**STANDARDIZED NECROPSY REPORT FOR GREAT APES AND OTHER PRIMATES**

**\*\*this is a fillable form – if printing / hand writing please circle or highlight need information**

Pathology # Click to enter Necropsy Date Click to choose a date

Species Choose a species If other, then specify species Click to enter other species

Name Click to enter name ISIS/ID Click to enter ID SB#Click to enter SB#

Age/DOB Enter Age or DOB DOD Click to choose a date

Euthanized Yes? No? Post-mortem condition of carcass Choose an item.

Institution Click to enter Institution Name

Click to enter Street Address

Click to enter City, State Zip code

Contact Click to enter name Contact Email Click to enter email address

Prosector (if different from contact) Click to enter name and email

**Abstract of clinical history:**

Click here to enter text.

**Gross Diagnoses:**

Click here to enter diagnoses

**External examination:**

**Measurements:**

Body weight Click to enter (kg) Crown-rump length (sitting height) Click to enter (cm)

Chest circumference (level of nipples) Click to enter (cm)

Width across the back at level of axilla Click to enter (cm)

Abdominal circumference (level of umbilicus) Click to enter (cm)

Skin fold thickness at dorsum/ level of lower ribs Click to enter (cm)

Depth of abdominal fat Click to enter (cm) Depth of fat over throat sac Click to enter (cm)

*If not examined, please enter “NE” in description. Sections of all tissues should be saved in formalin but not all tissues need to be saved frozen or photographed. See “Tissue collection guide” at the end of the worksheets for recommended frozen tissue collection. Please check whether tissues were saved in formalin, frozen and whether a gross photo was taken of lesions.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Site** | **Description** | **Formalin** | **Frozen** | **Photo** |
| **Eyes**  (fix whole- do not incise) | Ocular discharge? |  |  |  |
| **Ears** |  |  |  |  |
| **Nose** | Nasal discharge? |  |  |  |
| **Mammary gland**  (incl nipples) |  |  |  |  |
| **Skin/Hair** |  |  |  |  |
| **Umbilicus**  (neonates only) |  |  |  |  |
| **External genitalia** |  |  |  |  |
| **Scent glands** |  |  |  |  |
| **Subcutis** | (note fat, edema, hemorrhage, parasites) |  |  |  |

**Head & Neck Region:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Site** | **Description** | **Formalin** | **Frozen** | **Photo** |
| **Oral Cavity**  (gingiva, lips, cheek) |  |  |  |  |
| **Dentition** |  |  |  |  |
| **Larynx/ Pharynx** |  |  |  |  |
| **Tongue** |  |  |  |  |
| **Tonsils** |  |  |  |  |
| **Laryngeal Air Sacs**  See appendix for air sac examination | Are they symmetrical yes no? Are there septa yes no? |  |  |  |
| **Salivary glands** |  |  |  |  |
| **Thyroids**  **Parathyroids** | Combined weight Click to enter (g) |  |  |  |
| **Lymph Nodes** (cervical) |  |  |  |  |
| **Esophagus** |  |  |  |  |

**Other Notes:**

**Thoracic Cavity:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Site** | **Description** | **Formalin** | **Frozen** | **Photo** |
| **Cavity** | Note effusions/hemorrhage: volume Click to enter (ml)  Pleural Adhesions yes no? Mediastinal adipose yes no? |  |  |  |
| **Thymus** | Weight Click to enter (g) Size Click to enter x Click to enter x Click to enter (cm) |  |  |  |
| **Pericardium** | Effusion yes no? Volume Click to enter (ml) Pericardial fat yes no? |  |  |  |
| **Great Vessels** |  |  |  |  |
| **Heart \***  (See appendix for requested photographs and measurements) | Weight Click to enter (g) Circumference at groove Click to enter (cm) |  |  | **\*** |
| **Trachea/Bronchi** |  |  |  |  |
| **Lungs** | Weight: Left Click to enter (g) Right Click to enter (g) |  |  |  |
| **Lymph Nodes** (tracheobronchial) |  |  |  |  |
| **Diaphragm** |  |  |  |  |

