

*Techniques in Necropsy:
Pathway to Knowing "Everything"*

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NCSU-CVM Class of 2011

Summer Zoo Rounds

June 12, 2008

The Post-Mortem Exam

- ⊕ Patient history
- ⊕ Necropsy
- ⊕ Histopathology
- ⊕ Microbial culture/isolation
- ⊕ Toxicity screening
- ⊕ Gene analysis

Definition

⊕ Necropsy

⊕ “seeing a dead body” (Greek)



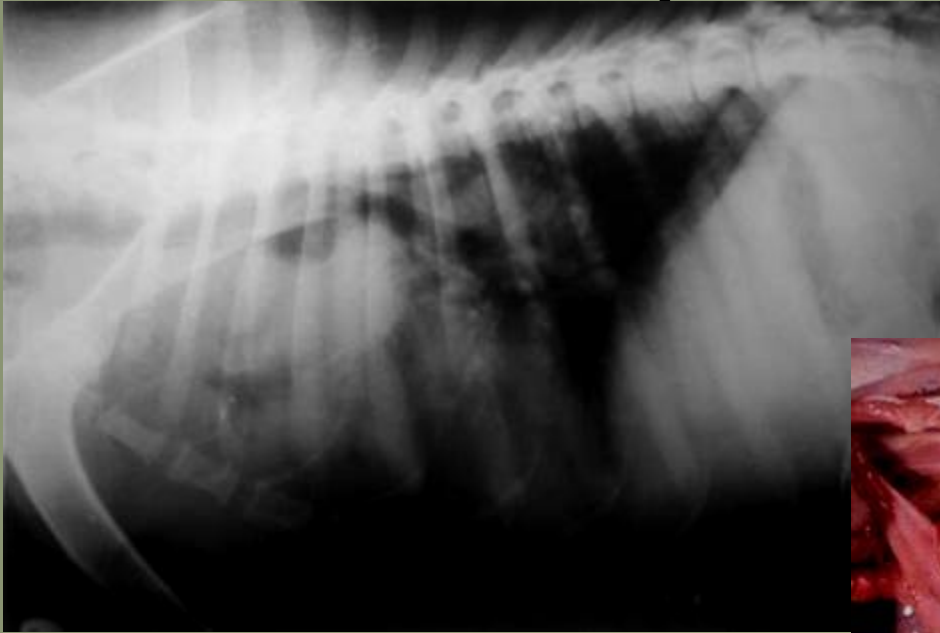
Spyglass Entertainment Group, *The Sixth Sense*, 1999

Why do a necropsy?

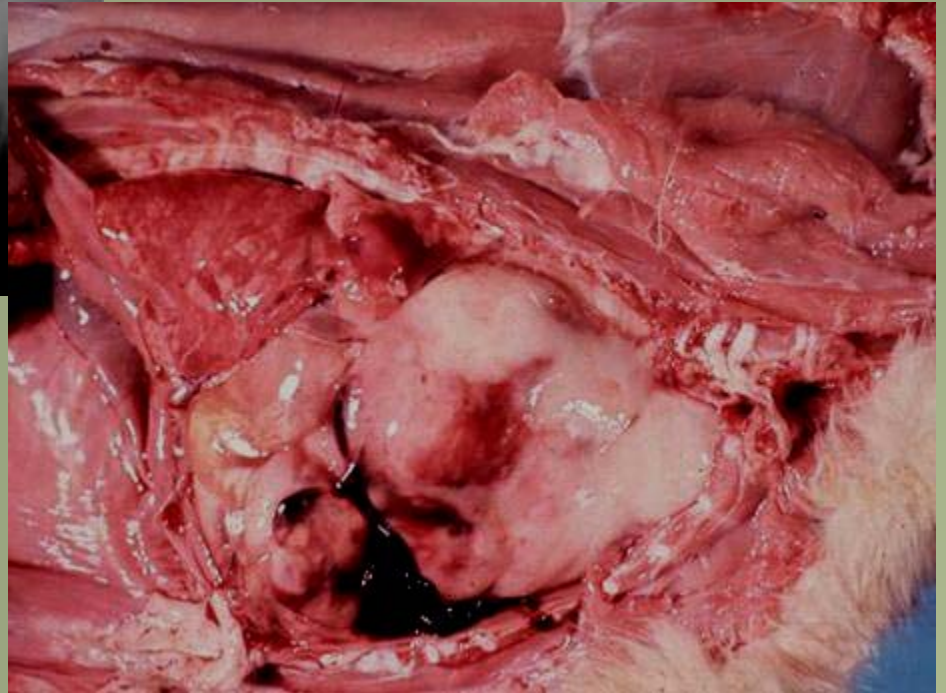
- ⊕ Diagnostic
- ⊕ Prevention
- ⊕ Evaluate health of a population
- ⊕ Educational



