

Practical Guide for Veterinary Professionals to Animal Abuse Recognition, Response, and Forensics

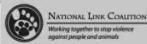


Part 4: Forensic Techniques:
An Introduction to Clinical Forensic Medicine

Phil Arkow, Coordinator, National LINK Coalition –
The National Resource Center on The Link between
Animal Abuse and Human Violence



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PRESENTATION OBJECTIVES:

1. Help you understand your obligations and options when you suspect an animal welfare issue (large- and small-animal).
2. Provide guidance in case conversations with your clients about their animals' welfare become confrontational.
3. Describe practice guidelines regarding assessment, data collection, record-keeping, and practice protocols.
4. Help you understand what is involved in animal welfare investigations and prosecutions.
5. Provide resources and support.



ROLE OF THE VETERINARIAN IN FORENSIC CASES

- Triage
- Examination & treatment of live victims
- Necropsy of deceased victims
- Identify, document and preserve evidence
- Assessment of scene and its effects on victims
- Detailed, methodical documentation of physical condition of animal(s)
- Document changes in response to care & treatment
- Comment on reasonably prudent actions that could have been taken
- Expert witness testimony



PRESENTATION OUTLINE:

Part 1: The “Link”:
Implications of Animal Abuse on
Animal and Human Health



Part 2: How Do I Know
if it's Abuse?:
Clinical and Diagnostic Indicators
of Potential Animal Abuse



Part 3: Resolving Your
Concerns:
Addressing Practice
Management Issues in the
Response to Suspected
Animal Abuse

Part 4: Forensic Techniques:
A Basic Introduction to Clinical
Forensic Medicine

VETERINARY FORENSICS: SIMILAR TO HUMAN MEDICAL EXAMINER, BUT BROADER:

Veterinary forensic medicine expands the core skill set of practitioners and allows veterinary facts and opinions to serve the purpose of the law.

Animal victims cannot speak; the forensic veterinarian can create a narrative and provide a voice for the voiceless in a court of law.

(Lockwood & Touroo, 2016)



ROLE OF THE VETERINARIAN IN FORENSIC CASES

- Determine cause of death, sequence of injuries, and estimate timing of ante- or post-mortem wounds
- Offer opinion to distinguish between accidental/NAI
- Offer opinions regarding speed of unconsciousness or death and degree of pain or suffering to help courts determine if death was humane



ROLE OF THE VETERINARIAN IN FORENSIC CASES

REMEMBER: Animal cruelty is a legal, not a medical, determination. You are NOT the judge and jury:

- Your report supports other investigators
- Prosecutor will decide about charges
- Court will determine guilt or innocence



ASSESS THE ANIMAL'S PAIN

Comfort ↔ Discomfort ↔ Distress ↔ Pain

- State of equilibrium.
- Good health.
- Accustomed to environment.
- Engages normally in routine activities.

- Minimal change in animal's comfort.
- Stressors alter biologic equilibrium.
- Subtle, abnormal behavioral signs.

- Unpleasant escape from or adapt to internal or external stressors.
- Negative effect on well-being.
- Signs are observable.
- Abnormal behavioral signs are overt.

- Unpleasant sensory/ emotional experience with actual/potential tissue damage.
- Species differ in displaying pain.
- Can be acute or chronic, physiological or pathological. Use Pain Scales.

↔ Suffering →

- Unpleasant state of mind that disrupts quality of life.
- Look for evidence that animal is trying to escape the situation.