**Other Notes:**

**Abdominal Cavity:**

*For sections of gastrointestinal tract, remember to note contents*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Site** | **Description** | **Formalin** | **Frozen** | **Photo** |
| **Cavity** | Effusion yes no? Volume Click to enter (ml)  Adipose yes no? Amount: Click to enter  Adhesions yes no? If yes, severity: Click to enter |  |  |  |
| **Liver** | Weight Click to enter (g) |  |  |  |
| **Gall Bladder** |  |  |  |  |
| **Stomach** |  |  |  |  |
| **Duodenum** |  |  |  |  |
| **Pancreas** |  |  |  |  |
| **Jejunum** |  |  |  |  |
| **Ileum** |  |  |  |  |
| **Cecum/Appendix** |  |  |  |  |
| **Colon** |  |  |  |  |
| **Rectum** |  |  |  |  |
| **Lymph nodes**  (mesenteric) |  |  |  |  |
| **Spleen** |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Site** | **Description** | **Formalin** | **Frozen** | **Photo** |
| **Abdominal Aorta**  (open past bifurcation) |  |  |  |  |
| **Adrenals**  (weigh/measure L and R) | L Weight Click to enter (g) Size Click to enter x Click to enter x Click to enter (cm)  R Weight Click to enter (g) Size Click to enter x Click to enter x Click to enter (cm) |  |  |  |
| **Kidneys**  (weigh/measure L and R) | L Weight Click to enter (g) Size Click to enter x Click to enter x Click to enter (cm)  R Weight Click to enter (g) Size Click to enter x Click to enter x Click to enter (cm) |  |  |  |
| **Ureters** |  |  |  |  |
| **Urinary bladder** |  |  |  |  |
| **Gonads**  **(ovaries/testes)**  (weigh/measure L and R) | L Weight Click to enter (g) Size Click to enter x Click to enter x Click to enter (cm)  R Weight Click to enter (g) Size Click to enter x Click to enter x Click to enter (cm) |  |  |  |
| **Uterus / Cervix** |  |  |  |  |
| **Prostate / Penis / Seminal vesicles** |  |  |  |  |

**Other Notes:**

**CNS / Musculoskeletal/Other:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Site** | **Description** | **Formalin** | **Frozen** | **Photo** |
| **Skeletal Muscle** |  |  |  |  |
| **Joints** |  |  |  |  |
| **Spinal Column** |  |  |  |  |
| **Bone Marrow**  (femur or rib) |  |  |  |  |
| **Brain**  (describe also meninges) | Weight Click to enter (g) |  |  |  |
| **Pituitary** | Weight Click to enter (g) |  |  |  |
| **Trigeminal ganglia** |  |  |  |  |
| **Spinal cord** |  |  |  |  |
| **Peripheral nerve**  (brachial plexus & sciatic) |  |  |  |  |
| **Lymph Nodes** | Specify other submitted sites: Click to enter |  |  |  |

**Other Notes:**

**Cardiac Worksheet \*see GAHP Recommended Cardiac Necropsy Protocol for details:**

**Whole Heart Submission**

Photographs:

*In situ*  Heart base  4 Views: Anterior, Right, Posterior, Left

Measurements:

Heart weight Click to enter (g) Heart circumference Click to enter (cm)

Fixed in Formalin to Submit:

Entire heart

**Selected Section Submission**

Photographs:

*In situ*   4 Views: Anterior, Right, Posterior, Left

Heart base  3 (or 4 for gorillas) slab sections from apex

R AV valve  Pulmonic valve

L AV valve  Aortic valve

Measurements:

Heart weight Click to enter (g) Heart circumference Click to enter (cm)

R AV valve Click to enter (cm) Pulmonic valve Click to enter (cm)

L AV valve Click to enter (cm) Aortic valve Click to enter (cm)

Fixed in Formalin to Submit:

3 or 4 cm slab cross-section

R Atrium-Ventricle with R AV valve

Interventricular septum w/ aortic valve

L Atrium-Ventricle with L AV valve

Aorta

Conduction System (if submitting for detailed protocol)

**GUIDE TO THE NONHUMAN PRIMATE POST MORTEM EXAMINATION**

**TIPS FOR TISSUE COLLECTION DURING THE NECROPSY EXAMINATION**

**Collection of tissues**

Tissues to be fixed in 10% neutral buffered formalin should be less than 0.5 cm thick to (exception is brain, see below) allow for adequate penetration of formalin for fixation.

Initial fixation should be in a volume of fixative 10 times the volume of the tissues. Agitation of the tissues during the first 24 hrs is helpful to prevent pieces from sticking together and inhibiting fixation.

