

Veterinary Service  
VETERINARY NECROPSY PROTOCOL  
FOR MILITARY WORKING DOGS

This regulation explains how to perform and report a necropsy as required by Air Force and Army directives. The necropsy has a dual function: it provides additional information concerning the existence of any disease process that occurred during the animal's life, and it helps establish the immediate cause of death. By using this knowledge to safeguard the health of these dogs, the veterinarian contributes significantly to the effectiveness of the Military Working Dog Program. This regulation applies to all veterinarians.

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## SECTION A-VETERINARY NECROPSY PROTOCOL

### 1. Scope of Information:

a. This regulation provides veterinary officers of the Air Force and Army (also contract civilian veterinarians) with concise information on the collection and fixation of organs and tissues for microscopic examination. It also tells them how to properly ship specimens, and gives specific technical suggestions on necropsy procedures for military working dogs. It is important that all necropsies be completely and skillfully performed, with the ultimate objective to record all pertinent information. The postmortem examination should not be restricted to those areas with obvious lesions, but should include all vital organs of the body. The normality of certain viscera is often as significant as the disease of others, and organs that appear normal macroscopically are frequently abnormal microscopically.

b. Thorough preparation of reports, careful collection of tissues for microscopic study, and the proper disposition of records and materials for future use, greatly increase the value of the necropsy. The information gained from scientific studies of this material contribute to the overall improvement of the medical care and the total effectiveness of the military working dog to the Armed Forces.

### 2. Pathological Specimens To Be Sent Directly to the Armed Forces Institute of Pathology (AFIP).

The AFIP is responsible for diagnostic and consultative services for the Air Force and Army Military Working Dog Program (AFR 160-55, The Armed Forces Institute of Pathology) (AR 40-31). The contributing veterinary officer forwards a complete report with the selected pathological specimens obtained both surgically and at necropsy to: The Director, Armed Forces Institute of Pathology, Wash DC 20306. Methods of collection and fixation of material for microscopic examination are outlined in section B.

### 3. DD Form 1626, Veterinary Necropsy Report.

A necropsy examination will be performed when a military working dog dies or is euthanatized. This is not required for untrained dogs euthanatized for non-medical reasons at a Procurement Training Center, (AR 40-905) (AFR 125-9, USAF Military Working Dog Program and AFR 163-11, Veterinary Services USAF). A necropsy is not complete until a detailed record is made and properly filed. In preparing DD Form 1626, the veterinarian should strive to produce a clear and complete word picture of all findings. One copy of the completed necropsy report is forwarded to the AFIP with the tissues for microscopic examination. A second copy is placed in the military working dog's health record and for-

warded to the Central Repository for Military Working Dog Records, Lackland AFB TX 78236.

a. The description should be as objective as possible; pathologic diagnoses should be avoided in the text of the report so the report has meaning for anyone who may later review it. For example, instead of recording: "The right kidney shows chronic inflammation," express it as follows: "The right kidney is small, weighing 40 grams. The capsule is white, roughened, and tightly adherent. The parenchyma cuts with increased resistance, and gray radial streaks about 3mm wide are present in the medulla, etc." If the organ is grossly normal, the phrase "no gross lesions recognized" or "NGLR" may be used.

b. Include the size, weight, shape, color, consistency, and general description of capsule and cut surfaces of organs with lesions. All departures from normal position and relationship should be listed. All lesions recognized should be fully and carefully described.

c. All organs and lesions in the body should be examined and representative sections of each selected for future histologic studies. It is particularly important that specimens be taken from each organ (including muscle, bone, marrow) regardless of the presence of gross lesions.

d. Before euthanasia, blood and urine should be collected and clinical tests and examinations performed. These should include but are not limited to:

- (1) Total WBC.
- (2) Differential WBC.
- (3) Packed cell volume.
- (4) Hemoglobin.
- (5) Blood urea nitrogen.
- (6) Total serum protein.
- (7) Albumin/globulin ratio or total albumin.
- (8) Serum transaminases (SGOT and SGPT).
- (9) Alkaline phosphatase.
- (10) Urine-specific gravity.
- (11) Urine-creatinine.
- (12) Urine-protein.
- (13) Urine-sugar.
- (14) Urine-microscopic examination.

Record the results of these tests on DD Form 1626.

e. For guidance, see attachment 1, DD Form 1626, Veterinary Necropsy Report: Checklist and Example.

