MAKING THE MOST OF YOUR FIELD NECROPSY

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“YOU SHOULD NEVER LET A DEAD BODY GO TO WASTE” -Dr. Mary Smith

ATTIRE
Thorough external visual exam—eyes, ears, nose, mucosa, joints, feet, mammary gland (express milk), skin, vulva/rectum. Take photos (ID tag) and send them to the lab. Collect a full set of samples!
**FORMalin FIXED SAMPLES**

- Fix everything!
- Histo $160 for field necropsy regardless of # of tissues

**FIXED TISSUE SET**
- Lung (section from each lobe)
- Liver (section from each lobe)
- Spinal cord
- Spinal root
- Heart
- Kidney
- Spleen
- Intestines
- Lymph nodes
- Adipose tissues
- Skin
- Skeletal muscle
- Brain
- Heart
- Brain
- Uterus
- Mammary tissue

**FRESH SAMPLES**

- Lung
- Liver
- Kidney
- Spleen
- Intestines (ligated)
- Lymph nodes
- Heart muscle
- Skeletal muscle
- Feces/colon contents
- Aqueous humor
- Rumen contents
- Heart blood (serology!)
- Urine
- Brain

**SAMPLE COLLECTION: HISTOPATHOLOGY**

- Collect tissues ≤ 1 cm thick for histos
- 1:10 tissue to formalin ratio
- Leak-proof, non-breakable jar with wide mouth

**SAMPLE COLLECTION: FRESH SAMPLES**

- Fresh tissue set in individual containers, labeled
- Freeze until shipment
SAMPLE COLLECTION: CULTURE (2 METHODS)

1. Swab in Amies with or without charcoal or ATM; sear, stab, swab solid organ
   - Chill
2. Piece of tissue
   - Chill or Freeze

AEROBIC CULTURE

SEAR/STAB/SWAB TECHNIQUE FOR SOLID ORGAN CULTURE
ANAEROBIC CULTURE

1. Swab in ATM; ear, stab, swab solid organ
   - Room temperature
2. 3 cm cubed piece of tissue
   - Freeze
3. 8” tied off loop of intestine
   - Freeze, or swab in ATM

SAMPLING INTESTINE FOR ANAEROBIC CULTURE

NECROPSY

- Left lateral
- Reflect right limbs
- Cut from subcutaneous tissues
- Reflect skin, and partially reflect mammary gland

16

17

18
NECROPSY

ENTERING THE THORAX

Cut junction of ribs and sternum

Cut along diaphragm

Remove entire rib plate; becomes your work surface for sample processing
Visual inspection: Tricavitary view

Pull up pericardial sac and incise

Exposure surface of heart

Palpate surface of heart

Pull up pericardial sac and incise

REFLECT OMENTUM
VESICLES OR EROSIONS?? STOP!

TONGUE

ESOPHAGUS
RESPIRATORY WORK-UP: BACTERIAL

Samples
- Lung
- Lymph node, spleen, kidney
- Sepsis

Differentials
- Mannheimia haemolytica
- Pasteurella multocida
- Histophilus somni
- Trueperella pyogenes
- Bibersteinia trehalosi
- Mycoplasma spp.
- Salmonella Dublin sepsis (neonate)

Tests
- Aerobic culture
- Mycoplasma culture

RESPIRATORY WORK-UP: OTHER

Samples
- Lung
- Intestine, spleen, lymph node

Differentials
- BVD
- BRSV
- BHV-1
- Coronavirus
- PI3

Tests
- PCR or ff for each year for BVD, intestine, spleen, or lymph node preferred

Additional Tests
- Fecal float
- Liver
- Selenium deficiency
- Selenium

THE HEART

- Right ventricular free wall thickness
- Left ventricular free wall thickness
- Ratio L to R should be approximately 3:1

34 35 36
Fix: Cardiac T
detail due to any additional lesion.

LIVER

SPLEEN
### Sudden Death Work-Up

<table>
<thead>
<tr>
<th>Samples</th>
<th>Differentials</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skeletal muscle (≥ 2 cm cubed)</td>
<td>Clavicular</td>
<td>Anaerobic culture</td>
</tr>
<tr>
<td>Colon contents</td>
<td>Intestinal gas</td>
<td>Histologic (Clostridial differentiation, C. chauvoei, novii, septicum, and sordellii)</td>
</tr>
<tr>
<td>Mammary gland</td>
<td>Testosterone</td>
<td>Aerobic culture</td>
</tr>
<tr>
<td>Lymph node, spleen, kidney</td>
<td></td>
<td>Aerobic culture</td>
</tr>
<tr>
<td>Aqueous humour, urine, rumen contents, fresh and fixed tissues</td>
<td></td>
<td>Appropriate testing based on gross and histologic findings</td>
</tr>
</tbody>
</table>

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### Head Removal

**Image**: Sample of a dissected head. The images show various structures, including bones and tissues, indicating the process of head removal and examination. The text next to the images suggests the importance of careful dissection and analysis in veterinary medicine.

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**Image**: Another page from the same document, showing more detailed images and text related to head removal, possibly focusing on specific tissues or organs that are critical for diagnostic work-up in sudden death cases.
AQUEOUS HUMOUR

- DO NOT send an entire eyeball fresh!
- Use 18-20 gauge 1” needle
- Pull off ASAP after death
- Red top tube
- Refrigerate for:
  - Nitrates
  - Magnesium
### SAMPLING THE BRAIN: RABIES

- Brain sample, cerebellum, and brain stem, placed in formalin.
- Other samples include cerebellum and cerebrum sections for other tests.
- Remaining brain to be placed in formalin.

