E34 Comparing Resolution of Analog vs. Digital Imaging Systems in Postmortem Applications

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After attending this presentation, attendees will have an understanding of the advantages and disadvantages of analog and digital imaging systems and the practicality of each for postmortem radiography, particularly when high-resolution images are necessary.

This presentation will impact the forensic community by identifying the imaging methods and modalities that maximize the resolution of radiographic images.

Radiography is often an integral part of the postmortem examination, and high quality radiographs are essential. Goals of postmortem radiography include screening for the presence or absence of bony trauma and foreign bodies such as bullets or knife blades, determining the presence of air emboli, identifying the decedent, and determining accidental vs. non-accidental trauma. In the past, film was the only available recording media for radiographic examinations and limitations of analog systems often made it difficult to acquire optimal images. Presently, several types of recording media are available for both medical and postmortem radiographic examinations. Analog systems, also known as film-screen radiography, consist of intensifying screens contained within a cassette and film as a recording media. A significant advantage of analog systems is their unmatched spatial resolution. Unfortunately, a number of disadvantages exist such as the inability to manipulate an analog image once it is taken and sub-optimal radiographs needing to be repeated. Analog radiography requires an automatic processor and darkroom to convert latent to manifest images and maintenance of the film processor and chemistry is essential for optimum image quality. Film cost and storage space are considerations, as are the inability to store, transmit, or view analog images electronically without first digitizing them.

In addition to analog, two types of digital imaging systems exist: Computed Radiography (CR) and Direct Digital Radiography (DR) systems. Digital recording systems, both CR and DR, provide high-quality images while overcoming many of the limitations of analog systems such as the inability to manipulate the image and the need for a darkroom, processor, and storage space. Unfortunately, many digital imaging systems are unable to achieve the resolution of their analog counterparts. This presentation compares the resolution of skeletal survey and specimen images of several infants radiographed using both analog and CR imaging systems. Each radiograph was evaluated for visibility of recorded detail by a board-certified radiologist and a pathologist. This presentation will weigh the advantages and disadvantages of analog and CR imaging systems, identify the imaging methods and modalities that optimize image resolution, and discuss the practicality of each type of imaging system for its use in postmortem radiography.

Forensic Radiography, Image Resolution, Digital Radiography