Why do a necropsy?



http://www.isrvma.org/article/54_3_7.htm



<http://w3.vet.cornell.edu/nst/nst.asp?Fun=Image&imgID=1575>

Necropsy Facility



Necropsy Facility



Necropsy Facility



Basic Equipment

- ⊕ Sharp knife and steel
- ⊕ Scissors
- ⊕ Tree limb snips
- ⊕ Handsaw
- ⊕ Rongeurs
- ⊕ Ruler
- ⊕ Tissue containers

Basic Equipment



Basic Equipment



Basic Equipment



Basic Equipment



Goals of Necropsy

- ⊕ Data collection
- ⊕ Concise lesion description
- ⊕ Appropriate tissue sampling
- ⊕ Correlate findings with in-life data.



Data Collection

- ⊕ Review history
- ⊕ Systematic
- ⊕ Necropsy record
 - ⊕ Signalment and ID
 - ⊕ Date/time of death
 - ⊕ Date of necropsy
 - ⊕ List of tissues examined
 - ⊕ Description of lesions

Necropsy Record

PART B - ANIMAL IDENTIFICATION AND RELATED DATA					
8. ANIMAL I.D. <i>(Name and Tattoo Number)</i>		9. SPECIES		10. BREED	
11. DATE OF BIRTH <i>(YYYYMMDD)</i>	12. AGE	13. SEX	14. NEUTERED <input type="checkbox"/> YES <input type="checkbox"/> NO	15. WEIGHT	16. COLOR
17. EUTHANIZED <i>(Specify method and agent used.)</i> <input type="checkbox"/> YES <input type="checkbox"/> NO					
18. CAUSE OF DEATH <i>(Medical reason for death or decision to euthanize.)</i>					
19. NAME AND ADDRESS OF UNIT ACCOUNTABLE FOR ANIMAL					
20. CONTRIBUTOR'S NECROPSY NUMBER		21. DATE OF DEATH <i>(YYYYMMDD)</i>		22. TIME BETWEEN DEATH AND NECROPSY	