## SECTION B-PROCEDURES FOR COLLECTING, FIXING, AND SHIPPING MATERIAL FOR MICROSCOPIC EXAMINATION

**4. Obtaining Specimens.** A postmortem examination is not complete without a histologic examination of all tissues. To be of maximum value, tissues

must be carefully collected and properly fixed. Figure 1 contains a list of special reminders to aid in this examination.

a. After checking and collecting skin, the superficial lymph nodes and any cutaneous tumors, open the abdominal and thoracic cavities. Start with the tongue and remove all the viscera as a block of organs to, and including, the anus. Samples of the following pathologically important organs **and tissues are** submitted for histologic evaluation to the AFIP:

- (1) Skin, cutaneous tumors, prescapular and inguinal lymph nodes.
- (2) Tongue.
- (3) Tonsils.
- (4) Salivary gland and mandibular lymph node.
- (5) Trachea.
- (6) Lungs and hilar lymph nodes.
- (7) Esophagus.
- (8) Stomach.
- (9) Small intestine and pancreas.
- (10) Large intestine.
- (11) Mesenteric lymph node.
- (12) Heart and aorta.
- (13) Liver and gallbladder.
- (14) Kidneys.
- (15) Urinary Bladder.
- (16) Spleen.
- (17) Testicles, and prostate, or vagina, uterus, and ovaries.
- (18) Adrenal glands.
- (19) Thyroid and parathyroid glands.
- (20) Brain, pituitary gland, and 2-3 segments of cervical spinal cord.
- (21) Eyes.
- (22) Sternum or costochondral junction.
- (23) Hip joints (paragraph 71).

(24) Bone marrow smears (paragraph 71) (two samples) stained with Wright's, Wright-Giemsa, Giemsa, or Wright-Leishman.

(25) Stained peripheral blood smears (two samples).

(26) Any other organs and tissue with lesions including regional lymph nodes and bone (paragraph 6e).

b. Here are a few helpful hints when making cuts to obtain specimens for microscopic examination:

(1) The knives and scissors must be clean and sharp.

(2) The cuts must be made quickly and accurately.

(3) The specimens should be large enough for the pathologist to readily identify tissues grossly and representative sections for processing. Proper fixation depends exclusively on the thickness of the sections, not the length or width. Organ and tissue sections should be no thicker than 0.5 cm.

**5. Preparation of Wet Tissue.** Fixation is the process of killing and hardening (preserving) tissue. Tissue should be placed in the fixative immediately upon removal from the body to preserve the relations of tissue elements as they were in life. The choice of fixative agents, should be determined by the method of staining or preserving the tissue. The most commonly used fixative is formalin which has certain advantages for routine purposes. It fixes and hardens tissue quickly, permits a variety of staining methods, is inexpensive, simply prepared, and readily available.

a. Place all tissues selected for histologic examination in 10 percent buffered formalin, 10 times

1. Do-prepare two copies of DD Form 1626, Veterinary Necropsy Report. Forward one copy to AFIP with tissue specimens and enclose one in the Military Working Dog Permanent Health Record.
2. Do—take tissue sections of all lesions or suspected lesions.
3. Do-cut large (0.5 cm thick) representative pieces of all organs and tissues for histopathologic evaluation.
4. Do-use buffered formalin fixative, if possible.
5. Do-use a ratio of 10 times the volume of fixative to the volume of tissue for initial 48 hours preservation.
6. Do-use large-mouth containers for fixing and storing tissue.
7. Do-fix tissue a minimum of 48 hours before packing for shipment.
8. Do-use fresh formalin when packaging for shipment.
9. Do-remove and fix eyes immediately after euthanasia.
10. Do-take blood and urine at euthanasia for local clinical laboratory examinations.
11. Do-list results of all special tests and examinations, that is, CBC, BUN, bacterial cultures, serum enzymes, etc., conducted at time of necropsy on the DD Form 1626.
12. Do not-freeze necropsy material either before or after formalin fixation.

**Figure 1. Special Reminders.**

the volume of the tissues. Neutral buffered formalin is recommended and may be prepared according to either of the following formulas:

37 percent to 40 percent formaldehyde. . .	100 ml.
Distilled water. . . . .	900 ml.
Sodium phosphate (monobasic) . . . . .	4 gm.
Sodium phosphate dibasic (anhydrous) . . . . .	6.5 gm.
or	
37 percent to 40 percent formaldehyde. . .	100 ml.
Sodium acetate . . . . .	20 gm.
Tap water . . . . .	900 ml.

b. If a special fixative, such as Zenker's solution, is desired, the specimen must be labeled and packed separately. Tissue is ruined if permitted to stay in Zenker's solution for more than 24 hours. After fixation in Zenker's solution for 12 to 24 hours, tissues must be washed in running water for 24 hours, then placed in 80 percent alcohol. When fixing tissues in Zenker's solution, it is important that the sections be thin (0.5 ml). Zenker's solution is prepared as follows:

Distilled water. . . . .	1000 ml.
Mercuric chloride . . . . .	50 gm.
Potassium dichromate. . . . .	25 gm.
Sodium sulfate. . . . .	10 gm.

Add 5 ml. of glacial acetic acid to 95 ml. of Zenker's fluid before use.

c. The correct fixation and proper labeling of wet tissue are essential before preparing the specimen for either storage or shipment.

(1) Fixation is accomplished by placing the specimen in the desired preservative for a sufficient length of time to allow for adequate penetration of the fixing fluid. The size of the specimen governs the time necessary for complete fixation (approximately 3 to 5 days in formalin).

