



Pathology Biology Section – 2011

G134 Transition to Digital in the Forensic Morgue: Lessons Learned on the Pathway to Greater Efficiency

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After attending this presentation, attendees will have a better understanding of the advantages of and obstacles to the transition to digital technology in the forensic morgue.

This presentation will impact the forensic science community by illustrating the advantages and elucidating the difficulties of the transition to digital fingerprint, radiograph, and photographic technology.

Maximizing efficiency in the postmortem examination process is critical to the daily operations of a busy medical examiner's office, and is also of particular importance to effective mass fatality preparedness planning. The Harris County Institute of Forensic Sciences (HCIFS) uses technology to maximize the efficiency and accuracy with which it can complete the autopsy process. These technological advancements include the acquisition of a digital radiograph system, a digital fingerprinting system, and digital photography. This presentation will detail the advantages of each of these technologies as well as the obstacles that complicated the transition to each. Generally, the most significant advantages of these technologies are increased efficiency, less waste, greater security, and enhanced user benefit. The most significant obstacles involve adaptation to the specific constraints and requirements of the medical examiner/morgue setting. There is little precedent for the use of some of these technologies in the medical examiners context, and this was reflected in our effort to adopt them.

The HCIFS completed its transition from conventional film radiography to digital computed radiography in December 2009. The digital system includes a central x-ray generator and digital processor, a dedicated server, and a web-based viewing software package that is accessible from each of seven autopsy suites, and from the doctors

(pathologists and anthropologists) office and laboratory computers. The advantages of the system include: greater image quality, more functional user interface (with contrast, brightness and annotation capabilities) multi-image split screen viewing, enhanced archival security, and the elimination of the expense, waste, and space requirements associated with film radiography. The most significant obstacles to the transition to digital x-ray technology were: the lack of an existing system that was appropriately configured for medical examiner use, the consequent development of user workflow, an unfamiliar user interface and image format, and training necessary for use of the software by non-radiologists/radiographers. Additionally, the HCIFS developed a means to copy, and label the images in a format that can be accessed by the Harris County District Attorney's Office.

Digital fingerprint technology has enhanced the efficiency of the decedent identification process. The HCIFS system is essentially an extension of the Harris County Sheriff's Office (HCSO) AFIS network, and includes six AFIS stations, each comprised of two types of fingerprint scanners and a 37" all-in-one touch screen computer. The fingerprints are transferred directly to the HCSO server rather than being stored at HCIFS, and HCIFS Investigations and Morgue staff utilize a custom web-based software interface to receive and search fingerprint results. The advantages of the digital fingerprint system include: increased print quality relative to the previous method; more efficient transfer of prints and receipt of results (five minute average turnaround); infinite upgrade-ability; and more secure archiving. The primary obstacles to the transition to digital fingerprint technology were: ensuring compatibility between the HCIFS system and the databases with which it communicates; lack of an existing system that is appropriately configured for medical examiner use, and; configuring and using a system that has not yet been tested elsewhere. The HCIFS is currently incorporating satellite based scanners into the system to facilitate use of the system by HCIFS Investigators in the field.

The HCIFS transitioned to exclusive use of digital photography at the both the scene and in the morgue in 2005. Conversion from film to digital photography has increased quality control and accessibility, while reducing processing and duplication costs. The system required the acquisition of digital cameras, a dedicated photo server and the infrastructure necessary to make use of the images in a variety of settings (the morgue, daily case triage meetings, case review sessions, and pre-trials). Secure remote access was provided to the district attorney's office eliminating time and supplies required for duplication. The most significant difficulty with the digital photography system is the ever increasing need for storage, and constant oversight is needed to ensure image security and reduce unnecessary image duplication.

The conversion to these digital systems has increased the efficiency of HCIFS daily operations and has resulted in a concomitant increase in its capacity to accommodate mass fatality investigations. Each of the systems was funded by preparedness grants awarded by the United States Department of Homeland Security



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and the transition process can serve as a template for other medical examiner jurisdictions.
Digital Fingerprint System, Digital Radiograph System, Digital Photography