Rachel Touroo, Director, Veterinary Forensics ASPCA



TIPS FOR CONDUCTING INVESTIGATIONS WHEN ABUSE IS SUSPECTED

Use of Photography

- Minimum: take photos in sequence of 3:
 - Full-body
 - Mid-range to establish context
 - Close-up (macro) with ruler for scale if necessary
- 6 views if needed:
 - L/R lateral, cranial, caudal, dorsal, ventral
- Before-& afters are useful
 - Photograph & document changes in body weight, BCS, before & after treatment

(Smith-Blackmore, AAHA Trends, 2016)



TIPS FOR CONDUCTING INVESTIGATIONS WHEN ABUSE IS SUSPECTED

Conduct forensic exams the same as clinical exams

- Palpate fully for symmetry or swelling
- Perform ophthalmic, otoscopic and oral exams
- Conduct CBC, chem panel, fecal, urinalysis, etc.
 - Draw samples before correcting deficits
- Radiographs as necessary
- Note patient's behaviors, vocalization, heart rate, posture, attitude
- Assess patient's level of pain...



(Smith-Blackmore, AAHA Trends, 2016)



ASSESS THE ANIMAL'S PAIN

NOTE: The inability of an animal to self-report pain in no way negates the possibility that it is experiencing pain and is in need of appropriate pain-relieving treatment.



Animals in pain or suffering may be too weak to demonstrate abnormal behaviors or may have developed learned helplessness, especially under prolonged abuse.

Abnormal behavior: dog cowers, displays avoidance, withdrawal, abnormal posture. Assess for underlying disease processes. Document behavior.

Photo: San Bernardino City Animal Control



TIPS FOR CONDUCTING INVESTIGATIONS WHEN ABUSE IS SUSPECTED

USE OF PHOTOGRAPHY

DATA CARD: 1st photo showing case number, location, animal ID and date, next to animal.

NUMBER: Number photos in sequence.



FINDINGS: Photograph abnormal findings. Use scale for sizing.

VIDEO: Could show animal's gait, movement, vocalizing pain



REPEAT FOR EACH ANIMAL INVOLVED

— Diane Balkin & Rachel Touroo

Data card and scale. Photos: ASPCA



TIPS FOR CONDUCTING INVESTIGATIONS WHEN ABUSE IS SUSPECTED

- **SIGNALMENT** (systematic identification of distinguishing features)
 - Date and time of examination
 - Animal's name, species, gender and reproductive status, age, color, unusual markings, tattoos, microchips, license/tags
 - Name of owner, contact information, how long owner has had animal



TIPS FOR CONDUCTING INVESTIGATIONS WHEN ABUSE IS SUSPECTED

- **Forensic examination of crime scene (situational evidence)**
 - Animal fighting, hoarding, herd starvation, etc.
 - Note lighting, ambient temperatures, water, shelter, smells, ammonia levels, hazards, toxic plants, animals or substances
 - Recover physical evidence linking suspect to scene (e.g., projectiles, ligatures, etc.)



THE WRITTEN REPORT

The written report: objective, non-accusatory

- ID of animal: species, breed, gender, age, color, etc.
- Summary of physical examination findings indicating abuse, cruelty or neglect.
- Diagnostic tests performed and results.
- Treatments provided, recommended, (not) followed.
- Articulate opinion as to what caused animal's condition.
- Did owner's acts or omissions endanger animal's life or health, or cause non-life-threatening harm?



TIPS FOR CONDUCTING INVESTIGATIONS WHEN ABUSE IS SUSPECTED

- Use all your senses
- Don't overlook the unremarkable
- Don't focus only on the chief complaint
- Detail coat and dental conditions
- Examine mouth, paws, fur for chemicals or fibers
- Examine nails for fraying
- If animal bit or scratched attacker, evidence may be embedded in claws or teeth



TIPS FOR CONDUCTING INVESTIGATIONS WHEN ABUSE IS SUSPECTED

- **VERBAL ACCOUNT OF INJURY**
 - Client's reason for bringing animal in and chief complaint
 - Document client's presentation regarding animal's condition, including:
 - Relationship
 - Behavior
 - Conduct concerning animal's injury
 - Changes/inconsistencies in the account
 - Timeliness in seeking veterinary care



THE WRITTEN REPORT

The written report: objective, non-accusatory

- "Consistent with non-accidental injury"
- "Signs suggestive of deliberate maltreatment"
- "This cat was suffering from a life-threatening collapsed lung due to blunt force trauma caused by a beating, and the owner did not seek treatment for the cat."
- "Although the broken leg was not life-threatening, this dog experienced unnecessary pain and suffering due to lack of care by the owner."