**Labeling of specimens**

If pieces are small or not readily recognizable (eg. individual lymph nodes) they can be fixed in cassettes or embedding bags or wrapped in tissue paper labeled with pencil or indelible ink. Another alternative is to submit lymph nodes with attached identifiable tissue, eg. axillary with brachial plexus, inguinal with skin, bronchial with bronchus, etc.

Sections from hollow viscera or skin can be stretched flat on paper (serosal side down) and allowed to adhere momentarily before being placed in formalin with the piece of paper. The paper can be labeled with the location from which the tissue came.

The formalin container should be labeled with the animals name or number, the age and sex, the date and location, and the name of the prosector.

**Tissues to be Frozen**

Archiving or biobanking is an important component of a thorough post mortem examination. Frozen tissues can provide a resource for pathogen discovery, toxicology, nutritional analysis, and genetic studies. Freezing at refrigerator freezer temperatures (about 00 F or – 18-20o C) is adequate for toxicology and most nutritional studies, while ultralow temperatures (about -80o C or colder) are better for genetic studies and pathogen discovery.

**Recommended tissues:**

Samples to be held at -20 C include 5-10 gm of liver, kidney, fat, stomach content, lower GI content.

Ssamples to be held at -80 C include 1-2 g lung, liver, kidney spleen, brain, and any specific lesions for which you can envision wanting pathogen discovery.

**Additional samples**

Swabs

Serum retrieved from chicken fat clots by centrifugation

**Containers for freezing:**

For -80 wrap small samples individually in foil and put together in a freezer safe baggie.

For -20 place tissues in individual freezer safe baggies such as WhirlPak.

Liquids can be frozen in freezer-safe cryotubes

**Tissues to be preserved (10% neutral buffered formalin)**

From the skin submit at least one piece without lesions, a nipple and mammary gland tissue, scent gland, and any lesions and subcutaneous or ectoparasites.

Axillary and or inguinal lymph nodes may be submitted whole from small animals and should be sectioned transversely through the hilus in large primates.

Mandibular, and/or parotid salivary glands should be sectioned to include lymph node with the former and ear canal with the latter.

Thyroids, if it is a small primate, may be left attached to the larynx and submitted with the base of tongue, pharynx, esophagus as a block. In larger primates, take sections transversely through the thyroids trying to incorporate the parathyroids in the section.

Trachea and esophagus and laryngeal air sac sections may be submitted as a block.

Cervical lymph nodes may be submitted whole if small or sectioned transversely.

Rib or femur can be used as a source of bone marrow. A marrow touch imprint may be made and air dried for marrow cytology.

Section of thymus or anterior pericardium should be taken perpendicular to the front of the heart.

Heart: See cardiac necropsy protocol for recommended measurements, photos and prosection guidelines.

Lungs: if possible inflate at least one lobe by instilling clean buffered formalin into the bronchus under slight pressure. Fix at least one lobe from each side and preferably samples from all lobes. In little animals the entire "pluck" may be fixed after perfusion.

Take sections of all levels of the GI tract including: gastric cardia, fundus and pylorus; duodenum at the level of the bile duct with pancreas attached; anterior, middle and distal jejunum; ileum; ileocecocolic junction with attached nodes; cecum and (in apes) appendix; ascending, transverse and descending colon. Open loops of bowel to allow exposure of the mucosa and allow serosa to adhere momentarily to a piece of paper before placing both bowel section and paper in formalin; or gently inject formalin into closed loops.

Liver: One section should include bile ducts and gall bladder and take sections from at least one other lobe.

Make sure sections of spleen are very thin if the spleen is congested; formalin does not penetrate as far in very bloody tissues.

Mesenteric (jejunal) nodes should be sectioned transversely; colonic nodes may be left with colon sections.

Take sections from each kidney: cut the left one longitudinally and the right one transversely so they will be identifiable.

Fix small adrenals whole and section larger ones (left -longitudinal and right transversely) making sure to use a very sharp knife or new scalpel blade so as not to squash these very soft glands.

Bladder sections should include fundus and trigone. Make sure to include round ligaments (umbilical arteries) in neonates.

Section the prostate with the urethra and seminal vesicles transversely. Section testes transversely.

In small females fix the vulva, vagina, cervix, uterus and ovaries as a block after making a longitudinal slit to allow penetration of formalin. Rectum and bladder (opened) can also be included in this block. In somewhat larger animals make a longitudinal section through the entire track. In large primates make transverse sections of each part of the track and the ovaries.