(2) Fixatives will not penetrate beyond a few millimeters; therefore, large specimens should be properly cut in a manner to permit orientation and ensure complete fixation. After 48 hours, formalin fixed tissue is removed from the original fixative solution, rinsed in water, replaced in a fresh solution of formalin, and prepared for storage or shipment.

**6. Method of Packing for Shipment and Storage.** Any method of packaging for shipping or storage is satisfactory if the tissues do not get lost, damaged, or dehydrated. Help in packing and shipping can usually be obtained from the medical personnel responsible for shipping human pathologic material.

#### a. Plastic Bag Methods:

(1) Plastic bags, if available, are recommended for shipping wet tissue specimens. The plastic that has proven the most durable, pliable, and suitable for this kind of work is .005 inch thick, clear, plastic polyethylene. These bags are included in the Fed-

eral Supply Catalog (FSN 8135-890-1842/46).

(2) Specimens should be placed in a proper size cotton bag or wrapped loosely in sufficient gauze to maintain a moist area of fixative around the tissues. The specimen is then placed in a quantity of fixative slightly in excess of that necessary to saturate the cotton bag or gauze wrapper. This amount is sufficient since the specimen has already been processed for fixation. As much air as possible should be evacuated from the plastic bag and the opening heat-sealed. If a heat sealing iron is not available, the hot edge of an ordinary flat iron can serve as a substitute. If neither of these is available, the specimen bag may be twisted, doubled over, and fastened with a rubber band.

#### b. Glass Container Method:

(1) Wet tissue stored or shipped in glass containers requires the same preparation for proper fixation and identification as tissue packed in plastic bags. Personnel responsible for packing the tissue must be aware of the importance of using only straight, widemouth containers. This type of container permits easy access or withdrawal of the tissue and prevents damage or mutilation of the specimen. Using a container that is too small can result in distortion of the tissue. It also does not provide adequate space to permit a free flow of the preservative around the entire specimen. This could cause the tissue to dry out and lose its pathologic value.

(2) The bottom of each container should be covered with absorbent cotton saturated with the fixing fluid, allowing all parts of the tissue to remain exposed to the preservative. The specimen, with the identifying tag attached, should be inserted in the glass container and sufficient fluid added to cover the specimen. More cotton should be placed in the top of the container to keep the tissue submerged in the fluid. The container's cap should be tightly fastened and the cap and part of the container dipped in melted paraffin. This ensures against leakage and loosening of the cap while in transit. Masking tape bound around the cap and part of the container serves the same purpose. A label should be placed on the outside of each container bearing the same data as is contained on the tag attached to the specimen.

#### c. Metal Can Method:

(1) Metal cans may be used if glass jars or plastic bags are not available. Several types of metal cans may be requisitioned from standard items of issue. However, a more economical method is to re-use cans that have been packed with other items. Such cans are usually available from mess halls, ra-

diology clinics, and dental and photographic laboratories.

(2) Wet tissue stored or shipped in metal cans requires the same preparation for proper fixation and should carry the same proper identification as tissue packed in plastic bags or glass containers.

d. **Packing Box Method.** When preparing a box for shipping materials, pay particular attention to the corners of the box. This is where most of the damage occurs while in transit. Each container should be individually wrapped before it is placed in the shipping box. Sufficient padding should be placed at the base, between the containers, and on top of the containers to make a firm and secure package.

#### e. Special Preparation:

(1) **Bone Specimens.** The specimen should be skinned and all excessive soft tissue removed except for the tissue involved with the disease. The specimen should be placed in a 10 percent formalin solution for a period of 10 to 14 days. Fixation and preservation are much better if the specimen can be sawed in half longitudinally. A portion of the normal bone should also be included; this is useful for study of developmental changes. Radiographs and other photographic materials should accompany all bone or joint specimen cases. The original radiographs are preferred. Radiographs sent with a case to the AFIP are copied and, on request, the original is returned to the contributor. When a bone specimen is ready for shipment, with the identifying tag attached, it should be wrapped in cotton ox gauze saturated with formalin. It is important that the sharp edges of the bone specimens are well padded before shipping in order to prevent cutting of the plastic bags. The label on the specimen container must have the name of the contributing activity, the surgical or necropsy number and year, the animal's name and tattoo number, and the date.

(2) **Eye Specimens.** Contributors are requested to place the eye specimen, immediately after removal, in a 10 percent formalin solution of 20 times its volume. Normally, one eye requires 300 ml. of 10 percent formalin. Enucleated eyes should not be opened. After 48 hours, the eye specimen should be wrapped in cotton saturated in a 10 percent formalin solution. The specimen is then placed with identifying tag, in a small glass container that should be sealed. A label, containing the same data as that shown on the identifying tag, should be placed on the outside of the container. Never use plastic bags to store or ship eye specimens as any undue pressure against the specimen may cause it to rupture or become distorted. An eye specimen should never be suspended in formalin as damage can occur while in

transit due to its shifting against the sides of the container.