Necropsy Record

SECTION IV - TISSUE CHECKLIST	
Use this checklist to record all tissues collected for submission. In the "Other" section, list any additional tissues collected that are not on the checklist. Tissues are listed in order of descriptive protocol. See TS MED 263 for an alphabetical list.	
34. MILITARY WORKING DOG (MWD) NAME	35. MWD TATTOO
36. ITEM	
<input type="checkbox"/> EYES (LEFT/RIGHT)	<input type="checkbox"/> SPLEEN
<input type="checkbox"/> LACRIMAL GLAND	<input type="checkbox"/> MESENTERIC LYMPH NODE(S) *
<input type="checkbox"/> AXILLARY LYMPH NODE(S) (LEFT/RIGHT) *	<input type="checkbox"/> STOMACH
<input type="checkbox"/> HAIRED SKIN (SPECIFY SITE IN REMARKS)	<input type="checkbox"/> DUODENUM
<input type="checkbox"/> MAMMARY TISSUE (IF APPLICABLE)	<input type="checkbox"/> JEJUNUM
<input type="checkbox"/> SKELETAL MUSCLE	<input type="checkbox"/> ILEUM
<input type="checkbox"/> BONE MARROW	<input type="checkbox"/> ILEOCECOCOLIC JUNCTION
<input type="checkbox"/> THYROID AND PARATHYROID GLANDS *	<input type="checkbox"/> CECUM
<input type="checkbox"/> MANDIBULAR SALIVARY GLANDS	<input type="checkbox"/> COLON
<input type="checkbox"/> ADRENAL GLANDS (LEFT/RIGHT)	<input type="checkbox"/> RECTUM
<input type="checkbox"/> THYMUS/THYMIC REMNANTS *	<input type="checkbox"/> ANUS/PERIANAL AREA/ANAL SAC
<input type="checkbox"/> BONE (RIB, STERNEBRA; SPECIFY OTHER SITE)	<input type="checkbox"/> EAR CANAL
<input type="checkbox"/> TONSILS (LEFT/RIGHT) *	<input type="checkbox"/> BRAIN (INTACT)
<input type="checkbox"/> TONGUE	<input type="checkbox"/> PITUITARY GLAND *
<input type="checkbox"/> ESOPHAGUS	<input type="checkbox"/> SPINAL CORD (INTACT)
<input type="checkbox"/> MEDIAL RETROPHARYNGEAL LYMPH NODE(S) *	<input type="checkbox"/> PERIPHERAL NERVE (SPECIFY)
<input type="checkbox"/> DIAPHRAGM	<input type="checkbox"/> OTHER (SPECIFY)
<input type="checkbox"/> KIDNEYS (LEFT/RIGHT)	
<input type="checkbox"/> URETERS	
<input type="checkbox"/> URINARY BLADDER	
<input type="checkbox"/> URETHRA	
<input type="checkbox"/> PROSTATE GLAND	
<input type="checkbox"/> TESTES/EPIDIDYMIDES (LEFT/RIGHT)	
<input type="checkbox"/> UTERUS; CERVIX; VAGINA	
<input type="checkbox"/> OVARIES (LEFT/RIGHT)	
<input type="checkbox"/> ILIAC LYMPH NODE(S) (LEFT/RIGHT) *	
<input type="checkbox"/> AORTA, ABDOMINAL (SPECIFY OTHER SITE)	
<input type="checkbox"/> HEART (ENTIRE ORGAN, OPENED)	
<input type="checkbox"/> TRACHEA/LARYNX	
<input type="checkbox"/> TRACHEOBRONCHIAL LYMPH NODE(S) (L/R) *	
<input type="checkbox"/> LUNG	
<input type="checkbox"/> PANCREAS	
<input type="checkbox"/> LIVER	
<input type="checkbox"/> GALLBLADDER	
	REMARKS:

DD FORM 1626, OCT 2001

Reset

Page 7 of 12 Pages

SECTION III - GROSS FINDINGS	
<i>(If more space is needed, identify the tissue and continue on a blank sheet.)</i>	
GENERAL (Condition of cadaver, haircoat, body orifices, scars, superficial lesions/tumors, etc.)	
WEIGHT <input type="text"/>	
	
Ventral	Dorsal

Lesion Description

- ⊕ Tissue
- ⊕ Location
- ⊕ Color
- ⊕ Size
- ⊕ Shape



<http://w3.vet.cornell.edu/nst/nst.asp?Fun=Image&imgID=6708>

Lesion Description

- ⊕ Consistency and texture
- ⊕ Number and extent
- ⊕ Surface appearance
- ⊕ Odor



Tissue Sampling

- ⊕ Cytology
- ⊕ Light microscopy
- ⊕ Microbial isolation
- ⊕ Molecular analysis
- ⊕ Toxicology
- ⊕ Electron microscopy