If gravid: weigh and measure placenta and fetus. Perform a post mortem examination of the fetus. Take sections of disc from periphery and center and from extraplacental fetal membranes. Take sections of major organs and tissues of fetus.

The brain should be fixed whole, or, if too large for containers, may be cut in half longitudinally (preferred) or transversely through the midbrain. It should be allowed to fix for at least a week before sectioning transversely (coronally) into 0.5-1.0 cm slabs to look for lesions. Submit the entire brain if possible and let the pathologist do the sectioning, otherwise submit slabs from medulla, pons and cerebellum, midbrain, thalamus and hypothalamus, prefrontal, frontal, parietal and occipital cortex including hippocampus and lateral ventricles with choroid plexus. In older apes it is especially important to examine prefrontal and frontal cortex and hippocampus for senile plaques and vascular changes.

*Instead, institutions may elect to send brains to the Great Ape Aging Project (separate protocol). This is a research project which does not perform diagnostic histopathology (as of Jan 2015). If histopathology is desired, the prosecting pathologist may need to modify diagnostic tissue handling/selection. Contact the Great Ape Aging Project PIs for more information.*

Fix the pituitary whole. Put pituitary in an embedding bag if it is small. Also remove and fix the Gasserian (trigeminal) ganglia.

Spinal cord - if clinical signs warrant, remove the cord intact and preserve it whole or in anatomic segments (eg. cervical, anterior thoracic etc.)

Take bone marrow by splitting or sawing across the femur, to get a cylinder and then make parallel longitudinal cuts to the marrow. Try to fix complete cross sections or hemi-sections of the marrow.

Take sections of any and all lesions, putting them in embedding bags if they need special labeling.

Remember, it's better to save "too many" tissues than to risk missing essential lesions or details.

This represents a lot of work on the part of the prosector, often under less than comfortable conditions. But the effort expended at the time of the gross post mortem is much appreciated by the histopathologist, and is crucial to our investigations of the causes of morbidity and mortality of free-living nonhuman primate

**THANK YOU !!!!!**

**WORKSHEET**

**GREAT APE TAG PLACENTAL EXAMINATION**

Dam name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Stud book #\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Infant/fetus weight \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_gm, Infant crown-rump length\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cm Sex: M F U

Status of infant (circle all that apply): term, preterm, alive healthy, alive weak or ill, dead, singleton, twin, vaginal birth, C-section, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PLEASE INSERT PHOTOGRAPHS OF BOTH SIDES OF THE PLACENTA WITH ATTACHED CORD AND MEMBRANESDESCRIPTIONS AND MORPHOMETRICS OF THE PLACENTA AND CORD

PLACENTA (Circle all that apply): complete, partial, disc, membranes, cord, fresh, desiccated, clean, contaminated, meconium, hemorrhage.

Describe other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Umbilical cord:

Cord length\_\_\_\_\_\_\_\_\_\_\_\_cm, Cord diameter\_\_\_\_\_\_\_\_\_\_\_\_cm, Twists: N= \_\_\_\_\_\_\_\_\_\_\_\_\_

Cord cut surface: number of arteries\_\_\_\_\_\_vein(s)\_\_\_\_\_\_\_\_\_\_\_ other structures?\_\_\_\_\_\_\_\_\_\_\_\_, Warthin’s jelly\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Desication?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cord color (white, tan, brown, green, red. Other\_\_\_\_\_\_\_\_\_\_\_\_),

Lesions: hematomas, exudate, edema, knots (N=\_\_\_\_\_\_\_\_), other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cord insertion: central, marginal, on disc, within membranes

Fetal membranes

Insertion; percent\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ location: marginal, circumvallate, circummarginal

Color\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Exudates?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Hemorrhage?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Trimmed placental weight (minus membranes and cord)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gm

Placental disc greatest diameter\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cm x thickness\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cm

Fetal surface (photograph): WNL, smooth, rough, vessels, thrombi, hemorrhage, percent surface affected \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Maternal surface (photograph): WNL, complete, disrupted, excessively nodular or masses, hematomas, pallor, fibrin, percent surface affected \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parenchyma cut surface: normal (= meaty, spongy, red); lesions: marginal, central, dark, pallor, exudative, percent disc affected\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

