0.9</td>
</tr>
</tbody>
</table>
Lessons Learned

• Documentation
• Registration process
• Human nature
• Research pressures
• Growing pains
• Challenges of growth
Documentation

• Evolution with time
  • Storage of documentation
  • What is critical information
  • Legal retention time and format

• Certificates / Letters
  • Additional information on the animal certificates to capture species and techniques
  • Capturing time spent with students per course
  • Sent by mail or electronically

• Keeping communication with students
Registration

- Becomes more complex with time
  - None needed
  - Basic information and a supervisor signature
  - No signature but additional information
- Structured process with predefined steps to be completed in a specific order
Access process to containment laboratories

BSL3

ABSL2

NHP

BSL4

ACL3

Students

BSL3

ABSL3

UTMB
Human nature

- Everyone is special!
- Everyone’s project is critical
- Each student needs training done by yesterday
- Lack of organization/communication
Research pressures

- Grant deadlines for data collection
- Visiting scientist, students onsite for short period of time
- Graduate students
- Staff turnaround
Growing pain

• The more individuals are involved the more structured a process needs to be
  • Cannot “wing it” or “go with the flow”

• The more oversight is needed to ensure processes are followed

• Issues become harder to handle and blow out of proportion faster

• Customers become more demanding and less understanding
Challenges of growth

• Balancing the needs of the researcher
  • Maintaining flexibility of training both in schedules and topics
  • With the program capabilities

• Maintaining a consistent training message among trainers

• Increase cost of business

• Adapt program and courses without loosing the core philosophy

Quality versus Quantity
Resources needed

- Dedicated facility
- Dedicated trainers
- Dedicated support staff
Dedicated training facility
LBTP staff were all originally laboratorians, trained in biocontainment labs along side research staff in our different labs

• 4 full time trainers
• 3 part time trainers
• 1 full time Sr. administrative support staff
• 1 part time support staff
Conclusion

• By training staff in a progressive manner you can ensure
  • Better knowledge of material
    • Increased comprehension from BSL2 trainees moving to 3 than direct BSL3 trainees
  • Less time spent in practical training
    • Average 1 training session (equivalent to 2-3hrs/trainee)
• Ever lasting changes in the program
• Need to work closely with researchers and upper management for the program to succeed
National Biocontainment Training Center

- DOD Grant Funded
- Provides training to all National Entities at no cost. (except travel expenses)
- On-site and off-site training
- Offers
  - 2 Research Fellowships
  - 2 Engineering Fellowship
Q & A