DLS ECHO Biosafety Session: July 18, 2023

Biosafety Challenges in Alaska

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Agenda

- Didactic and Case Presentation
- Discussion
- Summary of Discussion
- Closing Comments and Reminders

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Biosafety Challenges in Alaska

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State of Alaska Public Health Laboratory
July 18, 2023

GEOGRAPHICAL ISSUES

- Road system limitations
- Distance between villages and Hub Communities
- Flying samples and patients
- Internet connectivity (Western Alaska fiber optic issues)
- Influx of seasonal workers
- Training Delivery (in person or virtual)

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CLINICAL SENTINEL LABORATORY LOCATIONS

- Anchorage (4)
- Bethel
- Dillingham
- Fairbanks (2)
- Homer
- Juneau
- Ketchikan
- Kodiak (Sort of)
- Kotzebue
- Nome
- Petersburg
- Sitka (2ish)
- Soldotna
- Valdez
- Wasilla

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THE GEOGRAPHY OF ALASKA LABORATORIES

SPECIMEN AND PATIENT TRANSPORT

SPECIMEN AND PATIENT TRANSPORT

- Ground shipments only viable near Anchorage, most shipments fly even on the road system
- FedEx and UPS serve only a few communities off the road system at a significant cost
- Alaska Air Cargo has offices in Hub communities
  - AK Air Goldstreak is the most effective way to transport to Anchorage
- Only Anchorage, Fairbanks, Juneau can accept Category A shipments

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SEASONAL WORKERS

- Total State population 736,000
- Anchorage 291,000, Mat-Su valley 109,000, Fairbanks 32,000
- Most Alaska hub communities have a population of 1000-8000 residents

- Total seasonal workers can be up to 330,000 between commercial fishing and tourism
- Communities also hire seasonal healthcare workers

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TRAINING DELIVERY

- Remote
  - live training
  - asynchronous
- In person,
  - hosted at PHL
  - On-site (Roadshow)

ALASKA IN PERSON TRAINING

- Main training components for On-site and in person
  - IATA/DOT Infectious materials shipping training
  - Risk Assessments (If I can convince them to do it)
  - Principles of Laboratory Biosafety and Biosecurity
  - BSC operation
  - Wet Workshop Roadshow
    - Surrogate BT organisms
    - ASM and APHL Blue Book rule-out algorithms
    - Biochemical tests
    - Gram Stains

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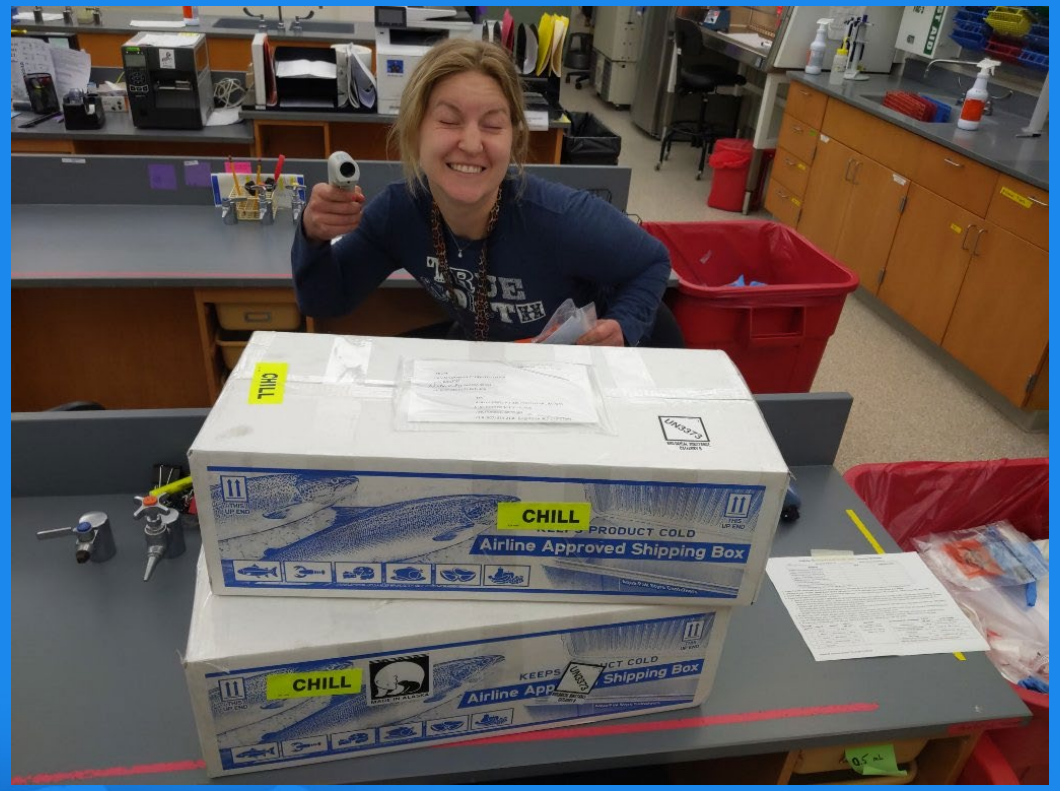
SHIPPING CATEGORY B