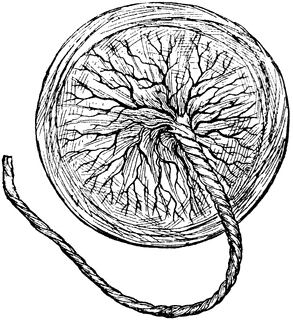
Samples taken:

Histology/formalin – location and number of samples

Culture: (bacterial, fungal viral)

Frozen (refrigerator freezer, ultralow freezer, Liquid nitrogen, dry ice)

Adapted from: [http://www.uptodate.com/contents/gross-examination-of-the-placenta#](http://www.uptodate.com/contents/gross-examination-of-the-placenta)



usf.edu/clipart/26100/26112/placenta\_26112.htm

You may use this diagram to note extent and location of lesions

WORKSHEET

GREAT APE TAG FETUS/NEONATE/INFANT POSTMORTEM EXAMINATION

Identification number or name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Stud Book #\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Age \_\_\_\_\_\_\_\_\_\_\_ days. Weight \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_gm. Crown-rump length \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cm.

Placenta available? Yes No , eaten by dam, eaten by other group members, fate unknown, other?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Post mortem condition (fresh, mild, moderate or severe autolysis)

Post mortem interval (death to examination):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hours, days

Other body measurements: head circumference \_\_\_\_\_\_\_\_\_\_\_\_\_\_cm, thoracic circumference \_\_\_\_\_\_\_cm, abdominal circumference \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cm

**EXTERNAL EXAMINATION (circle all that apply or describe)**

Nutritional status: emaciated, thin, adequate, abundant fat, other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Muscle development: hypoplastic or atrophic, well-muscled, pink, dark red

Umbilicus: Fresh desiccated, color\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(stump length \_\_\_\_\_\_\_\_\_cm),

Hair coat: naked, sparse, luxuriant, head only, epilates easily, other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Skin: hemorrhage, other discoloration, lacerations, maceration, other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, location of lesions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Peripheral lymph nodes: indicate nodes examined and any abnormalities \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Oral cavity:**

Dentition: erupted teeth \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, enamel (pigmented, pitted, linear erosions, on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ teeth,

Palate: intact, cleft (photo or describe \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

Tongue: pigmented, coated, erosions, plaques, ulcerations, other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lips and buccal surfaces: NSL, lacerations, hemorrhage, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

EYES: NSL, micro-ophthalmia, cornea cloudy, lens opaque, hemorrhage, other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

EARS: pinna: hemorrhage, lacerations, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Neck region:**

Thyroid(s): flat, visible follicles, nodular, red, amber, tan, parathyroids visible? Yes  No

Retropharyngeal and mandibular lymph nodes: small, enlarged, other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Esophagus: empty, full, dilated, thickened, erosions, ulcerations, plaques, other

**Internal examination:**

Viscera position (photo viscera in situ): normal, situs inversus, individual organs displaced\_\_\_\_\_\_\_\_\_\_\_\_

Thorax: negative pressure? Yes No. Effusion? none, clear, serosanguinous, blood, pus, fibrin, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ amount \_\_\_\_\_\_\_\_\_\_\_\_\_ cc

THYMUS: mediastinal only, mediastinal and cervical, size: \_\_\_\_\_cm x\_\_\_\_cm x \_\_\_\_cm; \_\_\_\_\_\_\_\_\_\_gm

HEART: Pericardial effusion?  Yes  No , character\_\_\_\_\_\_\_\_\_\_\_, epicardial fat: none, little, moderate, abundant, moderate, little, serous atrophy; epicardial fibrosis? Yes  No. Please photo (all 4 sides if possible).

DUCTUS ARTERIOSUS: open, probe patent, closed, length \_\_\_\_\_\_\_\_\_\_cm

Mid-Ventricular transverse section \_\_\_\_\_\_\_\_\_\_\_ cm from apex: right ventricular free wall \_\_\_\_\_\_\_\_\_\_\_\_\_cm, left ventricular free wall \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cm, septum \_\_\_\_\_\_\_\_\_\_\_\_cm;

Open along lines of flow: Foramen ovale ( closed, open, probe patent, dye patent)

Myocardium: NSL, pale streaking, masses, other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Right AV valve circumference \_\_\_\_\_\_\_\_\_\_\_cm, Left AV valve circumference\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm, pulmonic valve circumference \_\_\_\_\_\_\_\_\_\_\_\_cm, aortic valve circumference \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cm