### OTHER IMPORTANT BRAIN SAMPLES

- Cerebellum and cerebrum sections for other tests.
- Obex for BSE.

### NEUROLOGIC DISEASE WORK-UP

<table>
<thead>
<tr>
<th>Samples</th>
<th>Differential</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain sample, cerebellum</td>
<td>Rabies</td>
<td>Rabies-virus ELISA</td>
</tr>
<tr>
<td>Brain, cerebrum</td>
<td>Listeria</td>
<td>Listeria culture</td>
</tr>
<tr>
<td>Brain, cerebellum</td>
<td>Other</td>
<td>Aerobic culture</td>
</tr>
<tr>
<td>Brain stem</td>
<td>Listeria</td>
<td>Aerobic culture</td>
</tr>
<tr>
<td>Brain, swabs of meninges</td>
<td>Other heavy</td>
<td>Salt toxicosis</td>
</tr>
<tr>
<td>Brain, swabs of meninges</td>
<td>Other bacterial meningitis/encephalitis</td>
<td>Salt toxicosis, lead toxicosis</td>
</tr>
<tr>
<td>Brain, swabs of meninges</td>
<td>Other bacterial meningitis/encephalitis</td>
<td>Salt toxicosis, lead toxicosis</td>
</tr>
<tr>
<td>Liver sample</td>
<td>Other heavy</td>
<td>Salt toxicosis</td>
</tr>
</tbody>
</table>

*Note: The diagnosis of polioencephalomalacia is based on histologic examination of the brain.*
SAMPLING THE GI TRACT

- Rumen (and contents)
- Reticulum (foreign objects/ magnet?)
- Omusum
- Abomasum (ulcers? Hemorrhage? Neoplasia?)
- Lymph nodes and lymphoid aggregates

TIED OFF LOOP OF BOWEL
**GASTROINTESTINAL DISEASE WORK-UP**

**Samples**
- Tied off loop of bowel with contents (frozen)
- Colon contents (NOT frozen)
- Colon contents or ileocecal junction

**Differentials**
- Salmonella spp.
- Clostridium perfringens
- Escherichia coli
- Coronavirus
- Rotavirus
- BVD
- Coccidiosis, Cryptosporidium spp.
- Johne’s disease
- **Differentials & tests depend on age of animal**

**Tests**
- Salmonella culture
- Anaerobic culture
- Enterotoxin ELISA on contents
- Salmonella and Rotavirus FIA or PCR
- E. coli genotyping PCR
- Coronavirus, Rotavirus FA or PCR
- Fecal float
- Johne’s culture or PCR

**GASTROINTESTINAL DISEASE WORK-UP: SEPSIS**

**Samples**
- Spleen, kidney, lymph node

**Differentials**
- Sepsis secondary to GI disease
- **Sepsis**
- **Secondary to GI disease**

**Tests**
- Aerobic culture
### Abortion Work-Up

<table>
<thead>
<tr>
<th>Fetal Samples</th>
<th>Differentials</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placenta, lung, alveolar contents</td>
<td>Bacterial abortion (likely included)</td>
<td>Aerobic cultures on each</td>
</tr>
<tr>
<td>Lung</td>
<td>RVFV</td>
<td>BVD PCR</td>
</tr>
<tr>
<td>Renal (or liver)</td>
<td>Campylobacter fetus</td>
<td>Campylobacter fetus PCR</td>
</tr>
<tr>
<td>Renal/urinary bladder</td>
<td>Campylobacter fetus</td>
<td>Campylobacter fetus PCR on each</td>
</tr>
<tr>
<td>Fetal heart, liver, placenta (centers, pericardial effusion)</td>
<td>AFB</td>
<td>EVD PCR (embryos)</td>
</tr>
<tr>
<td>Placenta</td>
<td>Neospora</td>
<td>Neospora (IFA antibody)</td>
</tr>
</tbody>
</table>

Collect a full set of fixed tissues for histology; fetal brain, heart and placenta important for dx of Neospora

### Submitting Samples to a Lab

- History
- Lesion severity
- Distribution
- Chronicity
- Anatomic location
- Suspected disease process
- Photos
- Label all specimens—tissues, sites swabbed, etc.

### Shipping Samples

- Triple layer packaging (at minimum) is key!
- Must be leak-proof
- Absorbent material
- Rigid/durable
WHEN ASKED BY SHIPPING ATTENDANT: “WHAT’S IN THE BOX?”

- DON’T SAY: Dead body, or calf’s body parts, etc...

- DO SAY: “Animal Specimens—Classified as Biological Substances Category B (UN3373)”
SHIPPING SAMPLES

- ATM or other samples that should NOT be chilled, place in their own air cargo rated bag (to avoid contact with ice pack)

What else should NOT be mailed:

- Blood culture bottles
- Slides (blood smears)
Shipping Samples

- Human blood samples, blood cups, stomach fluids
- Thawed bacterial (isolates)
- Tissues bagged individually
- Inactivated, sealed, labeled
- All bags placed in another sealed bag
- All of these get placed in a single large air cargo rated bag

The air cargo rated bag is placed in an insulated pouch with frozen packs.

The formalin jars get bagged with absorbent material; placed in a box.
BOVINE NECROPSY VIDEO

- Cornell CVM, narrated live action (Drs. Brad Njaa, Belinda Thompson)
- https://www.youtube.com/playlist?list=PLzf8tGKj10zxT-YTqLfHpDM7a6WxCkM7m

Questions?
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