Animal Sampling

Steps for an easy and fast necropsy and tissue collection (that will also give you some relevant information)

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Tell me what you want and I will tell you what you need...

• Historical infectious disease?
  – Serum and some times spleen (looking for antibodies)
  – Fresh or frozen

• Present infectious disease?
  – Whole blood (With EDTA)(Looking for the pathogen)
  – Fresh or frozen
  – Fresh tissue of blood for cultures

• Cause of death
  – Fresh carcass
  – Many fresh, fixed and frozen tissues
  – Blood
  – Stomach contents

• Quantity and quality of samples is availability and guesswork dependent
Tell me what you found dead and I’ll tell you how to submit it...

• Amphibians are very sensitive, and best served whole and fresh
  – But formalin fixed works too (no cultures)
  – Frozen

• Reptiles also best whole and fresh
  – Formalin 10:1 tissue
  – Make sure Formalin can penetrate adequately

• Birds whole and fresh
  – Bag digestive tract separately
  – Fix lesions
  – Remove heart and bag separately (blood clot)
This animal is still alive!

- Necropsy may not the indicated method to retrieve samples yet...

“I’m not sure what’s wrong with you. We’ll have to wait for the results to come back from the autopsy.”
Sampling live animals

- Work within animal welfare guidelines
- No reaction does not mean no pain or fear
- Know the chemicals you are working with
- Prioritize samples
- You can take 1.25% body weight of blood safely
  - 100g rat = 1.25ml blood
  - 50 kg (110 lbs) bear = 625 ml blood
  = 330 ml
Samples to take from live animals

- Whole blood (with anticoagulant) first
- Whole blood for serum, with new needle
- Genetic samples (hair, biopsy, teeth, blood, etc.)
- Fecal samples
- Swabs (oral, cloacal), may need specific growth mediums
- Refrigerate ASAP
Why do necropsies?

- The animal is dead?
- Mortality event
- Legal issue
- Surveillance
- Baselines
- Learn
- It looks like a vehicle collision, let me put my microscope goggles on!
- Other?
Ethical work

• Work within approved standards
  – Also for euthanasia
• Work within your highest standards

• Obtain as much information as possible

• Know where to dispose of tissues and carcass
History?

- How did it die?
- When?
- Time of year?
- Physiological status?
- Everything helps!
External observation

- Coat (Quality, parasites, etc.)
- Deformities
- Soft spots
- Eyes
- Mouth
- Ears
- Extremities
Know the normal anatomy (or learn it right before)

- Have reference materials if you are not sure
- Take pictures
- Collect many tissues

- Know what you are collecting and what can be done with it!
Internal observation

- Have a method and stick with it!
- Observe organs “in situ”
- Obtain samples for culture before further examination
- Collect samples in appropriate mediums and containers
The Thoracic cavity

• Observe:
  • Color
  • Fluid collection
  • Abnormalities
  • Parasites

• Remove Trachea and Lungs
• Obtain lung samples
• Check Trachea for lesions and parasites
The heart

- Observe fat deposits on pericardium
- Note fluid collection or adhesions
- Open pericardium and palpate heart walls
- Open Heart (remember YOUR method)
- Observe chambers, valves and orifices
- Note changes in color, texture or presence of parasites
- May need to collect blood clot
- Collect tissue samples
The abdominal cavity

- Observe the internal lining of the esophagus
- Ligate the cardias
- Remove the organs from the cavity to extend intestines
- Ligate Rectum before separating
- Open the whole length of intestines and stomach
- Observe cavity for free floating parasites and lesions
- Obtain samples
The abdominal cavity

- For liver and spleen
  - Observe capsule color and edges
  - Slice (like loaf of bread) to observe internal structure
  - Note differences in consistency, color or presence of parasites
- Observe pancreas consistency and color
- Take samples
The reproductive and urinary tract

- Observe irrigation and size
- Remove from cavity and open
- Open bladder and observe urine quality
- Observe inside of bladder
- Remove Kidneys and observe fat deposit
- Remove capsule
- Slice lengthwise to observe structure
Extremities

• Observe muscle and bone structure
• Observe nerves
• Note lymph nodes, dissect a couple
• Note claws, hoofs, etc.
The head

• Observe mouth and teeth structure
• Note shape and presence of lesions
• Open longitudinally
  – Or open top of cranial cavity to remove brain whole
• Note fluid quality
• Note presence of parasites
Necropsy bottom line

• Collect duplicates: fresh and fixed
• Always collect: lung, liver, spleen, brain, kidney, intestines
• Additionally, collect any other tissue that might have lesions (skin, adrenal, ovary, etc.)
Questions?