### SECTION C-SPECIFIC TECHNICAL SUGGESTIONS

#### 7. Removing the Organs:

a. **Heart.** An initial opening should be made while the heart is in place to disclose a possible embolus. Locate the interventricular septum by palpation and slit the anterior wall of the right ventricle just below the pulmonary artery, as close to the septum as possible. Follow the interventricular septum toward the base of the heart, opening the pulmonary artery.

(1) Remove the heart and place it on the table with the apex toward you, right ventricle on your right. The position of the septum can be felt or estimated from the position of the coronary vessels.

(2) The slit in the right ventricle adjacent to the septum is then enlarged until the apical end is freely opened.

(3) Insert a long, slender knife from this slit through the tricuspid valve into the vena cava until the point appears at the severed end of this vessel.

(4) Cut upward to complete the opening in this side of the heart.

(5) Rinse and examine.

(6) Pass the knife under the valve into the pulmonary artery, following it as it curves toward the left, until the point appears at the severed end of the vessel.

(7) Complete the cut, preferably cutting toward the side to minimize destruction of the tricuspid.

(8) Examine the pulmonary semilunar valves and other structures.

(9) With the heart still in the same position, carry out a corresponding procedure on the left side. First make a slit alongside the septum so that the landmarks inside can be seen and then open the left atrium and pulmonary vein through the bicuspid valve. Finally, open the aorta by entering it with the knife beneath the bicuspid valve.

(10) If there is valvular disease, the heart should be cut, sliced, and submitted in large blocks to include the lesions and contiguous heart wall.

(11) If there is congenital defect, submit the whole heart.

b. **Lungs.** Due to the elastic tissue, lungs are difficult to cut unless they are consolidated, edematous, or the site of neoplasia. If a lung "cuts with ease," there must be considerable pathologic change.

(1) Place the lung on the cutting board with the rounded lateral border of the lung uppermost.

(2) Locate the position of the hilum of the lung

and press the lung down gently, using the **palmar** surface of the left hand. A sponge or towel facilitates holding.

(3) Cut toward the **hilum** using a large, flat knife. Successive cuts may be necessary.

(4) The cut surfaces expose the main pulmonary blood vessels, the bronchi, and their **lobar** branches in a long longitudinal plane.

(5) For microscopic examination, take representative sections from -existing gross lesions, striving to include adjacent, **apparently** normal parenchyma and overlying pleura. Sections should include a portion of the main stem bronchi, contiguous lung parenchyma, and blocks from each lobe, in addition to blocks from areas in which gross pathologic change is obvious.

(6) Orientation of these blocks by labeling is optional.

(7) If the sections of pulmonary tissue float, loosely wrap them in gauze.

(8) If there is a significant pathologic process, such as pneumonia or primary tumor, the entire lung or representative blocks may be fixed. To fix an entire lung or lobe, first suspend it free by the bronchus and then pour **formalin** directly into the lung. At complete distention, when fluid backs up to the surface of the bronchus, tie off the bronchus. The entire piece of lung is then placed in **formalin** and covered with a gauze or absorbent paper. After fixation, lung sections can be cut for storage or shipment.

c. **Kidney.** The **kidney** is usually opened by cutting in a longitudinal **plane** from the **convex** surface toward the pelvis.

(1) Vertical parallel cuts, about 0.5 cm. apart, are then made to secure sections for microscopic examination.

(2) Several cuts may be made without completely separating the pieces, and the whole kidney fixed in formalin.

(3) The specimen for microscopic examination should include:

- (a) The renal capsule (not stripped).
- (b) The renal cortical parenchyma.
- (c) The renal pelvis.

(4) The capsule may be stripped from one-half of each kidney and the surfaces described.

d. **Pancreas.** Preserving blocks from both the head and tail is important.

e. **Smaller Organs;** (Adrenals, pituitary, thyroid, etc.). After incising, the entire organ is placed in **formalin** to ensure complete fixation. Weigh the organ if it appears to be abnormal.

f. **Intestines:** Tissues from the intestine should

be fixed with as little manipulation to the mucosal surface as possible. The best way to do this is to cut out a large section and gently flush it out with either water or formalin. The lumen is then filled with **formalin** and immersed in more fixative. Another method of fixing small sections of intestine is to transect a small piece and then open the lumen with a longitudinal cut. This ensures that the tissue fixes flat and does not curl backwards. The serosal surface of the piece is then placed on a small piece of dry absorbent paper (paper toweling) and floated mucosa-down in a tray of formalin.

#### g. **Calvarium:**

(1) To remove the brain, make a median cutaneous incision from the region of the frontal prominence to a point well behind the occiput. **Reflect** scalp on either side, exposing the temporal muscles to the zygomatic arch. Cut the temporal muscles free from their proximal attachments and from the bone over the dorsal surface and lateral borders of the skull in the temporal **fossa**. The muscles can be left joined at their lower attachment and merely laid to the side or incised and removed altogether. Make a transverse cut through the extensor muscles immediately **caudal** to the occipital protuberance as far as possible toward the **atlanto-occipital** articulation. (Look for signs of trauma at this point.)