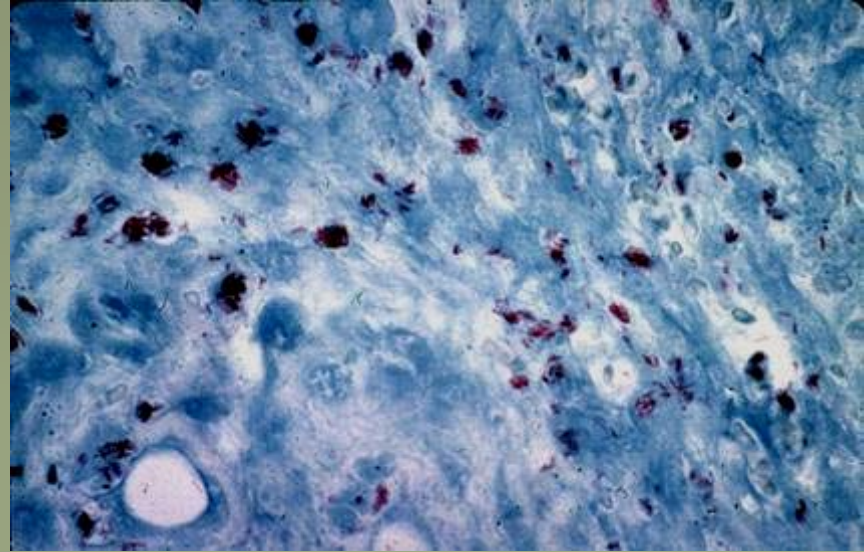
Cytology

- ⊕ Prior to fixation
- ⊕ Touch impression
- ⊕ Smears
- ⊕ Skin scrape
- ⊕ Fine needle aspirate (FNA)



<http://w3.vet.cornell.edu/nst/nst.asp?Fun=Image&imgID=6292>

Light Microscopy

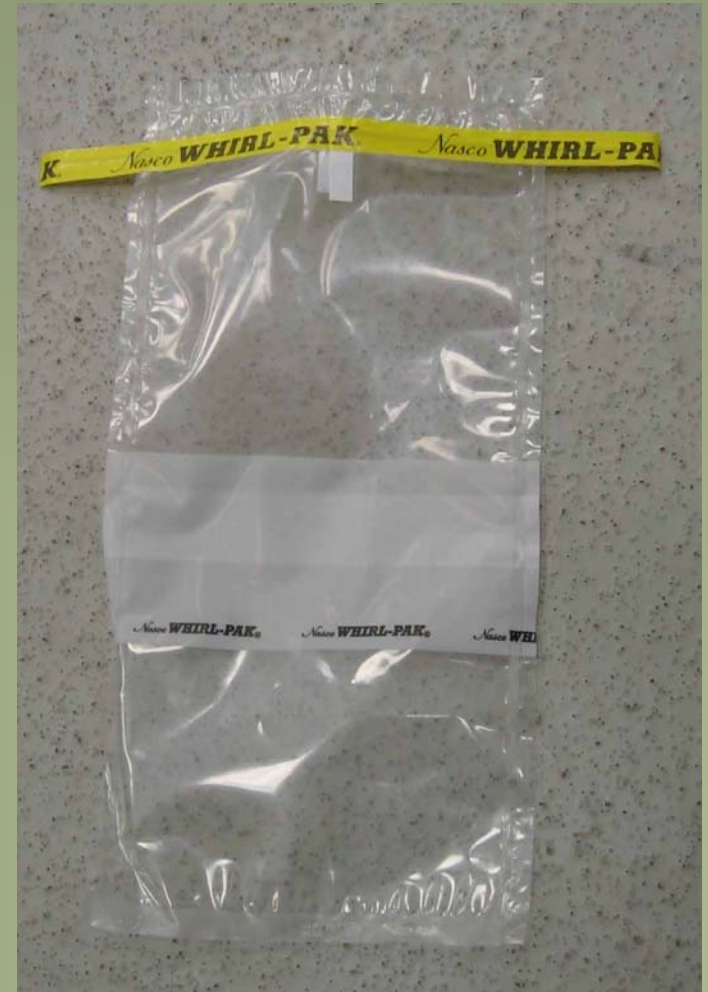


<http://w3.vet.cornell.edu/nst/nst.asp?Fun=Image&imgID=9531>

- ⊕ Formalin fixed
- ⊕ <1cm thick
- ⊕ >10:1 fixative:tissue ratio
- ⊕ Representative samples should include junction between normal and abnormal
- ⊕ Histochemistry and immunohistochemistry

Microbial Isolation

- ⊕ Fresh tissue
- ⊕ Transport media
- ⊕ Frozen tissue (viruses)



