

Myths and Mistakes in Forensic Pathology

C.W. Leathers
October 28, 2005

You saw it on television; it must be true. [lame]
You read it on the internet; it must be true. [really lame]

The Nielsen's top ten rated television shows last week [October 17-23] were: CSI, Desperate Housewives, Without A Trace, Lost, CSI: Miami, Grey's Anatomy, NCIS, Fox World Series Game, Commander in Chief, and 60 Minutes.

Superficially, the similarities between hospital and medicolegal postmortem examinations would seem to make the two procedures identical twins; actually they are no more than cousins that happen to look alike.

Dr. C.S. Hirsch

A Dozen Myths, for Starters

1. Time of death can be determined precisely by examination of the body.
2. A necropsy always yields a cause of death.
3. A necropsy can be done properly without a history.
4. A necropsy is over when the body leaves the necropsy room.
5. Embalming will not obscure the effects of disease and trauma.
6. Only true and suspect criminal victims need to be examined.
7. The cause and manner of death are the only results of a necropsy.
8. Any pathologist is qualified.
9. The necropsy must be done immediately.
10. Poison always is detected by the toxicologist.
11. All veterinarians are good investigators.
12. Medico-legal investigation is criminally or prosecutorially oriented.

Another Dozen Myths

1. Identification of the cadaver (individual, species, genus, family) is easy.
2. Differentiating antemortem from postmortem wounds is easy.
3. Differentiating gunshot wounds from non-gunshot wounds is easy.
4. Differentiating entrance wounds from exit wounds is easy.
5. Trajectory of a bullet in the cadaver can be determined accurately.
6. Caliber of bullet (or even type of projectile) can be determined from entrance or exit wound.
7. The distance a bullet traveled from firearm to cadaver can be determined from entrance and exit wounds.
8. Recovery of a bullet from a cadaver is easy, even if the bullet is seen radiographically.
9. Specific microscopic identification of hairs, fibers, or other fragments is easy.
10. Confirmation of death by drowning is easy.
11. There is a test for all poisons, or all nutritional deficiencies and excesses.
12. DNA-based tests (or other genetic tests) are quick, simple, and cheap.

**A Dozen Mistakes
(as if the myths weren't bad enough)**

Most diagnostic errors are not the result of ignorance, but of haste, carelessness, or apathy.

Dr. A.C. Strafuss

It isn't a question of paper qualifications or certifications – these are satisfactory, but it's the person who counts The academic pathologist and staff hospital pathologist might be excellent in diagnosing the rare and unusual tumor of great importance to the patient, but they may also be menaces when let loose on a homicide autopsy.

Dr. Milton Helpern

1. The necropsy is incomplete.
2. Postmortem changes are not recognized, or are misinterpreted.
3. A mutilated or decomposed cadaver is considered unsuitable for necropsy.
4. External items (i.e., collars, bandages, tags, catheters, adherent debris, arthropods, seeds, leaves, bedding) are not examined adequately.
5. Objective findings are confused by addition of subjective statements.
6. The cadaver is not examined at the place it was found.
7. Photographic documentation is absent or inadequate.
8. A chain of custody actually is a frayed thread.
9. Toxicology samples are inadequate or handled improperly.
10. Careless errors are in the written report.
11. The person who performed the necropsy talks *too soon, too much*, and *to the wrong people*.
12. Interpretations of necropsy findings reflect intuition, rather than science.

If Called to Testify in Court

Time and again the lawyer goes single-mindedly for a “yes” or “no” answer to every question, a concept that is quite alien to anyone working in the medical or biological fields, where natural variation and a whole host of other variables make it impossible to give an unqualified answer to so many questions.

Dr. Milton Helpem

Most cases are settled out of court.

The chain of custody for collected evidence is most vulnerable.

Describe what was done; offer an informed (professional) interpretation.

Testimony is a teaching process; use it as such.

Use simple photographs and simple diagrams.

Leave the jargon at home.

The expert witness is not in court to root for one side or the other.

Animal Abuse

Investigating allegations of abuse is a complex interplay of law enforcement (police, humane officials, animal control personnel, social services workers) and veterinarians (in public and in private practice). Investigations may cross many jurisdictional boundaries.