(2) After the **calvarium** is exposed, it is necessary to make three cuts through the bone to open the cranial cavity. A chisel and mallet or saw may be used for this purpose. One cut is made transversely at the anterior limit of the cavity, slightly posterior to the supra-orbital processes. Continue this incision ventro-laterally to the zygomatic arch. Next, rotate the cranium to one side and make the second incision through the calvarium from the lateral termination of first incision, **caudal** to the **foramen** magnum. Repeat this procedure on the opposite side, entirely severing the calvarium. Pry up the **freed** portion from the front by means of a chisel or hook, pulling it upward and backward, and divide the origins of the dorsal cervical muscle, thereby freeing the calvarium. Inspect its inner surface and lay it to one side. If cuts in the calvarium are not too deep (leaving dura mater intact), the **dura** will remain on the upper surface of the brain instead of tearing away adhered to the calvarium.

#### h. **Brain:**

(1) Examine the surface of the brain, noting abnormalities such as hemorrhage, opacities, and exudates. If the dura is intact, incise it along the superior longitudinal sinus with scissors or knife. Then incise the **dura** laterally from each end of this longitudinal incision. With thumb forceps grasp the anterior part of the dura and pull upward and back-

ward, breaking the attachment in the longitudinal fissure until the falx **cerebri** is reached. Cut the anterior part of the falx free from the ethmoidal crest and pull the dura and the tentorium **cerebelli** backward, letting them project behind the cranium. Examine the leptomeninges for evidence of abnormality such as hemorrhage, exudates, and scars, noting the character of the cerebral surface.

(2) The brain is an extremely fragile organ and gentle traction and passive gravitational force must be allowed to play important roles in its removal. By means of a sharp scalpel, cut across the olfactory lobes. Next, turn the skull upward so that the brain falls backward by its own weight. With the handle of the knife push the brain gently backward until the optic nerves are visible and sever them close to the ventral dura. Continue to hold the head so that the brain tends to fall out of the cranial cavity; press gently on either temporal lobe. Note the pituitary and prevent its detachment from the brain by incising the **dura** around it and freeing it from the **fossa**. Continue to press the brain out of the cavity. Sever the arteries, the oculomotor nerves, and the veins close to the dura. Meanwhile, support the weight of the brain, which is now partially hanging from the cranial cavity, with the free hand. Cut the remaining cranial nerves and, as the cerebellum and brain stem emerge, sever the cord at the **foramen** magnum, thus allowing the brain to fall into the palm of the hand. Fix the whole brain for a minimum of 5 days with at least two changes of 10 percent neutral **formalin** and submit it intact.

i. **Eyes.** For critical evaluation, eyes should be removed within 5 minutes of the time of death and then fixed, unopened, in their entirety.

(1) Two roughly parallel incisions are made in the skin above and below the eyeball and joined at either side.

(2) Holding both lids with forceps, the eye is dissected out with curved scissors, including the **lacrimal** gland and as much of the optic nerve as possible.

(3) The ocular muscles should then be dissected away and the unopened globe fixed in a liberal quantity of 10 percent formalin.

j. **Parasites.** Specimens of parasites should be collected and submitted along with routine pathologic specimens.

k. **Bone Marrow:**

(1) For the study of cell morphology, the best results are obtained by examining aspirated marrow samples. The sternum and iliac crest are good sampling sites. The marrow should be aspirated in a

dry syringe, placed on a clean slide, and submitted to a clinical pathology laboratory for staining.

(2) Good cytologic results are also obtained by cutting a very thin (2 to 3 mm.) slice from the **cancelate** portion of a vertebral body and placing it in Zenker's fixative using 10 percent glacial acetic acid instead of the usual 5 percent. The acid will usually decalcify the bone in 24 hours without distorting the cells.

(3) Good cell differentiation may then be obtained by using Giemsa stain.

1. **Removal of the Spinal Cord.** If a lesion is suspected in the spinal column, removal of the cord is indicated. Place the animal on its ventral surface with its legs spread wide to maintain it in a stable position. Make an incision from the occiput to the **sacrum** over the spinous processes on the midline. Dissect away the skin and dorsal muscles to expose the vertebrae. Cut through the laminae on either side of the spinous processes using a saw or bone cutting forceps. After removal of the bone, cut through the nerve roots on either side and remove the spinal cord. Incise the dura and prepare sections of the cord for fixation, or fix the whole cord after **incising** the dura to permit flow of fixative.

#### m. **Goxofemoral Joint Removal (Optional):**

(1) Microscopic examination is no longer routinely performed on coxofemoral joints. If histologic examination is desired to clarify or confirm clinical conditions or lesions, care should be taken not to open the joints so that they may be submitted intact.