Molecular Analysis

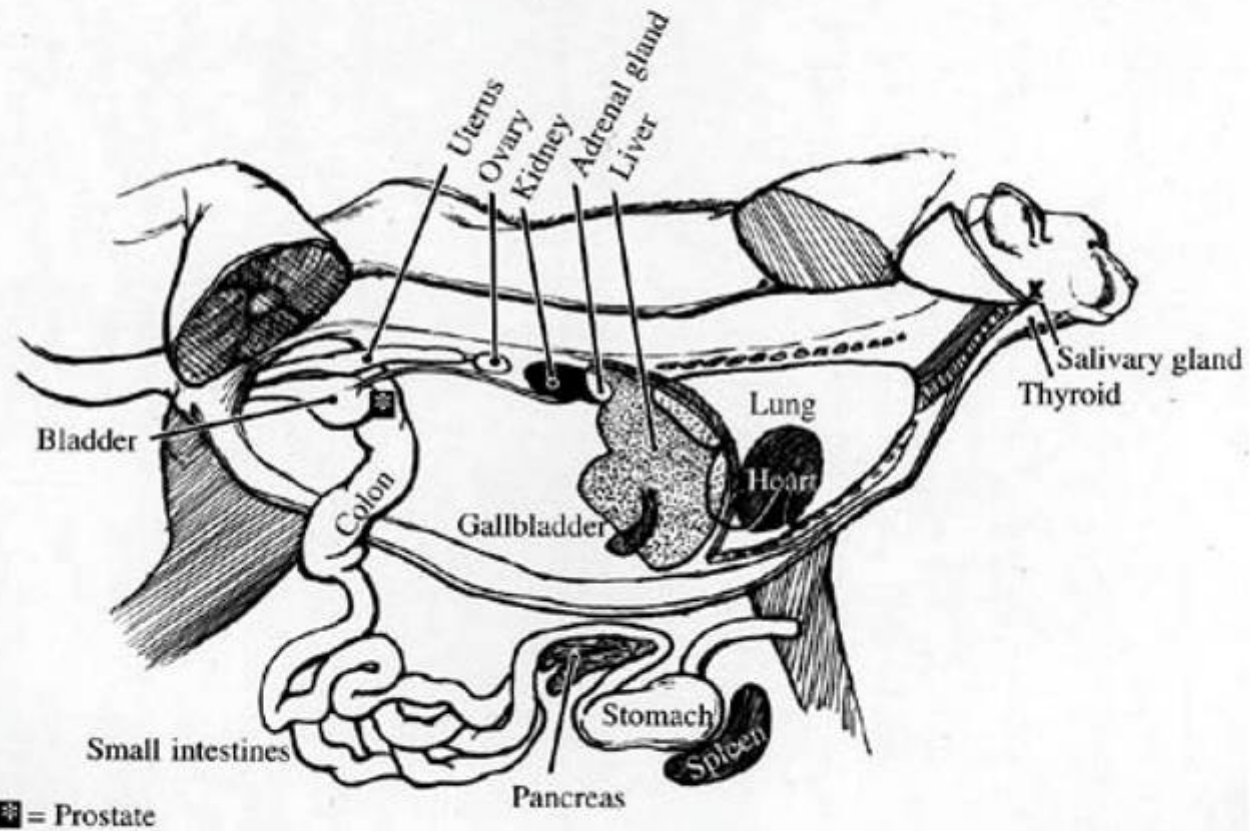
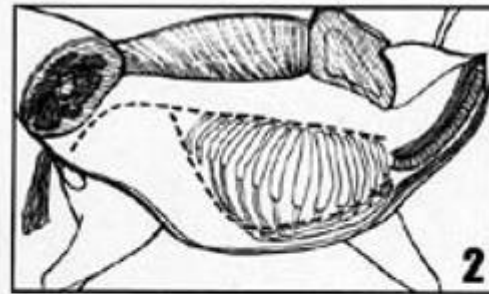
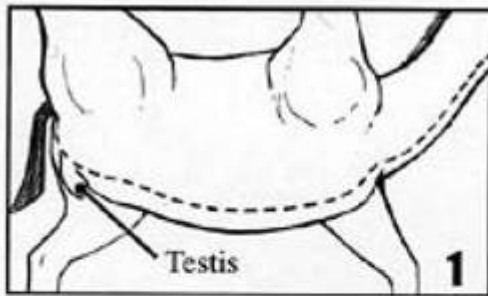
- ⊕ Pathogen identification
- ⊕ Frozen samples are preferred