Animal abuse and cruelty to animals are terms often used interchangeably, without clear or uniform definitions (lay, or medical, or legal).

Non-accidental injury is a preferable designation.

It is important to consider the (i) various types of injuries, (ii) presence of repetitive injuries, and (iii) multiple occurrences in the same household.

Exercise caution in connecting animal abuse, child abuse, and domestic violence.

Currently, no single injury, or groups of injuries, when considered in isolation from other circumstances of the case, can be taken as providing definitive evidence of non-accidental injury.

Dr. H.M.C. Munro

References General Topics

- Dix J, Calaluce R. **Guide to Forensic Pathology**, CRC Press, 1999.
(a concise, practical summary)
- DiMaio DJ, DiMaio VJM. **Forensic Pathology**, second edition, CRC Press, 2001.
- Dix J, Graham M. **Time of Death, Decomposition and Identification; An Atlas**. CRC Press, 2000.
- Dupras TL, Schultz JJ, Wheeler FM, Williams LJ. **Forensic Recovery of Human Remains**, CRC Press, 2006 [Distinguishing Nonhuman Skeletal Remains, pp. 161-182].
- Byrd JH, Castner JL (eds). **Forensic Entomology**, CRC Press, 2001.
- Haglund WD, Sorg MH. **Forensic Taphonomy; the Postmortem Fate of Human Remains**, CRC Press, 1997.
- DeHaan J. How to collect and preserve physical evidence. *Modern Veterinary Practice* 61:117-121, 1980.
- Rooney JR, Robertson JL. **Equine Pathology**, Iowa State University Press, 1996
[Forensics, pp. 378-387].
- Wade DA, Bowns JE. **Procedures for Evaluating Predation on Livestock and Wildlife**, Extension Publication B-1429, reprinted 1993, Texas Agricultural Extension Service [coyote, dog, fox, bobcat, cougar, black bear, golden eagle, raven, gull, hawk, vulture, raccoon, hog, rattlesnake].
- Stroud RK, Adrian WJ. Forensic investigational techniques for wildlife law enforcement investigations, (in) Fairbrother A, Locke LN, Hoff GL (eds). **Noninfectious Diseases of Wildlife**, second edition, Iowa State University Press, 1996, pp. 3-18.
- Wobeser G. Forensic (medico-legal) necropsy of wildlife. *Journal of Wildlife Diseases* 32:240-249, 1996.
- Adrian WJ (ed). **Wildlife Forensic Field Manual**, second printing, Association of Midwest Fish & Game Law Enforcement Officers, 1994.

References Gunshot Wounds

- DiMaio VJM. **Gunshot Wounds**, second edition, CRC Press, 1999. (probably the best book on the subject)
- Fackler ML. Wound ballistics; a review of common misconceptions. *Journal of the American Medical Association* **259**:2730-2736, 1988.
- Warlow T. **Firearms, the Law, and Forensic Ballistics**, second edition, CRC Press, 2005.
- Pavletic MM. Gunshot wounds in veterinary medicine: projectile ballistics – part I. *Compendium on Continuing Education for the Practicing Veterinarian* **8**:47-62, 1986.
- Pavletic MM. Gunshot wounds in veterinary medicine: projectile ballistics – part II. *Compendium on Continuing Education for the Practicing Veterinarian* **8**:125-136, 1986.
- Pavletic MM. Gunshot wound management. *Compendium on Continuing Education for the Practicing Veterinarian* **18**:1285-1299, 1996.

References Animal Abuse

- Munro HMC, Thrusfield MV. ‘Battered pets’: features that raise suspicion of non-accidental injury. *Journal of Small Animal Practice* **42**:218-226, 2001.
- Munro HMC, Thrusfield MV. ‘Battered pets’: non-accidental physical injuries found in dogs and cats. *Journal of Small Animal Practice* **42**:279-290, 2001.
- Munro HMC, Thrusfield MV. ‘Battered pets’: sexual abuse. *Journal of Small Animal Practice* **42**:333-337, 2001.
- Munro HMC, Thrusfield MV. ‘Battered pets’: Munchausen syndrome by proxy (factitious illness by proxy). *Journal of Small Animal Practice* **42**:385-389, 2001.