- Utilizing what you have available
  - COVID shipper during commercial fishing season



BSC TRAINING WITH PORTABLE FOG MACHINE


breeze

WET WORKSHOP ROADSHOW

- Surrogate strains and organisms are grown at the state lab, plates are sealed and packaged in a Category B shipper, and Goldstreaked to sentinel lab c/o myself
- Discuss and review colony morphology
- Gram stain practice
- Review available biochemical tests
- Review ASM or APHL rule-out algorithm
- Talk about any differences between surrogates and Wild-type strains
- Discuss waste handling, where does lab trash go?

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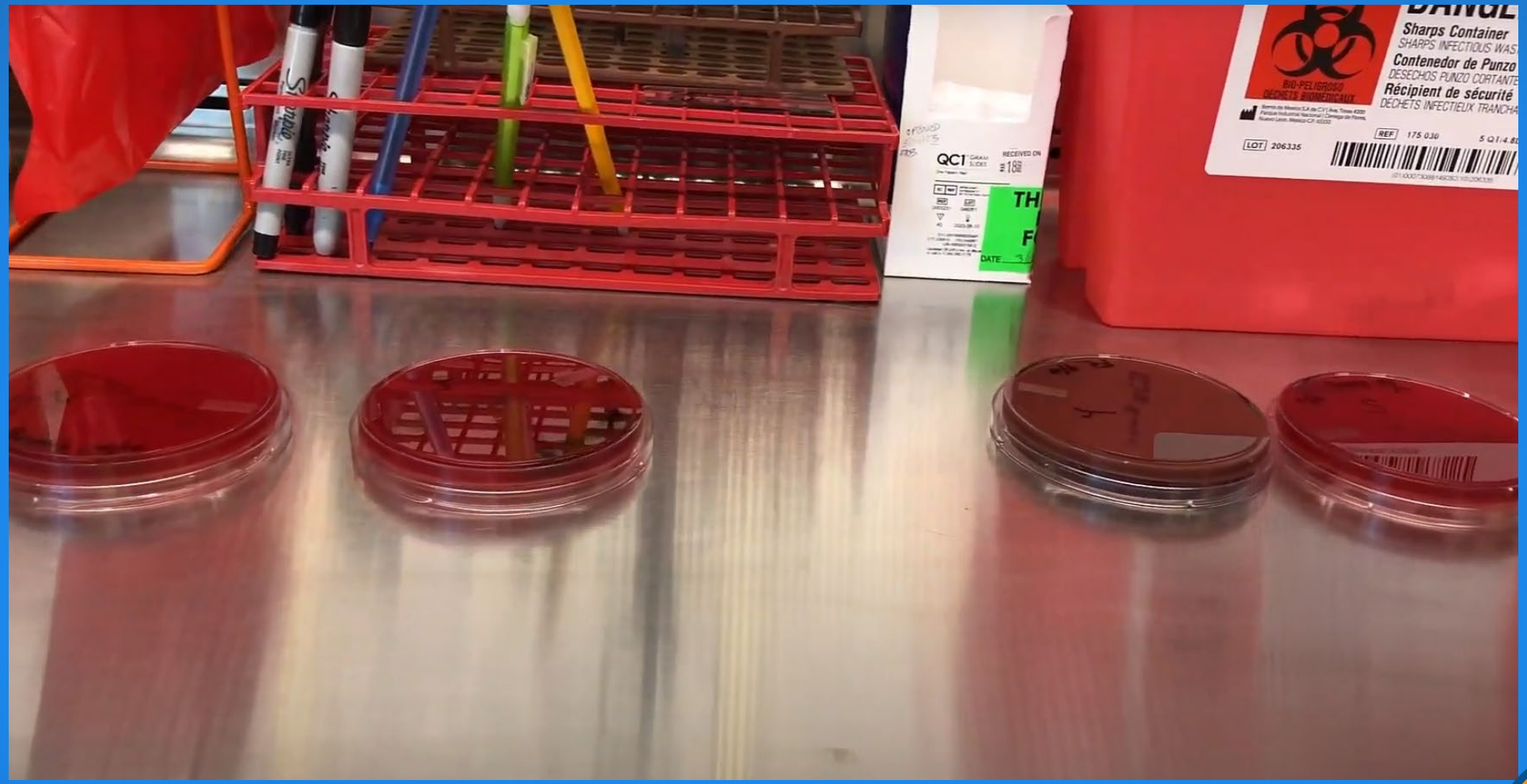
ROADSHOW – COLONY MORPHOLOGY