THE WRITTEN REPORT

Enter information in patient's clinical record

- Confidentiality varies by state; affected by:
 - Need for a court order or subpoena
 - Request from regulatory or health authority, physician or veterinarian to investigate threat to human or animal health
 - When part of animal cruelty investigation
- Even if no referral is made, entering suspicious information now ensures future incidents are dealt with appropriately.



EVIDENCE COLLECTION & PRESERVATION

The Chain of Custody

- Label & record all evidence; ensure accounted for at all times. Maintain its integrity in secure storage area.
- Maintain evidence log with details of each item
- Keep chronological record of movement or transfer of any sample or physical evidence
 - Include courier services used
 - Get evidence receipt whenever evidence transferred



MOST COMMON NAIS IN INTENTIONAL ABUSE

Blunt-force trauma

- Beatings, thrown against wall, kick, stomping
 - (often part of power-and-control dynamic in domestic violence)
- Conduct full-body radiographs to identify fractures at multiple stages of healing
- Shave fur to observe tell-tale injury bruise patterns that raise suspicion
 - e.g., matching dimensions of boot, hammer, baseball bat



EVIDENCE COLLECTION & PRESERVATION

Make evidence collection a priority

- Evidence that might be destroyed or deteriorate by time should be collected first
- Avoid contamination of evidence (wear cap, gown, gloves, mask, etc.)
- Store bodies in freezer or refrigerator for necropsy



MORE DETAILED FORENSIC STRATEGIES

More elaborate forensic methods adapted from human forensic cases may be part of the toolkit:

- Alternative light sources
- DNA analysis
- Toxicology
- Ballistics
- Entomology
- Blood spatter analysis
- Grave excavation

More specialized forensics may be required in:

- Dog/cock fighting
- Illegal hunting
- Ritualistic animal sacrifice

(Lockwood & Touroo, 2016)



MOST COMMON NAIS IN INTENTIONAL ABUSE

Sharp-force trauma

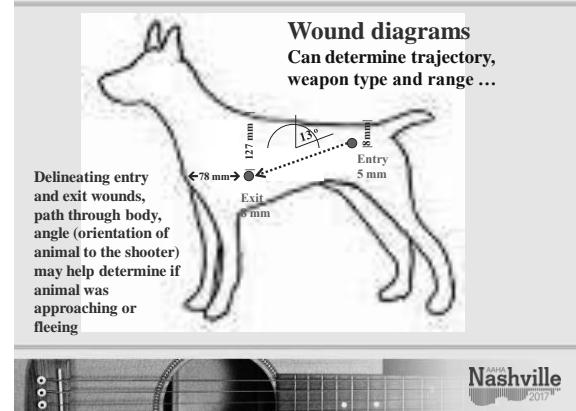
- Knives, axes, bite wounds, animal mutilation
 - (Match wounds to weapons found at scene)
- Include
 - Anatomical location of injury
 - Shape and depth of wound
 - Tissue characteristics and underlying structure
- Differentiate between human-caused wounds and natural predation
 - Predatory wounds:
 - Skin torn, not cut; wound edges not smooth
 - Hair around wound shows no sign of clean cuts
 - Typical bite wounds, presence of saliva



MOST COMMON NAIS IN INTENTIONAL ABUSE

Projectile Injuries

- Bullets, BBs, pellets, arrows, darts
- Injuries may not be externally visible
- Conduct full-body radiographs
- Recover evidence with care to avoid contaminating DNA, fingerprints or other evidence