Valves (RtAV): normal number of leaflets, abnormal number leaflets (photo or describe), smooth nodules, rough nodules, adherent thrombi? Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

LAV valve: normal number of leaflets, abnormal number of leaflets (photo or describe), smooth nodules, rough nodules, adherent thrombi? Other:

Pulmonic valve: normal number of leaflets, abnormal number of leaflets (photo or describe), smooth nodules, rough nodules, adherent thrombi? Other:

Aortic valve: normal number of leaflets, abnormal number of leaflets (Photo or describe), smooth nodules, rough nodules, adherent thrombi? Other:

Coronary ostia: number and location (photo if possible):

LUNGS:

Color: light pink, red, purple, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; Atelectasis: none, partial, diffuse) weight left\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_gm, right \_\_\_\_\_\_\_\_\_\_\_\_\_gm,

Lobation left N= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, right N= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cut surface: aerated, dry, oozes fluid: clear, foamy, tan, pink, red, other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Trachea and Bronchi: clear, foam, thin fluid, bloody fluid, mucus, pus

Hilar (tracheobronchial) lymph nodes; small, enlarged, cut surface: dry, oozes lymph, exudate?

Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ABDOMINAL CAVITY: Effusions? Yes  No. Type: clear, serosanguinous, blood, pus, fibrin.

Adhesions Yes, No. Character: fibrinous, fibrous, easily broken down, firm, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Diaphragm: intact, hernia, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Omental and mesenteric fat: none, sparse, moderate, abundant. Color: white, off white, yellow, orange

LIVER: extends beyond sternum?  Yes No \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cm); Weight \_\_\_\_\_\_\_\_\_\_\_gm

Color (tan, brown, red-brown, dark red/purple, green tinged, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_),

Gall bladder: empty, full, opaque, translucent. Bile: yellow, green, brown, red, watery, chunks or flakes. Other?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Umbilical vein/falciform ligament: NSL, thickened, rough surface, discolored, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SPLEEN: Size \_\_\_\_\_\_\_\_\_cm x \_\_\_\_\_\_\_\_\_cm x \_\_\_\_\_\_\_\_\_\_\_\_\_\_cm. Weight:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_gm;

Color: pale, dark red, purple, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cut surface (dry, oozes blood, exudate, nodules, visible white pulp), Other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

KIDNEYS:

Left kidney \_\_\_\_\_\_\_\_\_\_\_\_cm x\_\_\_\_\_\_\_\_\_\_cm x\_\_\_\_\_\_\_\_\_\_\_cm. Weight \_\_\_\_\_\_\_\_\_\_\_\_gm

Right kidney \_\_\_\_\_\_\_\_\_\_\_cm x \_\_\_\_\_\_\_\_\_\_\_\_cm x \_\_\_\_\_\_\_\_\_\_cm. Weight \_\_\_\_\_\_\_\_\_\_\_\_\_gm

Capsules: smooth, pitted, undulating, other\_\_\_\_\_\_\_\_\_\_\_\_; capsule peels easily, with difficulty, other, Cut surface: pale streaks (fibrosis), wedge shaped foci pale or red (infarcts), exudates, Other \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ADRENALS: Left \_\_\_\_\_\_cm x \_\_\_\_\_\_\_\_\_\_cm x \_\_\_\_\_\_\_\_\_\_cm Weight\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Right \_\_\_\_\_\_\_cm x \_\_\_\_\_\_\_\_\_cm X\_\_\_\_\_\_\_\_cm. Weight\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cortex\_\_\_\_\_\_\_\_\_\_\_\_\_\_, medulla\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lesions?

BLADDER: empty, full \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cc, color: clear, yellow, red, opaque, granular, other \_\_\_\_\_\_\_\_\_\_, Round ligaments (umbilical arteries) (NSL, hemorrhage, fibrin, exudates)

STOMACH: empty, full, distended. Content: water, mucus, curdled milk, other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Mucosa: NSL, multifocal erosison, red or black spots, ulceration, discoloration, describe or other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DUODENUM: content: empty, scant, abundant, mucus, curdled milk, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Mucosa: Tan, green, brown, red, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PANCREAS: Size: NSL, abundant, scant, Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Color/appearance: cream-colored, tan, brown, hemorrhagic, edematous, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