Toxicology

- ⊕ Fresh or frozen tissue
- ⊕ Liver, kidney, skeletal muscle, fat

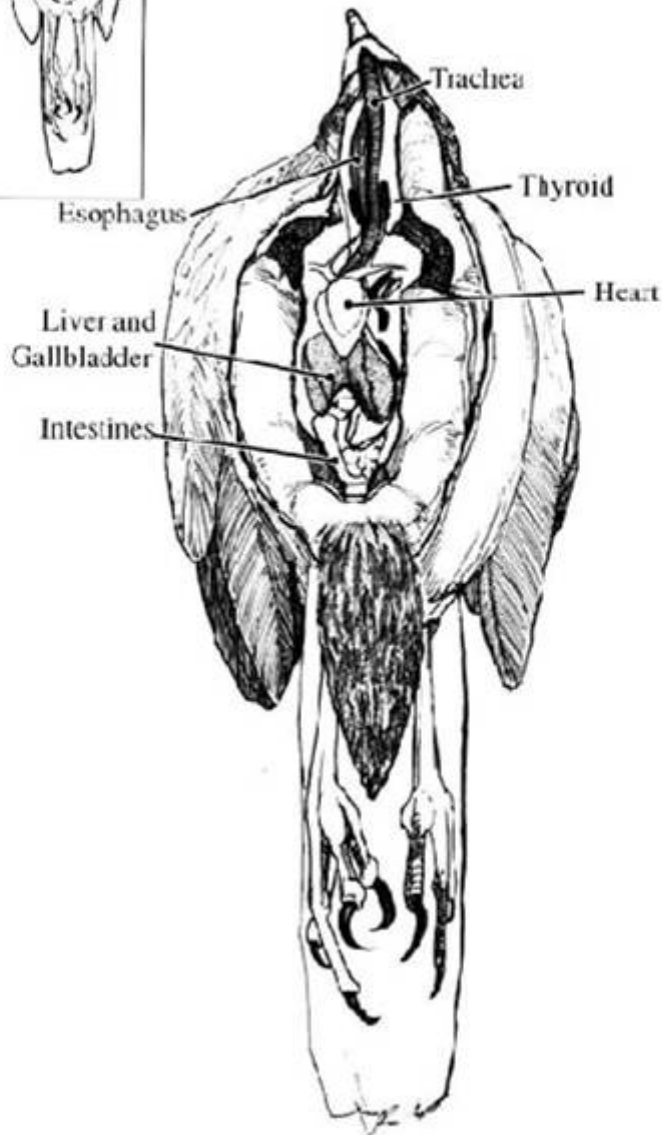
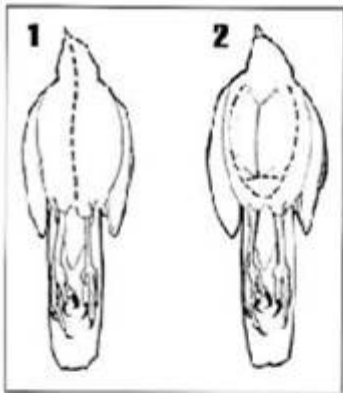
Electron Microscopy