(2) To free the coxofemoral joint, cut the shaft of the ilium 2 inches anterior to the **acetabulum** and cut the ischium and pubic bones in their narrowest portions as they border the obturator **foramen**. The femur should be severed 1 inch distal to the greater trochanter. The surrounding musculature, except the capsularis **coxae** muscle, should be removed for proper fixation.

(3) The respective right and left sides should be labeled, fixed (as described under bone specimens), and submitted to the AFIP.

**8. Bacteriologic, Viral, and Chemical Examinations.** Properly collecting and submitting specimens is very important. Keep in mind that specimens for bacteriologic, viral, or chemical examination must be sent to appropriate laboratories. These specimens must be collected separately and by different techniques than those required for tissues destined for histologic examination. For guidance, see TM 8-300/NAVMED P-5065/AFM 160-19, Autopsy Manual, chapter V, sections II and III, July 1960. The results of these tests should be included in DD Form 1626.

BY ORDER OF THE SECRETARIES OF THE AIR FORCE AND THE ARMY

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#### SUMMARY OF CHANGES

This revision incorporates new procedures and protocol. It eliminates the requirement of performing a necropsy on untrained dogs that are euthanatized for non-medical reasons at a Procurement Training Center (para 3). There are some deletions and additions of laboratory tests (para 3d), some word changes with more explicit technical directions for performing a necropsy (para 7 g,h). Removal of **coxofemoral** joints is now optional (para 7m). There are space changes in DD Form 1626 to make it easier to record data (atch 1).

**VETERINARY NECROPSY REPORT: CHECKLIST AND EXAMPLE**

The following checklist and example of a necropsy report may be used as a guide for recording postmortem findings.

**CHECKLIST**

	Blocks
<b>Clinical Abstract</b>	<b>8</b>
Include significant illnesses, operations, wounds, fractures, pertinent immunizations, working environment, laboratory and radiologic findings. When euthanasia is performed, specify on Necropsy Report the agent used, amount used, and the route of administration.	
<b>General</b>	11
Approximate or exact weight, condition of the animal, state of rigidity, or postmortem decomposition, Description of carcass including scars, tattoos, wounds, superficial vessels, and lymph nodes; discharge from nostrils, mouth, anus, body openings, or external genitalia. Note presence of cutaneous tumors, bony exostoses or malformations, and hernias, etc. NOTE: Describe significant lesions in detail. Description of normal tissue is optional. NGLR (No gross lesions recognized) may be entered when appropriate. Organ weights are optional unless indicated by lesions.	
<b>Primary Incision (Description or NGLR)</b>	12
Subcutaneous fat, muscles, peritoneum, omentum, intra-abdominal fat, position and relationship of abdominal viscera, adhesions, amount of peritoneal fluid, intra-abdominal and mesenteric lymph nodes, amount of pleural fluid, presence or absence of adhesions; mediastinum.	
<b>Respiratory System (Description or NGLR)</b>	13
The relative size and consistency of the lungs; pleura; cut surface of each lobe; bronchi; presence or absence of parasites; hilum, and contiguous lymph nodes.	
<b>Heart (Description or NGLR)</b>	14
Shape, relative size; epicardium; coronary arteries; measurements of valve orifices and thickness of ventricular walls.	
<b>Aorta and Vessels (Description or NGLR)</b>	15
Specific location and description of lesion observed.	
<b>Spleen (Description or NGLR)</b>	16
Size, consistency, capsule, cut surface, color, dry or moist, and markings.	
<b>Liver (Description or NGLR)</b>	17
Surface: section consistency, color, and markings. Gallbladder and ducts.	
<b>Endocrine Glands (Description or NGLR)</b>	18
Consistency, relative size, cut surface of pancreas, adrenals, thyroids, parathyroids, pituitary, and pineal.	
<b>Gastrointestinal Tract (Description or NGLR)</b>	19
Mouth, tongue, esophagus, stomach, small intestines, cecum, colon, rectum, and anus; nature of contents; appearance of mucosa; thickness of wall; presence of parasites and foreign bodies or blood.	

	Blocks
<b>Urinary System (Description or NGLR)</b>	20
The kidney size and consistency; capsular and cut surfaces; cortical markings; scars; resistance to knife; width and cut surface of cortex; pelvis, pelvic fat; ureters; and large vessels. Distention of the bladder, character of contents; mucosa; wall; ureters; and urethra.	
<b>Genital System (Description or NGLR)</b>	21
Prostate, testes, epididymis and spermatic cords, cervix, vagina, and other adnexa.	
<b>Eyes and Ears (Description or NGLR)</b>	22
Specific location and description of lesions observed.	
<b>Brain (Description or NGLR)</b>	23
Convolutions and sulci; consistency; lateral ventricles.	
<b>Spinal Cord (Descriptions or NGLR)</b>	24
Dura, exudates, and leptomeninges.	
<b>Bone Marrow, Bones, and Joints (Description or NGLR)</b>	25
Ribs, sternum, vertebrae, or shaft of femur. Various articulations (stifle, hock, elbow, carpal joints) should be handled as described in section C.	
<b>Musculature (Descriptions or NGLR)</b>	26
Note the degree of musculature development and any abnormalities in color or texture of major muscular groups.	

