Preventing Errors in Death Investigation using Forensic Pathology Beyond the Autopsy

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- Diplomate of the American Board of Pathology
  - Anatomic & Forensic Pathology
- Over 35 years experience
  - Assistant medical examiner in St. Louis, Delaware, Philadelphia
  - Chief Medical Examiner State of Rhode Island
  - President, Forensic Pathology & Legal Medicine
  - Independent medicolegal consulting practice
Beyond the autopsy

• Analyzing all forensic evidence and facts of the case
  – DNA
  – Trace evidence
  – Ballistics
  – Toolmarks
  – Fingerprints
  – Surveillance video
  – Crime scene reports and photographs
  – Autopsy
Medical examiner’s office

• Autopsy done to professional standards
  – Photographs and X-Rays
  – Medical interventions
  – Histology
  – Toxicology
• Medical history
• Scene photographs
• Witness statements
Pathology expert

• Autopsy done by qualified, experienced doctor with license to practice medicine and board certified in forensic pathology

• “We see only what we know.”

- Johann Wolfgang Goethe
Six questions to be answered from examination of the body

1. Who is the victim?
2. When did the death and/or injuries occur?
3. Where was the scene; what were the circumstances?
4. What injuries are present?
5. Which injuries are significant?
6. Why & how were the injuries produced?

Charles C. Thomas; Springfield, IL
Beyond the autopsy

• Use the forensic pathologist’s training in clinical medicine diagnosis to analysis all the facts of the death investigation using

  – Inferential thinking or reasoning to develop a differential diagnosis
Using a medical model to prevent errors in death investigation

• Why do doctors in clinical medicine make mistakes?

• Answer: deductive reasoning

• What do they do about it?

• Answer: inferential reasoning
Deductive reasoning
(no differential diagnosis)

• Top-down logic given a fact or finding

• A conclusion based on a fundamental dictum known to be true

Finding
Deductive: top-down logic

- Patients with infection have high white blood cell counts
- My patient has a high WBC count
- Diagnosis: My patient has an infection
  - Start antibiotics; culture blood, urine, cerebrospinal fluid; place in isolation
Inductive reasoning (creates a differential diagnosis)

• Bottom-up logic
• Generates a list of possible ways a certain outcome could have been produced

Inductive reasoning generates ideas

Ideas as to possible causes

Finding

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Inductive reasoning: bottom-up logic

- Create a differential diagnoses
  - infection
  - leukemia
  - drug reaction
  - autoimmune disease
  - acute stress reaction

- How many ways could my patient develop a high WBC?

- My patient has a high WBC count
Case 1: child with abdominal trauma

Case sensitive material omitted for distribution
Case 2: Man with Stab Wounds

Case sensitive material omitted for distribution
Case 3: Death After Fight with Police

Case sensitive material omitted for distribution
Case 4: Naked Woman Dead on Ground Outside House

Case sensitive material omitted for distribution
Barriers to Inductive Reasoning

• Group think
• Bias
• Silos
• Premature closure
• “Wicked” problems
Work with the forensic pathologist at the beginning of the case

• Dismantle silos and share information

• Develop a list of differential diagnoses by using inductive reasoning

• Utilize targeted testing to get answers that are probative
Cases for Information Sharing and Inferential Reasoning: How else could it have occurred?

• Triage
  – High profile cases
    • Deaths of children and infants
    • Deaths in custody
    • Deaths of individuals of public interest
  – Complex cases with multiple data points or types of evidence