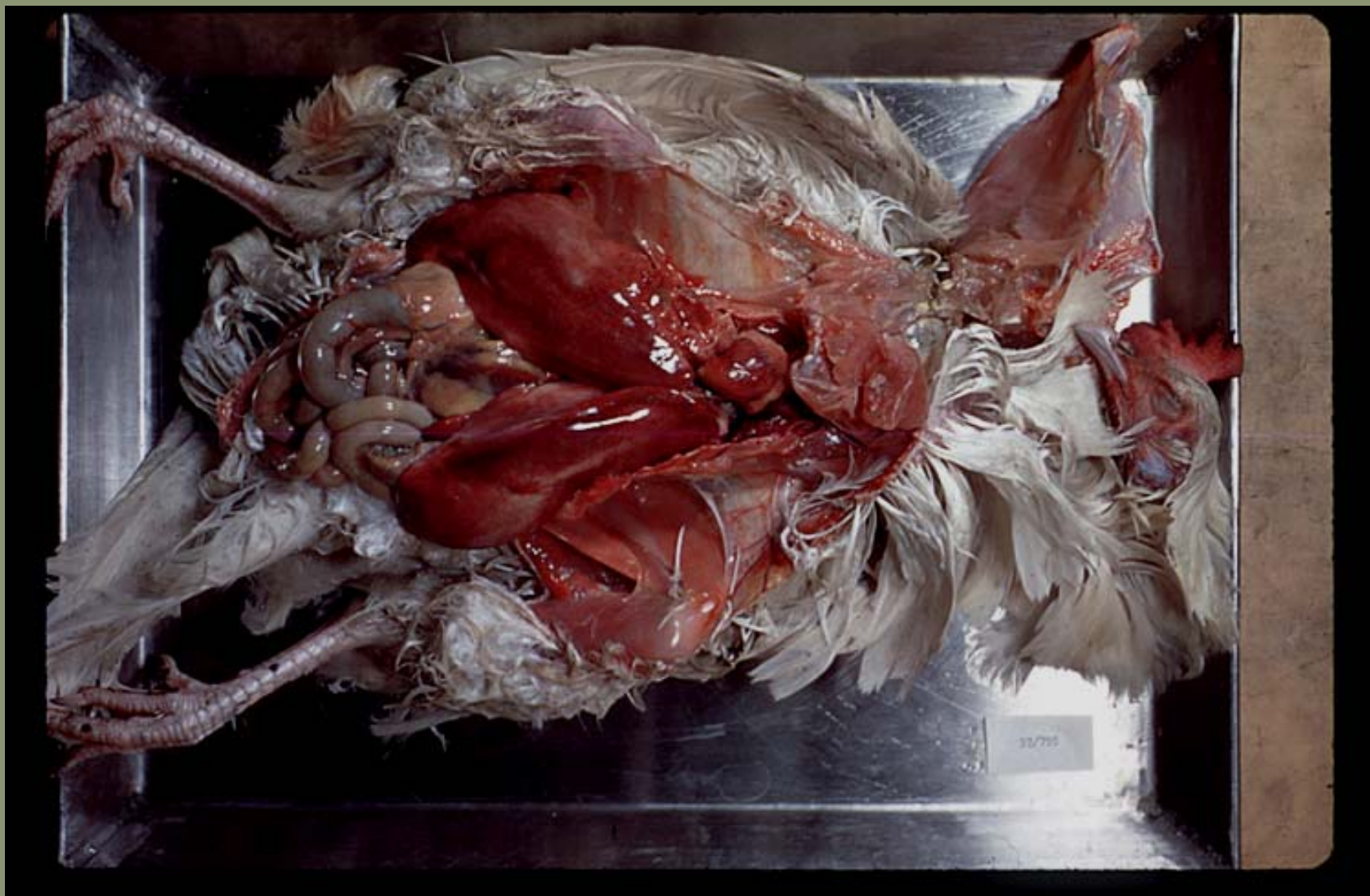
- ⊕ 1% glutaraldehyde
- ⊕ Tissue perfusion
- ⊕ Paraffin embedded tissue