MOST COMMON NAIS IN INTENTIONAL ABUSE

Strangulation and hanging

- Frequently co-occurring with IPV as way to frighten or intimidate
- Carefully handle and package all physical evidence: (ligatures, tape, rope may contain fingerprint or DNA evidence)

Drowning

- Difficult to determine: may be diagnoses by process of exclusion
- Other evidence and injuries to perpetrator may be present

MOST COMMON NAIS IN INTENTIONAL ABUSE

Burning

- Deliberate fire-setting a special bellwether
- Thermal injuries (*scalding, direct heat/fire*)
- Chemical injuries (*caustic substances*)
 - Document location, pattern, depth of wounds: may help determine if deliberate pour or accidental spill
 - Swab site and collect traces of accelerants (gasoline, kerosene, lighter fluid) and residues.
- Store evidence in airtight container.

MOST COMMON NAIS IN INTENTIONAL ABUSE

Poisoning

- Ingestion of toxins may be deliberate or accidental
- Most common cases: pesticides, fertilizer, prescription drugs
- Detail presence of toxins, medications, poisonous plants/animals at scene
- Analyze stomach contents, vomitus

MORE SPECIALIZED NAIS IN INTENTIONAL ABUSE

Organized abuse: dog/cockfighting

- Breed-specific
- Stereotypical injury patterns: facial/leg scars, puncture wounds, torn/amputated ears; torn feathers
 - Wounds in various stages of healing
- Suspicious situational evidence
 - Presence of fighting paraphernalia (treadmill, bite sticks, gaffs, pit)
 - Self-administered medications (steroids, iron supplements, antibiotics)



MORE SPECIALIZED NAIS IN INTENTIONAL ABUSE

Ritualized sacrifice of animals in religious or occult practices

- Courts have ruled sacrifice *per se* is OK as long as animal care and euthanasia are humane
- May involve sheep, goats, chickens
- Relatively rare phenomenon; primarily in Afro-Caribbean cultures
- Animal parts and collateral evidence may be found in public places (coins, notes, symbols)



Mercy Carrion, Santeria priestess, convicted on 3 counts of animal cruelty in Loudoun Co., VA, Aug. 2016, for failing to care for 3 roosters before sacrificing them.



MORE SPECIALIZED NAIS IN INTENTIONAL ABUSE

Animal sexual abuse

- Document evidence of any genital injury, especially trauma to anus, rectum, or vulvar/vaginal area
- UV light source (e.g., Wood's lamp) may cause semen stains to fluoresce
- Collect human/animal semen, seminal/vaginal fluids, epithelial cells, pubic hairs
- Full-body radiographs may uncover underlying injuries or evidence of violent restraint



THE VETERINARIAN IN COURT

Remember:

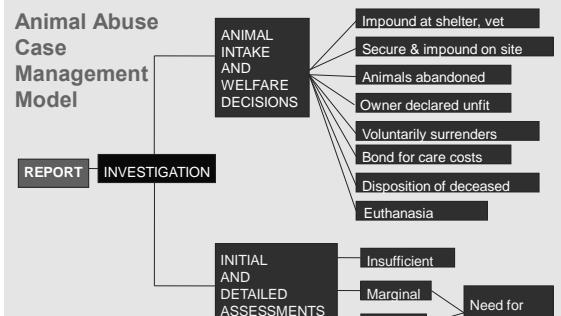
- You are an advocate for the truth
- Your duty is to provide fair, accurate, objective findings
- The good news:
 - DVMs generally perceived as trustworthy and admired
 - Prosecutors want to work with you
 - Veterinary forensics enhance a case's credibility
- The bad news:
 - Defense attorneys are adversarial and put you in uncomfortable, unfamiliar territory



MORE SPECIALIZED NAIS IN INTENTIONAL ABUSE

Animal sexual abuse

- Often defined in statutes as "bestiality," "detestable and abominable crime against nature," "unnatural acts"
- May be considered a sex offense, general crime, animal cruelty, or sodomy; proponents call it zoophilia
- Receiving increased attention:
 - Now illegal in 41 states
 - Human-animal contact invariably coercive: animals unable to consent
 - Often causes pain or death to animal
 - Increased links to human violence, especially child sexual assault



