Objectives

1. Give examples of different risks that diagnostic labs have that research labs typically do not have.

2. Recognize that potential Brucella exposures may occur in diagnostic lab locations other than the diagnostic microbiology lab.

3. Outline the roles of Employee Health, Infection Prevention, diagnostic microbiology leadership, Public Health Epidemiology and Public Health Lab, and CDC in responding to a Brucella exposure event.
Different risks for different labs

DIAGNOSTIC MICRO LAB

• Every specimen has BBP risk
• Every specimen likely to have > 1 cultivable microbe
• Focus on rapid, clinically relevant testing to enhance patient care
  • Fast paced; get work done during your shift

RESEARCH LAB

• BBP only if human serum or tissue
• IBC approved microbes used
• Focus on pushing frontiers of scientific knowledge forward
  • Variable focus on getting work done
Different risks for different labs

<table>
<thead>
<tr>
<th>DIAGNOSTIC MICRO LAB</th>
<th>RESEARCH LAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Procedures and policies well-defined and followed.</td>
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<tr>
<td>• Documentation emphasized</td>
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<tr>
<td>• Lab space defined for biosafety and efficiency</td>
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<tr>
<td>• Biosafety levels are 1, 2, 2 with enhancements or 3</td>
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<tr>
<td>• Annual biosafety training</td>
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<tr>
<td></td>
<td>• Procedures and policies less well-defined; oversight less structured.</td>
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<tr>
<td></td>
<td>• Documentation as good as the documenter</td>
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<tr>
<td></td>
<td>• Contiguous lab spaces for multiple investigators with some BSL2 spaces</td>
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<tr>
<td></td>
<td>• Biosafety levels based on risk assessment, usually 1 or 2</td>
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<tr>
<td></td>
<td>• Annual biosafety training</td>
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</tbody>
</table>

Different risks for different labs

<table>
<thead>
<tr>
<th>DIAGNOSTIC MICRO LAB</th>
<th>RESEARCH LAB</th>
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<tbody>
<tr>
<td>• OSHA: handwashing sinks, eye washes, air flow, chemical hazards</td>
<td></td>
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<tr>
<td>• Infection Prevention: risk assessment, assure policy compliance, investigate exposures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• OSHA air flow and chemical hazards</td>
</tr>
<tr>
<td></td>
<td>• Infection Prevention involved only if research in clinical areas.</td>
</tr>
</tbody>
</table>
Blood culture processes

When positive Day 1, 2, ...

Blood culture processes

After overnight incubation

Receipt in lab

8 Gram positive bacteria
10 Gram negative bacteria
5 yeasts
3 resistance mechanisms
10th
Positive blood culture removed from instrument
Subculture & Gram stain made in BSC
Gram stain not read as suggestive of *Brucella*

11th
Subculture read on benchtop: “no growth”

12th
Subculture read on benchtop: possible *Brucella*
Gram stain review by Supervisor: possible *Brucella*
Additional testing performed in BSC

13th
SCDHEC Special Pathogens Lab (SPL) notified
Specimens, cultures, Gram stain slides sequestered
Notified Infection Prevention of exposures
Subculture sent to SPL for *Brucella* PCR
Decon with 10% bleach: all surfaces ≤ 5 ft of open plates and work surfaces within 5-10 ft
Notified reference labs that received serum for testing
Presumptive positive PCR & next steps called
Determined personnel exposed in micro

SLP provided guidance for risk assessment to Lab management, IP, EH
Management of *Brucella suis* exposures:

**HIGH RISK**
- 8 microbiology staff or trainees within 5 ft of open plates
- Post-exposure prophylaxis initiated within 48 hours of *Brucella* ID
- Baseline serum samples obtained
- Symptom monitoring started

**LOWER RISK**
- 28 staff in various lab sections within 10 ft of opening a flip capped aliquot of the whole blood and pipetting on a bench top
- Ruled minimal but not zero exposure
- F/U monitoring not required

Interdisciplinary roles in response to *Brucella suis* exposure event

- Public Health Epidemiology and Public Health Lab: risk assessment guidance, Select Agent forms completion, advice
- CDC: guidance, reviewed Select Agents forms
- Diagnostic microbiology (DM) leadership: conducted risk assessment & questionnaires, completed Select Agents forms, conducted training, coordinated serum collections
- Infection Prevention: risk assessment guidance, assure policy compliance, work with Employee Health to investigate exposures
- Employee Health: monitored surveillance logs and serology testing for high risk exposures
Possible changes due to risk reassessment

CHANGES MADE

• Positive blood culture subcultures with no ID by multiplex PCR are incubated in separate rack from those with IDs and are handled in BSC until Brucella ruled out
• Re-educated techs on Brucella Gram stains
• Send 1-2 techs annually to SCDHEC for biosafety training

CHANGES NOT MADE

• Purchase “smart incubators” to prevent exposure before colonies grow on plates

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<table>
<thead>
<tr>
<th>Known knowns (risks well known)</th>
<th>Known unknowns (risks aware of)</th>
<th>Unknown unknowns (risks so rare, never considered)</th>
<th>Unknown knowns (refuse to accept risk)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>S. aureus</em></td>
<td><em>M. tuberculosis</em></td>
<td><em>B. anthracis</em></td>
<td>Biosafety failures</td>
</tr>
<tr>
<td><em>Shigella</em></td>
<td><em>N. meningitidis</em></td>
<td>Hantavirus</td>
<td>Atypical organisms</td>
</tr>
<tr>
<td><em>P. aeruginosa</em></td>
<td><em>Brucella</em></td>
<td>SARS Coronavirus</td>
<td></td>
</tr>
<tr>
<td><em>Coccidioides</em></td>
<td><em>Francisella</em></td>
<td>Unidentified pathogens</td>
<td></td>
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</table>
Hunting feral hogs

2018 - 2019 Regulations - Feral Hogs

Feral hog hunts occur in the wild in every county of the state. They can destroy crops, harm wildlife species, damage farms, and threaten public health. It is illegal to remove a hog from the wild unless it is taken pursuant to a permit issued by the SCDNR at a cost of $10 (SC 12-6-25).

All hogs taken pursuant to a permit must be trapped by each out-of-state holder. A permit cannot be issued to a person who has never held a permit issued by the SCDNR for hog hunting. A permit issued by the SCDNR cannot be transferred nor resold to another person.

Saline Brecciollii

Saline Brecciollii is caused by a bacteria and is primarily a reproductive tract disease in wild pigs. It can be transmitted to humans and is regulated by the U.S. Department of Agriculture. The disease can cause inflammation, swelling, and joint pain in domestic hogs. The disease is transmissible to humans and can cause serious illness.

1. Use disposable rubber gloves and wash hands after handling the carcass.
2. Never touch or handle the carcass if you have cuts or sores.
3. Report any sick hogs to your local veterinarian.
4. Remove the carcass to a different area.
5. Wash hands thoroughly with soap and water after processing.