dkhaines©1997 The University of Tennessee College of Veterinary Medicine

Carnivore

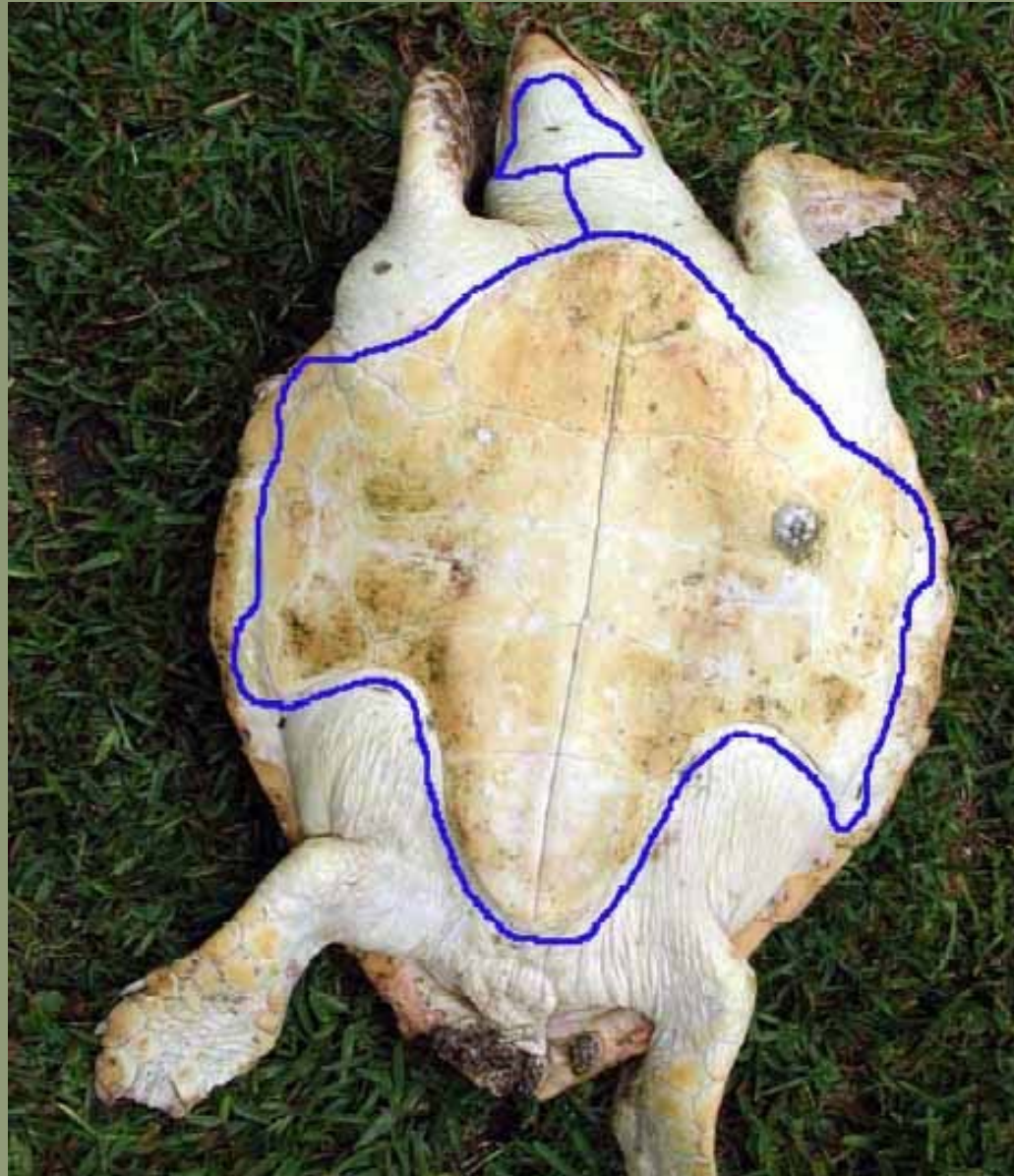




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<http://w3.vet.cornell.edu/nst/nst.asp?Fun=Image&imgID=18902>



http://courses.science.fau.edu/~jwyneken/sta/SeaTurtleAnatomy-Methods_of_Dissection.pdf

Summary

- ⊕ Start big; work towards small
- ⊕ Be consistent
- ⊕ Return to the animal's history
- ⊕ Collect extra tissue if unsure
- ⊕ Do it as often as you can

Want Necropsy Experience?

- ⊕ Gross Pathology Rounds
 - ⊕ Every Wednesday 12:15-1:15

- ⊕ Saturday Morning Necropsy Volunteers
 - ⊕ See PathHeads board for available dates

References

- ⊕ Department of Defense. Veterinary Necropsy Report Checklist and Guidelines (DD Form 1626). Oct. 2001. 10 June 2008 <<http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd1626.pdf>>.
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