THE VETERINARIAN IN COURT: UNDERSTAND THE CRIMINAL JUSTICE SYSTEM

HOW THE CRIMINAL JUSTICE SYSTEM WORKS

- Allegation – *"complaint"*
- Investigation – law enforcement, humane agent
 - May depend upon DVM to establish credible evidence
- NOTE: *civil proceedings different*

CRIMINAL	CIVIL
State vs. defendant	Party vs. party
"Beyond a reasonable doubt"	"Preponderance of evidence"
Fines, incarceration, probation	Punitive/compensatory damages



THE VETERINARIAN IN COURT: UNDERSTAND THE CRIMINAL JUSTICE SYSTEM

HOW THE CRIMINAL JUSTICE SYSTEM WORKS

- *Probable Cause*: basic standard for filing charges
 - Definition: “more likely than not that crime was committed”
 - May involve act or omission
- Charging decisions: Prosecutor’s determination
 - Evidence, witnesses, statutes
 - Felony/misdemeanor
 - Strategy:
 - multiple collateral charges
 - case law
 - level of harm
 - culpability of defendant
- Grand jury: CYA in sensitive cases



THE VETERINARIAN IN COURT: UNDERSTAND THE CRIMINAL JUSTICE SYSTEM

HOW THE CRIMINAL JUSTICE SYSTEM WORKS

- Ongoing hearings (preliminary, bail, motions for discovery, change of venue, dismissal, continuances, etc.)
- May be *plea bargain*
- Trial – to court (“*bench*”) or jury
 - Court or jury (NOT you) is “*trier of fact*” – determines whether facts are believable beyond a reasonable doubt
 - Opening arguments
 - Prosecution & defense – direct examination, cross-examination, rebuttal
 - Closing arguments – defense always goes last
- Pre-sentence report/Sentencing



THE VETERINARIAN IN COURT: UNDERSTAND THE CRIMINAL JUSTICE SYSTEM

HOW THE CRIMINAL JUSTICE SYSTEM WORKS

- Who’s more credible: “expert” or lay witnesses?
 - Determined by each state’s Rules of Evidence
 - Professional, objective expertise vs. emotion
 - Hidden agendas?
 - Court/jurors will draw their own conclusions
 - Veterinary “halo effect”: positive image of protector of animals’ well-being
- Foundations for expert’s opinions:
 - Education, experience, training, credentials
 - Are facts accepted by others in the field?



THE VETERINARIAN IN COURT: UNDERSTAND THE CRIMINAL JUSTICE SYSTEM

HOW THE CRIMINAL JUSTICE SYSTEM WORKS

- *Prosecutor has “Burden of proof”*
 - To prove the case “beyond a reasonable doubt” (what a reasonable person would conclude solely from the evidence).
 - That situation was intentional, not accidental: “*mens rea*”
 - the intention or knowledge of wrongdoing, as opposed to the conduct of the accused.
 - “the act is not culpable unless the mind is guilty”
- *Defendant: Innocent until proven guilty*
 - Can plead not guilty, guilty or *nolo contendre*



THE VETERINARIAN IN COURT: UNDERSTAND THE CRIMINAL JUSTICE SYSTEM

HOW THE CRIMINAL JUSTICE SYSTEM WORKS

- Types of Expert Witnesses (called by prosecution or defense)
 - **FACT EXPERT**: direct and first-hand knowledge of the incident. Do not relay second-hand (hearsay) information.
 - **OPINION EXPERT**: qualified to offer an expert opinion based on education and experience.
 - **CONSULTING EXPERT**: hired by one of the litigants to aid in analyzing and evaluating a case. May or may not testify.



