PennVet
Diagnostic Laboratories

HOW TO SUBMIT BIOPSY SPECIMENS

Shipping Samples:

- Shipping services that provide tracking numbers are recommended. We provide mailing containers at no charge, and the *USPS® Tracking / Delivery Confirmation™* service can be purchased in addition through United States Postal Service to track and confirm delivery. UPS and FedEx also provide tracking.
- Provide accurate and complete information about the number of containers and specimens per container on the submission form. Double check that the tissues in the containers match what is indicated on the submission form.
- Ensure all containers are tightly sealed to avoid formalin leaks.
- Do NOT submit biopsy samples and cytology slides in the same box; formalin vapors will adversely affect the cytology smears.

General Guidelines:

- A 10:1 ratio of formalin to tissue is best to achieve thorough and rapid fixation.
- Margins: Clearly indicate on the submission form if you have labeled margins with ink or suture (avoid placing the suture within the affected area) and the location (e.g. “caudal margin”) of the labeled margin. Specify on the submission form if you would like to have margins evaluated.

Guidelines for Specific Tissues:

Eyes: Submit whole; remove eyelids if not needed for the diagnosis.

Brains: Submit whole.

Hearts: Submit whole**.**

Spleens: If possible, submit whole. For spleens that are too large to submit whole, take multiple wedge samples which include the mass and adjacent normal tissue (the center of the masses often consists of only hemorrhage and necrosis). If the spleen is diffusely enlarged (no masses), submit several slices from different regions of the spleen.

Liver:

Indications for liver biopsies include:

- Persistent elevation of liver enzymes (ALT, AST, ALP, GGT) in the absence of another explanation (e.g. hyperthyroidism, hemolysis, muscle disease, drug induction, hyperadrenocorticism).
- Persistently elevated post-prandial and/or fasting bile acids when portosystemic vascular anomalies have been ruled out.
- Radiologic abnormalities (e.g. unexplained hepatomegaly or microhepatica, solitary hepatic masses, multiple liver nodules, diffuse ultrasonographic abnormalities such as hypo- or hypechogenicity or a "mottled" appearance). Note: fine needle aspiration cytology may be warranted prior to biopsy when diffuse disease is present.
- Lesions found during exploratory surgery (e.g. gross liver abnormalities, primary neoplasia at another site in the abdomen, intrahepatic or extrahepatic cholestasis, gall bladder mucocele, portal vascular anomalies)

Liver biopsies are contraindicated in poor anesthetic candidates and patients with significant coagulation abnormalities.

Preferred sampling for liver biopsies:

- Samples from different lobes if the liver is diffusely and uniformly affected.
- Samples of normal and abnormal areas if lesion is not diffuse and all samples should be labeled (as site in the liver and normal vs. abnormal).

- Small samples and Tru-cut and needle biopsy samples are easily fragmented in transport, especially if the liver is diseased, so these biopsy samples should be submitted either in small vials or mesh cassettes, without using plastic sponges, which tend to crush the samples.

Ultrasound-guided liver biopsies:

- Multiple samples from different lobes can usually be obtained in animals over 10 Kg. In smaller patients or patients with reduced liver size, sampling is usually limited to one window. In these patients, the biopsy needle can be inserted in different directions from the same window to sample different areas of the same lobe.
- Samples can be taken of abnormal and adjacent normal areas and labeled accordingly.
- The biopsy sample should be flushed off the biopsy needle with saline into a vial containing an adequate volume of formalin.
- Fragmented samples may be submitted for culture, or frozen for PCR or toxicology as needed; intact samples are submitted for histopathology.

Surgical liver biopsies:

- Diffuse/uniform liver lesions: Obtain at least two samples from different lobes; avoid sampling mainly from the periphery of a lobe. Samples may be divided for culture, frozen sections, PCR, or routine histopathology processing; snap frozen samples are needed for metabolic testing.
- Focal liver lesion(s): In general the affected lesion is submitted as part of a partial or completely resected lobe. Label location and margins on the submission form.
- Vascular abnormalities (e.g. portosystemic shunts): At least one wedge biopsy of the liver should be obtained as there can be variability of histopathologic findings from different lobes.
- Feline liver biopsies: consider submitting small intestinal biopsy samples because of the association between cholangitis and feline inflammatory bowel disease or to rule-out small cell lymphoma.

Cytological Aspirate or Imprint Biopsies:

- As with needle biopsies, multiple samples from different lobes representing both abnormal areas and adjacent normal tissue, labeled accordingly, are ideally obtained. Generally, 3-5 smear preps per site aspirated is adequate.
- Impression smears or roll preps can be prepared from biopsy material. The specimen to be imprinted can be skewered on a needle to avoid crush artifact associated with handling by forceps. Once biopsy specimens have been placed in formalin, they are rendered unacceptable for cytological smear preparation and toxicology testing.
- Slides should be air-dried and submitted unstained. Previously stained (Diff-Quik) smears are acceptable as an inferior alternative, although diagnostic insight is frequently diminished.
- Minimize artifact from peripheral blood contamination, ultrasound lubricant gel contamination, and cell disruption. Formalin exposure (liquid and/or fumes) will dramatically alter cellular staining, thus cytological smears should be prepared and shipped in a FORMALIN-FREE environment.

Toxicology:

- Contact the Toxicology Laboratory at 610-444-5800 ext. 6244 for specific guidelines for individual tests.
- 100 mg wet weight of liver = 1 good Tru-cut; should be sufficient for most metal analyses such as copper or iron.
- Liver can also be screened for pesticides, various human and veterinary drugs, vitamin E, and other substances, though a minimum of one gram of fresh tissue is required.
- Anticoagulant rodenticides can also be detected in liver, though because it is unlikely that liver biopsies would be performed on these patients, the better sample may be whole blood or serum.