

Mail-In Pathology Services

- **Surgical Biopsies**
- **Cytology**
- **Field Necropsies**

Summary:

Examination of biopsy specimens from all vertebrate animals is another way our team of specialized veterinary pathologists serves the veterinary community. We routinely evaluate tumors, skin conditions, endoscopic, tru-cut or intraoperative biopsies from all domestic and many wild and exotic species.

When circumstances limit the ability to take diagnostic biopsy specimens, submission of cytology preparations may be necessary. Interpretation of these specimens is greatly enhanced by proper handling (see below), and inclusion of a complete description of the lesion(s) and clinical history.

We encourage submission of fresh and fixed specimens obtained by veterinarians performing necropsies in the clinic or field for histopathology and ancillary testing. Note packaging instructions described below.

How to use our Mail-In Pathology services:

Fixation/Sample preparation for histology

- Specimens to be submitted for **histopathology** should be immersed in 10% neutral buffered formalin (NBF), at a ratio of 10:1 volume of fixative to tissue in a screw top or sealed container. Samples can also be placed in an appropriate volume of fixative overnight and then transferred to a smaller volume of fixative prior to shipping if needed.
- *Proper and prompt fixation is the most critical step in generating diagnostic specimens.*
- Poorly fixed tissues received by the lab are placed in 10% Neutral Buffered Formalin (NBF) for an additional day, which delays results, and these specimens often cannot be interpreted sufficiently for a definitive diagnosis.
- Recipe for 10% Neutral Buffered Formalin:
<http://www.ihcworld.com/protocols/histology/fixatives.htm>
- Specimens to be submitted for cytopathology only should be air-dried only; heat-fixation may destroy cellular features. Unstained specimens are preferred due to wide variations in clinic staining protocols. For best results, a minimum of two slides of unfixed, air-dried material should be submitted.
- If you are sending **cytology preparations**, **do not** ship in the same package as formalin-containing specimens; fumes from formalin will significantly degrade cytology preps. Of course, the requirement for liquid-proof containers, etc. is not needed with glass slides. However, do carefully package slides in rigid container along with sufficient padding.

Cytology Specimens

Fine needle aspirates or impression smears:

- There are many aspiration techniques which will result in good cytological preparations. In general, aspirated samples should be sprayed onto the center of a slide and gently smeared by pressing two slides together, creating a monolayer of cells for interpretation.
- For impression smears, the piece of tissue should be gently pressed or rolled across the slide to create a monolayer of cells.
- Specimens should be air-dried in front of a fan to reduce artifacts; heat-fixation may destroy cellular features. Unstained specimens are preferred due to wide variations in clinic staining protocols. For best results, a minimum of two slides of unfixed, air-dried material should be submitted.

Fluids:

- Effusions and aspirates submitted for fluid analysis should be submitted in both a purple top (EDTA preserved) and a red top tube (tube with no additive or preservative). EDTA will preserve cell morphology for cytological evaluation thus decreasing the number of artifactual and autolytic changes as well as provide an uncoagulated specimen for accurate cell counts. The red top specimen can be utilized for additional ancillary diagnostics such as bacterial cultures and chemistry assays which can aid in the diagnosis of disease on a case-by-case basis. Samples should be shipped on ice for best results per the packaging instructions below.
- At minimum one prepared slide of fluid should be submitted along with the fluid in samples that will be processed outside of an hour of sampling.

Urine:

- A minimum of 10 mL of urine should be collected in an airtight leak proof container with no additives or preservatives. The sample should be refrigerated until time of shipment and shipped on ice for best results per the packaging instructions below.

Field Necropsy cases

- A Field Necropsy is performed by the referring veterinarian and defined as a set of fresh or formalin fixed tissues or both, submitted from a **deceased** animal.
- - **Fixed tissues:**
 - Minimum set: **heart, lung, liver, kidney, spleen, gastrointestinal tract** (rumen, abomasum/stomach, 3 segments of small intestine, cecum, 2 colon)
 - **Brain** if signs warrant
 - **Lymph nodes** if enlarged
 - **Other tissues of concern** (e.g., thyroid, adrenal, pituitary, urinary bladder, reproductive tract, bone, skin, etc.)
 - **Fresh tissues:**
 - **Bacteriology:** samples for tissue culture and antimicrobial sensitivity testing. Please note if submitting swabs for bacterial culture, the swabs intended for viral agents have antimicrobials that can impact diagnostic value for bacterial culture. *Please use appropriate swabs for indicated testing.* At minimum, use standard Rayon (non-cotton) swabs with saline to prevent drying of the swab.
 - **Molecular Biology:** tissue samples or swabs for PCR analyses
 - **Toxicology:** standard set of tissues include the following: stomach contents, liver, kidney, brain, ocular fluid, muscle, fat. Consultation with our toxicologist prior to the field necropsy (if possible), may be beneficial to ensure proper samples are collected based on clinical history.
 - **Virology:** ear notch for BVD ELISA, fresh tissue for Virus Isolation (VI) or Fluorescent Antibody (FA), serum for Virus Neutralization(VN)
 - **Serology:** red top tube/serum for various serologic test offerings
 - Note: Fresh tissues can be **held at no charge**, and tests may be added later pending results of histopathology, if so desired.
 - Please refer to the UKVDL website for specific details regarding recommended tissue, testing schedule and turnaround time for offered tests.

Accession Form

- Filling out the accession form as completely as possible will significantly expedite administrative handling, processing, and interpretation of the submission.
- Describe **complete history**, including **signalment**, duration, location, clinical appearance of the lesion(s), anatomical location (i.e. mammary gland, distal limb, lung, etc.) and any other clinical signs of illness.
- Description of location and clinical presentation are essential for interpretation, particularly of skin diseases and cytologic preparations; cytologic examinations cannot be performed without this information.
- Include or note any **specific questions** you would like addressed by the pathologist.

Photographs

- Submission of color photographs of areas to be biopsied, or gross lesions observed during field necropsies, is strongly encouraged. The clinical appearance, location, and any changes in surrounding tissue can be extremely helpful in generating a definitive diagnosis, appropriate interpretation and relevant comments.

Pathology Packaging

- Containers should be **labeled** with owner's name, animal ID, and identification of the specimen (e.g., "Mass from hip").
- Containers must have a **wide opening**, as fixed tissues become inflexible and often cannot be removed intact from narrow-mouthed openings.
- **Fresh tissues** should be shipped on wet ice or ice packs (no dry ice).
- **U.S. Department of Transportation** has strict requirements for shipping biological specimens – see packaging and shipping instructions on website.
- See also: <https://www.fedex.com/en-us/shipping/how-to-ship-clinical-samples.html>
- If you send **cytology preparations**, **do not** ship in the same package as formalin-containing specimens; fumes from formalin will significantly degrade cytology preps. Obviously, the requirement for liquid-proof containers, etc. is not needed with glass slides. However, do carefully package slides in rigid containers with sufficient padding.