THE VETERINARIAN IN COURT: TESTIFYING AS AN EXPERT WITNESS

TIPS FOR TESTIFYING

- Advance Preparation
 - Meet ahead of time with prosecutors.
 - Alert them to any “landmines” (lack of experience, weaknesses) – *no surprises*
 - CV to describe your qualifications and publications
 - Bring your notes and documents: make sure prosecutors have everything
 - Ask prosecutor what questions you should expect and how you should prepare
 - Consult with an attorney if you have questions (*prosecutor is NOT your attorney*)



THE VETERINARIAN IN COURT: TESTIFYING AS AN EXPERT WITNESS

TIPS FOR TESTIFYING

- Advance Preparation
 - Familiarize yourself with courtroom in advance
 - Be prepared for changing dates
 - Keep a case status file with prosecutors' names and contact information
 - You have no obligation to speak with defendant's attorney or media apart from direct testimony and cross-examination



THE VETERINARIAN IN COURT: TESTIFYING AS AN EXPERT WITNESS

TIPS FOR TESTIFYING

- Your testimony
 - Explain your findings in medical language; be prepared to translate them into lay language
 - Distinguish between intentional and accidental acts
 - Describe reasonably prudent actions that could have been taken
 - May be limited to basic practice of veterinary medicine, or require more specialization
 - Pathologists, toxicologists, ballistics experts, certified animal behaviorists, industry- or species-specific experts, DNA analysts, etc.



THE VETERINARIAN IN COURT: TESTIFYING AS AN EXPERT WITNESS

TIPS FOR TESTIFYING

- Your testimony
 - Physical condition of all animals associated with the case
 - Changes in condition in response to care and treatment
 - Cause of death, sequence of injuries, timing of ante- and post-mortem wounds
 - Opinion on whether death or injury stemmed from human or non-human causes
 - Opinion on speed of unconsciousness or death, degree of suffering
 - Physical evidence that connects injuries to defendant



THE VETERINARIAN IN COURT: TESTIFYING AS AN EXPERT WITNESS

TIPS FOR TESTIFYING

- The day of the trial
 - Refresh your recollection about the case before testifying
 - Dress professionally
- Discuss with prosecutor whether the victim(s) may/should appear in court as well



THE VETERINARIAN IN COURT: TESTIFYING AS AN EXPERT WITNESS

TIPS FOR TESTIFYING

- Your testimony
 - Speak to the "*trier of fact*" (judge or jury), not to the questioner
 - Juries are lay persons: medical evidence adds credibility but MEGO
 - Be a teacher: explain the subject in lay terms but not condescendingly
 - Use visual aids
 - Show natural enthusiasm: demonstrates that you love what you do and know your subject



THE VETERINARIAN IN COURT: TESTIFYING AS AN EXPERT WITNESS

TIPS FOR TESTIFYING

- How to respond to questions
 - Tell the truth
- Demonstrate fairness and objectivity
 - Do not offer opinions on defendant's character
 - Express only the observed care or treatment of animals against what you would consider to be a reasonable standard for other clients or the community
- Be respectful of all parties
 - Don't argue, roll your eyes or interrupt
 - Present evidence with accuracy and integrity
- Answer ONLY what is asked



THE VETERINARIAN IN COURT: TESTIFYING AS AN EXPERT WITNESS

TIPS FOR TESTIFYING

• How to respond to questions

- Be confident about your testimony; it's OK to admit you do not know the answer or understand the question
- Refer to your notes
- If an attorney raises an objection, wait until the judge rules before answering
- Be prepared for rigorous cross-examination
 - Their goal: to unnerve you and plant seeds of doubt
 - If accused of being a "hired gun": explain fees charged are consistent, reasonable for rendering professional services, and not contingent on nature of the testimony



THE VETERINARIAN IN COURT

Common Defenses and Veterinary Responses:

- *"The animal was like this when I rescued it"*
 - Identify how long animal had been in defendant's care
- *"I'm not a hoarder: I rescue dying and hospice cases"*
 - True hospice providers provide adequate food, water and sanitary housing conditions
- *"The animal is a picky eater"*
 - Rule out medical problems that account for failure to maintain weight
 - Animal's feeding habits after medical care highly indicative
 - Measure weight gain daily or weekly following care

(Phillips & Lockwood, 2013)



OTHER FORENSIC CONCERN

What could happen if you don't report?