VETERINARY NECROPSY REPORT				DATE OF REPORT	
				12 Jun 19XX	
1. NAME AND ADDRESS OF UNIT ACCOUNTABLE FOR ANIMAL				2. BREED AND SPECIES	
3. NAME AND TATTOO, BRAND NO. NO.		4. SEX	5. DATE OF BIRTH	6. DATE OF DEATH	7. HOURS BETWEEN DEATH & NECROPSY
REX OF 36		M	Oct 19XX	11 Jun 19XX	2
8. CLINICAL ABSTRACT (Continue on separate sheets and attach) Include a description of significant past and present illnesses and laboratory findings. Where possible give agent used in euthanasia and route of administration. (Continue in block 28 or attach page.)					
9. CLINICAL DIAGNOSES					
(1) Paroxysmal Tachycardia (2) Systolic Heart Murmur (3) Congestive Heart Failure					
10. GROSS NECROPSY DIAGNOSES					
(1) Chronic Valvular Disease (2) Congestive Heart Failure					
GROSS FINDINGS (If more space necessary continue on blank sheets and identify the item)					
11. GENERAL (Weight, condition of cadaver, hair coat, body orifices, scars, wounds, superficial tumors, etc.)					
Tattoo No. OF36 clearly legible on the inner aspect of the left ear flap. Weight of cadaver - 60 lbs. The body is that of an aged, male-German shepherd dog in an underweight condition.					
12. PRIMARY INCISION (Subcutaneous fat, muscles, peritoneum, position of viscera, body lymph nodes, etc.)					
Very little subcutaneous fat is evident. 1700 ml. of reddish-serous-like fluid present in the abdominal cavity. 75 ml. of similar fluid present in the thoracic cavity.					
13. RESPIRATORY SYSTEM (Larynx, trachea, bronchi, lymph nodes, lungs, pleura, etc.)					
Small amount of pink frothy fluid in the trachea. The lungs are pale and have a somewhat firmer consistency than normal. Very little blood comes from a cut surface of the lung. The anterior portion of the left apical lobe (an area about 2 inches in diameter) is thickened, hemorrhagic, and has pleural adhesions. This is apparently associated with the intrathoracic injection. of resuscitative agents on 11 June. wt. of right lung - 350 gms.; Left lung - 283 gms.					
14. HEART (Pericardium, epicardium, myocardium, endocardium, valves, blood vessels, etc.)					
10-15 ml. of reddish fluid present in the pericardial sac. The heart is moderately enlarged. The mitral and tricuspid valves are irregular and thickened. The cusps of the aortic valve have transverse bands of fibrous tissue, The pulmonary valve is normal. Wt. of heart - 372 gms.					

<p>15. ARTERIES, VEINS AND LYMPHATICS</p> <p>No gross lesions recognized (NGLR).</p>
<p>16. SPLEEN (<i>Size, color, consistency, etc.</i>)</p> <p>Contracted, grossly normal in appearance. wt. - 90 gms.</p>
<p>17. LIVER (<i>Gall Bladder, bile ducts</i>)</p> <p>Dark, reddish-black. Enlarged with edges rounded. Friable. Firmer in consistency than normal. Wt. - 1250 gms.</p>
<p>18. ENDOCRINE GLANDS (<i>Thyroid, parathyroids, thymus, pituitary, pancreas, adrenals, pineal</i>)</p> <p>The thyroid/parathyroid glands weighed 10 gms. each. No gross lesions were observed. The pancreas weighed 65 gms.; a few scattered petechial hemorrhages were noted beneath the capsular surface. Both adrenals were engorged with blood.</p>
<p>19. GASTROINTESTINAL TRACT (<i>Mouth, tongue, esophagus, stomach, small intestine, cecum, colon, rectum and anus</i>)</p> <p>Teeth are all badly worn. Only 1/4" of the canine teeth remain. The esophagus contains a small amount of bile stained fluid material. The stomach and intestine, contain a small amount of semi-solid material. No parasites seen.</p>
<p>20. URINARY SYSTEM (<i>Kidneys, ureters, bladder, urethra</i>)</p> <p>Bladder contains 40 ml. of clear yellow urine. Ureters, kidneys, and bladder are grossly normal in appearance.</p> <p>Wt. of right kidney - 100 gms. Wt. of left kidney - 98 gms.</p>
<p>21. TESTES, OVARIES, UTERUS, ACCESSORY SEX STRUCTURES</p> <p>All genital organs appear grossly normal.</p>

**21. TESTES, OVARIES, UTERUS, ACCESSORY SEX STRUCTURES (Continued)**

NGLR.

