G87 19th Century Autopsy Techniques: Failing to Meet 21st Century Forensic Science Needs

O'Brian C. Smith, MD, and Teresa A. Campbell, MD, 381 Cherry Hollow CV, Cordova, TN 38018; Elayne J. Pope, MA, Department of Anthropology, University of Arkansas, Fayetteville, AR 72701; Chantal Ferraro, PhD, C.W. Post Campus, Long Island University, Brookville, NY 11548; and Alexandr Senilnikov, MD PhD, Regional Forensic Center, 1060 Madison AV, Memphis, TN 38104*

After attending this presentation, attendees will be familiar with diagnostic medical procedures applicable to death investigation in lieu of an autopsy.

This presentation will impact the forensic community and/or humanity by refining the autopsy selection criteria, which will allow greater opportunity for use of advanced clinical techniques and achieve a higher quality of report for use in adjudicated cases.

The autopsy hit its heyday in the 1880s due to the European masters like Rene Laennec, Rudolf Virchow, and Ambroise August Tardieu to name a few. Subsequent improvements to the autopsy include use of Roentgen's x-ray device, photography replacing artwork, and increased utilization of laboratory studies including microbiology and immunology. In contrast, some technologies, notably histology, have fallen into decline at many forensic facilities. Currently, Jurgen Ludwig's multiple editions on autopsy practices are the most modern compendium of pathology techniques derived purely for the purposes of demonstration and diagnosis. Yet the traditional autopsy still relies upon narrative styles little changed over the years, with the exception that comparing lesions to articles of food has been replaced by standard nomenclature and metrics. The pictorial style of autopsy reporting has been very difficult to incorporate, despite the truth of a picture being worth a thousand words. Pre-printed diagrams marked with short annotations are used by some and in this digital age, many photographs are still made using film technology, despite the instant feedback and proven advantages of digital imaging.

A wide variety of disciplines are incorporated at the autopsy table [anthropology, bloodstain pattern interpretation, trace evidence, and clinicians] to provide focal expertise ensuring no stone goes unturned. Expectations of the pathologists include being a physician with clinical skills. Pathologists should be adept at crime scenes, and clinical physical exams including the ability to read a 12-lead ECG, x-rays and other diagnostic images. They also need to be conversant with surgeons regarding resuscitation and surgical decision making. It is beneficial to remain current with the latest pharmaceuticals. The majority of continuing education, journals read and textbooks procured are of a clinical nature, from family practice to the surgicalandmedical specialties, pediatrics and OB/GYN. Significant additions to autopsy protocols include the following:

- Invasive angiographic studies
- Advanced x-ray protocols for child deaths following AAP guidelines
- Bronchoscopy and endoscopy
- Intra-peritoneal lavage
- Epiluminescence
- Supra-vital staining
- Cardiac conduction dissections
- Cytology of fluids, fine needle aspirates and touch preps
- Needle biopsy for tissue culture
- Needle biopsy for gross and/or histologic diagnosis
- *In situ* retinal evaluation
- Retinal recovery and histologic evaluation
- Histologic dating of wounds
- Histologic evaluation of wounds for foreign materials
- Evaluation/interpretation of bloodstain patterns on victims and clothing
- Excision and retention of bone fractures for fractural analysis and toolmarks
- Soft tissue and osseous burn pattern interpretation
- Digital narrative/pictorial public record autopsy protocol
- Privileged pictorial autopsy protocol
- Review by cultural anthropology

In the practice of pathology, the traditional autopsy tis a quaint expression of the best technology the 1880s had to offer. As with today's medicine, the practice of forensics has far more tools in its toolbox

 ** Presenting Author*

now than in the 19th century, mainly borrowed from clinical brethren. By using those tools and refining examinations with diagnostic procedures adopted from clinical colleagues, the percentage of persons needing autopsy to attain diagnosis has paralleled hospital autopsy experience and fallen to 14%. Because the new procedures with fewer autopsies save time, those most in need of autopsy; primarily homicides, child deaths and those too young to die, receive an Engineering Investigation quality autopsy averaging 12 hours of physician time per case. Thus, those cases requiring the highest standards of proof receive the greatest effort with the latest technology and the best reporting format.

Autopsy, Forensics, Pathology

 ** Presenting Author*