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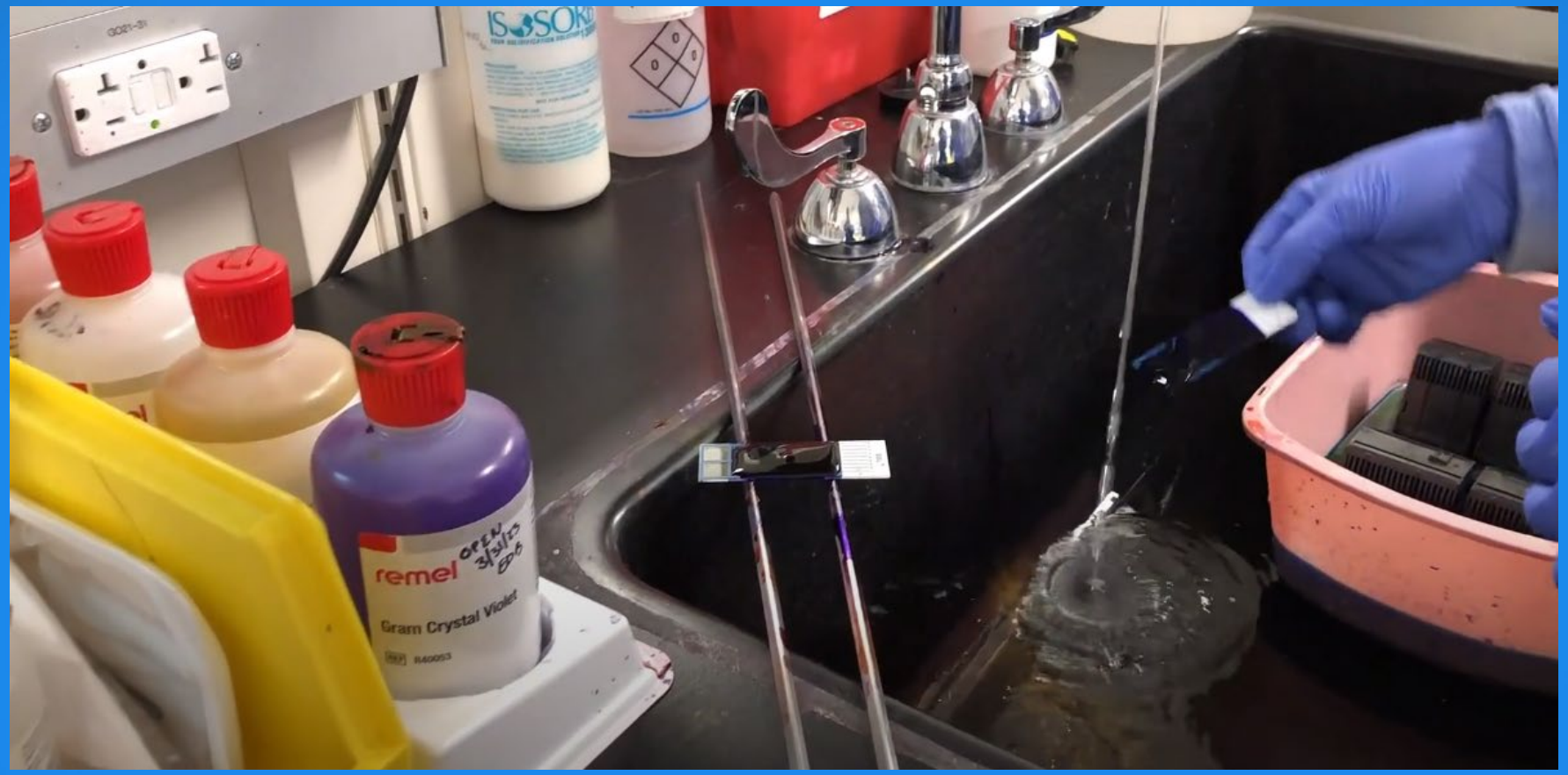
ROADSHOW - GRAM STAINING