**22. EYES AND EARS (External, middle and inner portions)**

NGLR

**23. BRAIN**

The vessels of the leptomeninges **were** distinct and engorged with blood. The gross structure of the brain **was** symmetrical.

**24. SPINAL CORD**

There was a locally **inflamed** area at the second lumbar vertebra, the cord deviated slightly to the right and appeared to be compressed. This abnormality seemed to be caused by a fibrinous mass attached to the bony structure on the left inner aspect of the **spinal cord**. A 25 cm. portion of the spinal cord and associated bony structure were fixed in 10% formalin.

**25. BONE MARROW, BONES, AND JOINTS**

No gross lesions are seen in the marrow of the sternum, vertebrae, or the femurs. Special attention was given to the examination of the joint surfaces of all four legs. NGLR.

**26. MUSCULATURE**

No abnormalities noted other than the slightly diminished size of the skeletal muscles associate? with the underweight condition.

<b>27. EXAMINATIONS CONDUCTED AT DIAGNOSTIC LABORATORIES</b>		
<b>BACTERIOLOGIC CULTURES:</b>		
<b>CLINICAL PATHOLOGY DATA:</b> <i>(Complete the following and/or attach multiple analyzer report. If serial data are available, please tabulate in Remarks or attach.)</i>		
TOTAL WBC _____ /MM <sup>3</sup>	BUN _____ MG%	URINE CREATININE _____ MG%
DIFF: NEUT _____ %	SERUM PROTEIN _____ MG%	URINE-PROTEIN _____ MG%
BANDS _____ %	A : G _____	URINE-GLUCOSE _____ MG%
LYMPH _____ %	SGOT _____ UNITS	URINE SP. G. _____
MONO _____ %	SGPT _____ UNITS	URINE-EXAMS: _____
EOS _____ %	ALK. PHOS _____ UNITS	
PCV _____ %		
HB _____ GM%		
OTHER <i>(Fecal exams, lipase, trypsin digestion, etc.)</i>		
Semiannual Knott's tests and/or millipore filtration techniques for microfilaria of heart worms have been negative over the past 4 years.		
<b>28. REMARKS</b>		
Specimens from the following organs submitted for histopathological study: cervical and bronchial lymph nodes; right thyroid and parathyroid glands; prostate; cusps of aortic, mitral and tricuspid valves; heart; lungs; pancreas; small and large intestines; liver; spleen; adrenal gland; kidneys; stomach; brain and spinal cord.		
<b>29. NAME AND ADDRESS OF REPORTING UNIT <i>(Include Zip Code)</i></b>		
TYPED NAME, GRADE AND UNIT OF PROSECTOR	SIGNATURE	

### SUGGESTED EQUIPMENT AND SUPPLIES

The type of instruments used in performing necropsies depends largely on individual preference. The following listed standard medical supply items are suitable for use:

Nomenclature	Federal Stock Number
Knife, Cartilage, Curved, 7 inch	65X-343-7100
Forceps, Tissue, Russian, 6 inch	65X-299-8325
Forceps, Bone Cutting, Straight, <b>Liston</b> , 8 $\frac{3}{4}$ inch	<del>6515-331-1800</del>
Ronguer, Curved, Hartmann, 7 $\frac{3}{4}$ inch	6515331-600
Forceps, Dressing, Straight, 5 $\frac{1}{2}$ inch	<del>6515-333-3600</del>
Forceps, Hemostatic, Straight, <b>Rankin</b> , 6 $\frac{1}{4}$ inch	<del>6515-334-7100</del>
Forceps, Ear, Bayonet Shaped, <b>Lucae</b> , 5 $\frac{1}{2}$ inch	6X5-333-6600
Mallet, Autopsy, Metal, with Hook	6515-340-6500
Blade, Surgical Knife, Detachable, Sterile, No, 15, 6s	<del>6515-660-0008</del>
Handle, Surgical Knife, Detachable Blade #3	65X-344-7800
Probe, General Operating, 10 inch	<del>6515-356-9500</del>
Saw, Amputating, Satterlee, 8 inch	<del>6515-363-1100</del>
Scissors, General Surgical, Straight, Mayo, 6 $\frac{3}{4}$ inch	<del>6515-364-0920</del>
Scissors, Enterotomy, 8 inch	<del>6515-364-2100</del>
Scissors, Iris, Angular, 4 $\frac{1}{2}$ inch	65X-364-4200
Scissors, General Surgical, Straight, 7 inch	<del>6515-365-0640</del>
Scale, Dial Indicating, Commercial, Autopsy	<del>6670-439-1100</del>
Rule, Measuring, Ophthalmological-Rhinological, Plastic, 17 cm	<del>6515-362-6200</del>
Saw, Bone-Cutting, Autopsy, <b>Stryker</b> , 110 volt, AC-DC	<del>6515-299-8717</del>
Field Post-mortem Kit, Veterinary	6545-145-0094