- May be a crime or perceived as aiding & abetting: check state law
- Prohibiting a staff member from reporting may be perceived as your having knowledge of, and condoning, suspected cruelty

• Can you get paid for your services?

- For investigations: probably. Check state law. Consider pro bono/discount/work with a nonprofit. Provide estimates for examination time, diagnostic tests, supplies, staff time, consultations, courtroom preparation, courtroom time and travel costs, cost of care of animal
- For testifying: yes. Check with prosecutor regarding reasonable professional fees.



THE VETERINARIAN IN COURT

Common Defenses and Veterinary Responses:

- *"It was an accident"*
 - Veterinary forensics can help distinguish accidents from NAI
- *"Someone else did it" (the SODDI defense)*
 - Veterinary forensics can link perpetrator to incident
- *"It was a mercy killing"*
 - Veterinary forensics can detail degree of animal's suffering
- *"It was self-defense"*
 - Size or temperament of animal may contradict this
 - Ballistics can determine if animal was attacking or fleeing

(Phillips & Lockwood, 2013)



OTHER FORENSIC CONCERN

Can you share client and patient documents?

- Check state law: probably allowed under court subpoena or search warrant
- Can charge reasonable fee for copying or summary

Can you be sued for filing a report?

- Check state law for absolute or limited liability



OTHER FORENSIC CONCERN

OTHER CONCERN

• How should you deal with the media?

- Defer to law enforcement or prosecutor – let them issue any statements
- Say you can't comment – an ongoing investigation
- Set protocols for staff regarding who may speak to the press
- Do not allow photos or other evidence to be released
- Do not give personal opinions in emails, as these may be subpoenaed



FORENSIC RESOURCES



- Evidence collection forms
- Body Condition Score charts
- Pain scales and guidelines
- Veterinary Diagnostic Laboratories

... and much much more!

www.AnimalFolksMN.org
www.NationalLinkCoalition.org



FORENSIC RESOURCES

Veterinary Forensic Sciences

Online Graduate programs

Non-Degree Course options:

Transfer up to 6 Credit Hours

- Veterinary Forensic Medicine
- Forensic Entomology
- Veterinary Pathology in Practice
- Forensic Applied Animal Behavior

Master's Degree and Graduate Certificate

- Master's Degree: (5 3-credit core requirements + 15 electives) 30 Credit Hours

- Graduate Certificate: (5 3-credit courses) 15 Credit Hours

<http://www.forensicscience.ufl.edu/veterinary/>



FORENSIC RESOURCES



IVFSA.org



ASPCA.org
CSI



IN CONCLUSION

“Animal maltreatment is one of the most challenging diagnoses in clinical work, requiring time, experience, emotional energy, sensitivity, tact, and not a small measure of courage. Such cases are invariably problematic and difficult to resolve....

-- Arkow, P. (2016). Recognizing and responding to cases of suspected animal cruelty, abuse and neglect: What the veterinarian needs to know. *Veterinary Medicine: Research and Reports*



IN CONCLUSION



“A proactive response has the potential to save human lives and reduce animal suffering. Veterinarians are ideally placed as sentinels and can be an essential part of public health to break the cycles of violence. In so doing, veterinarians can work within a One Health approach that unites human and veterinary medicine in common concern for the vulnerable, victimized and at-risk.”

— Arkow, P. (2016). Recognizing and responding to cases of suspected animal cruelty, abuse and neglect: What the veterinarian needs to know. *Veterinary Medicine: Research and Reports*

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