ROADSHOW – COMMON ALASKA AGENTS

- BT Rule-out Agents
  - Brucella suis in AK caribou herds – WT cell morphology is much larger than surrogates or Brucella canis
  - Francisella tularensis in rabbits and hares – pretty typical morphology
- Clostridium botulinum and neurotoxin –Type E
  - Traditional Alaska Native foods, fermented marine animal products
  - Seal oil, muktuk, anything fermented
  - Rare cases of poor canning of fish
  - Occasional infant type A

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ROADSHOW – BOTULISM

ROADSHOW – BOTULISM SAFETY

- Challenges in sample handling
  - Collection from patient homes (mostly handled by public health nurses or community health aids)
  - Cultural sensitivity, traditional Native Alaskan foods and preparation methods
  - Quantity of sample, gallons of seal oil or a whole walrus flipper
  - Disposal of contaminated foods

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CASE STUDY 2017

- Patient presented to the ER with a wound from a cat-bite on his hand that was not healing.
- ER orders a wound culture

CASE STUDY 2017

- Tiny Colonies at 48 hours on Blood and Choc.
- Opened the plate on the bench top to read and prep Gram stain and catalase.
- Microbiologist noted gram stain was tiny faintly staining Gram (-) coccobacilli, and was catalase negative

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CASE STUDY 2017

- Micro asked for the department supervisor and another lab employee to review the plates shortly after working with cultures on the bench and performing catalase on the open bench.

CASE STUDY 2017

- Micro was starting to suspect a biothreat agent and moved work into biosafety cabinet to finish rule-out testing.
- Culture was oxidase negative and had a strong beta-lactamase reaction.
- Set up a satellite test which was negative the following day.

CASE STUDY 2017 - TULAREMIA

- Micro and supervisor both agree that culture is a suspect Francisella tularensis.
- Package and ship specimen to State Public Health Lab for confirmatory testing (that was me).
- Consult with State Epidemiology and begin prophylactic antibiotics
- I confirm F.t. the same day as I received the culture (1 day post exposure).

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CASE STUDY 2017 - TULAREMIA

- Micro staff use this exposure to request a new 6′ wide BSC to be installed in their micro lab. Their lab only had a small 3′ cabinet that made setup, reading, and biochems too difficult.
- Changed protocols so that all culture setups and plates are read in the BSC. Slides are setup and all biochemicals are performed in the BSC as well.
- Instituted a biothreat checklist for all cultures, goes through gram stain and all biochemicals. We have since shared this checklist with all sentinel labs in the state and many have adopted it.

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THANK YOU FOR LISTENING.

ANY DISCUSSION OR COMMENTS ARE WELCOME

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DLS ECHO Biosafety Session: August 29, 2023

Safety Challenges with Specimen Collection, Transport, Accessioning, and Storage

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