W18 Improving Your Image: How to Get the Best Out of Your Expensive X-Ray Equipment

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After attending this presentation, attendees will: (1) have a better understanding of basic imaging principles using either film or a digital recording media; and, (2) incorporate these fundamentals into image optimization.

This presentation will impact the forensic science community by providing attendees with a better understanding of the association of basic radiographic principles, image acquisition, and optimization of image quality. The target audience for this presentation would include any individual involved in acquiring radiographs in a forensic setting. This would include, but is not limited to, medical examiners, forensic pathologists, dentists, anthropologists, autopsy technicians, and radiographers.

Medical imaging equipment and practices have advanced dramatically in the past two decades; however, due to the rapidly developing technology, many of the practices have not been adapted into forensics. The presentation delivery teams have had extensive experience in integrating technical advances with image optimization in a variety of settings including medical, anthropological, and forensics areas.

The Quinnipiac University Team has served as consultant to the Office of the Chief Medical Examiner for the State of Connecticut since 2002. During the academic semester, they not only radiographed victims but also trained the autopsy technicians on basic imaging fundamentals. Until the spring of 2014, all images were acquired using film, but since that date, the team has assisted in the transition to Computed Radiography (CR). In 2012, the team acquired valuable knowledge dealing with mass causalities from its experiences with the victims from the incident in Newtown, CT. In addition, the team has demonstrated alternative specimen imaging approaches utilizing industrial radiographic film, Multi-Detector Computed Tomography (MDCT), and tomosynthesis.

The Forensic Institute at Cranfield University/Inforce Foundation Team has extensive experience in delivering training in forensic radiography and mass fatality incidents. They deliver an annual Masters Level course for radiographers, anthropologists, and investigators and organize regular training and exercising for the United Kingdom Forensic Radiography Response Team. Team members have experience in routine Medical Examiner (ME) office work, cold case investigations, and many mass casualty incidents, including the 2007 London suicide bombings, Southeast Asia Tsunami, and investigations into genocide and human rights abuses in the former Yugoslavia, Sierra Leone, and Rwanda as well as in examination of archaeological remains. They provide advice on forensic imaging and emergency planning to the United Kingdom Government, United Nations International Criminal Court.

This presentation will begin with a general discussion of forensic imaging protocols that will include routine cases, cold case review, and mass casualty incidents in the United Kingdom and Connecticut. Although the use of film as an image receptor is declining, there are still locations where it is employed today. Several advantages of film will be discussed along with all the factors that must be considered with image optimization for this recording media, such as the formulation of a technique chart. In addition, the basic principles of film processing will be reviewed and will include consideration of automatic processing equipment and optimum operating conditions. An overview of the two types of digital image recording systems, direct Digital Radiograph (DR) and Computed Radiography (CR), will be reviewed. The advantages and disadvantages of each will be considered. Once the equipment basics have been discussed, the presentation will move on to methods and procedures to acquire images for routine and non-routine situations.

Forensic Radiography, Radiographic Film, Computed Radiography