JEJUNUM: content: empty, scant, abundant, mucus, color of content \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Color of content and mucosa: tan, green, brown, red, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ILEUM: content: empty, scant, abundant, mucus, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Color of content and mucosa: tan, green, brown, red, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

CECUM: content: empty, scant, abundant, mucus, feces, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Color of content and mucosa: tan, green, brown, red, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

APPENDIX: \_\_\_\_\_\_\_\_\_\_\_\_\_ cm long x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cm diameter. Content: empty, scant, abundant, mucus, feces, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Color of content and mucosa: tan, green, brown, red, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

COLON: empty, scant, abundant, mucus, feces, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Color of content and mucosa: tan, green, brown, red, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

RECTUM: Content: empty, distended, liquid feces, pasty feces, formed normal feces, hard dry feces

Color of content and mucosa: tan, green, brown, red, other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

MESENTERIC, ILEOCECAL and COLONIC LYMPH NODES: small, enlarged, cut surface edematous, bulging cortex, Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PERIAORTIC and INTERNAL ILIAC LYMPH NODES:

SKULL: sutures (open, closed) PHOTO; Anterior Fontanelle closed, open \_cm x \_\_cm; posterior fontanelle closed, open \_\_\_\_\_\_\_\_cm x \_\_\_cm. (Photo if possible)

BRAIN: meninges (wet, dry, congestion, edema, exudates, hemorrhage, other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

Weight \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_gm

SPINE:

Spinal column: NSL, spinal bifida, scoliosis, kyphosis, other defects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Spinal cord: not examined, NSL, hemorrhage, exudates other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

APPENDICULAR SKELETON:

Growth plates and costochrondral junctions: NSL, wide, flared, inflamed, other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ration of cortices to medullary cavity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ANCILLARY DIAGNOSTICS:

Cultures \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tissues frozen \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cytogenetics \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PLEASE SUMMARIZE YOUR IMPRESSION OF THIS CASE:

**POST MORTEM EXAMINATION OF THE AIR SACS OF APES**

*Information on air sac anatomy is especially important for bonobos, chimpanzees and orangutans as there are no definitive papers on their air sac anatomy*

Examine the skin over the air sac for signs of fistulae or scars. Note thickness of the skin and presence/amount of fat.

Incise the air sac through the skin on the anterior (ventral) aspect.

Note color and texture of air sac lining.

Note presence of absence of exudates, and character of exudate.

Note presence or absence of compartmentalization by connective tissue.

Note extent of air sacs (e.g. under clavical, into axilla, etc.)

Is there a central compartment?

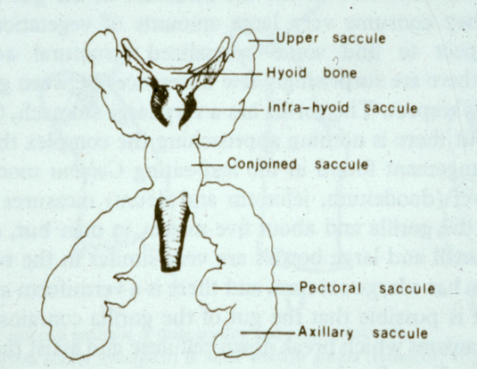
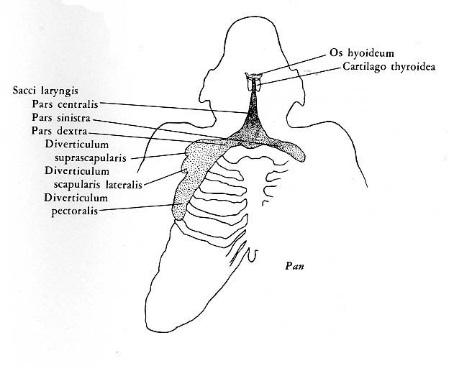
Are the lateral sacs symmetrical (they may vary in size in chimpanzees and bonobos)

Identify and describe the opening(s) from the larynx into the air sac (e.g. single slit-like opening or paired oval openings). Are the openings parallel or perpendicular to the long axis of the larynx and trachea. Note any exudate within the ostia

Note the location, size and shape of the opening in the larynx (e.g. from lateral saccules or centrally at the base of the epiglottis).

**Cultures:**  Please culture several different sites within the air sacs (we need data to determine if infections are "homogeneous" or compartmentalized).

Diagrams of air sacs to aid in measurements and descriptions.

Gorilla air sacs (From Dixon) Chimpanzee air sacs (From Swindler & Wood)