



### A72 Cold Case Criminalistics: An Anthropological Approach to Cold Homicide Casework at the Boston Police Department Crime Laboratory

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After attending this presentation, attendees will be briefed on the complexities of cold case criminalistics and how collaboration between investigators, anthropologists, and criminalists has contributed to the successful evaluation and examination of cold case evidence at the Boston Police Department Crime Laboratory.

This presentation will impact the forensic science community by discussing the value of an interdisciplinary approach to cold case analysis to overcome the inherent challenges of missing documentation and degraded biological samples in an effort to expeditiously identify an aging suspect population in a modern crime laboratory; the implications of which contributes significantly to resolving investigations and successful prosecution.

In the United States, the definition of a backlogged case varies by jurisdiction, but has been defined by the National Institute of Justice as any case that has not been tested within 30 days of submission to a crime laboratory. Currently there is a considerable backlog of cold case homicides in the United States from the pre-DNA era. Federal grants, such as those offered by the National Institute of Justice DNA Backlog Reduction Program - Cold Case Initiative, provide eligible state and local authorities with additional funds to re-examine cold cases. Selection criteria for re-examination of cold cases include violent crimes where there is close contact and a significant potential for Locard's exchange of trace and biological material, e.g., homicide, rape/homicide, stabbing, strangulation and blunt force trauma.

Forensic anthropologists trained in taphonomy, trauma analysis, and human anatomy are particularly well-equipped to sequence events, distinguish between extraneous environmental modifications of human remains, and interpret patterns of evidence and biological materials associated with cold cases. In most areas of the country, forensic anthropologists work as consultants to local law enforcement as well as medical examiners' and coroners' offices to assist with the identification and/or recovery of skeletonized human remains. Forensic anthropologists are often asked to examine evidence without being present at the time of recovery or during transportation, autopsy, or testing. Careful examination of the condition and pattern of evidence is synthesized by the anthropologist along with photographs, case files, police reports, newspapers, and climate data to recreate the circumstances surrounding the time of death. Additionally, training in human gross anatomy and an understanding of biomechanics and trauma analysis are valuable in identifying and collecting aberrant biological materials from cold case evidence such as blood, semen, and other bodily fluids from a victim's clothing, especially when coupled with an autopsy report's description of the type, nature, location, and size of injuries sustained by the victim.

Criminalists investigating cold cases are similarly responsible for recreating the circumstances surrounding the time of death as well as understanding the taphonomic history of the forensic evidence since collection. This often involves researching internal institutional forensic documentation standards for collection, modalities for the retention and storage of evidence, documentation, testing practices, and understanding how these have changed over time. Additional information gathered from supporting agencies such as medical examiners' offices, hospitals and outside investigative service organizations can help locate evidence and reference samples and guide investigations. Another agency's commonplace practices - particularly practices in place prior to the field's understanding of and ability to use DNA evidence - may provide biological comparative or reference samples (e.g., slides, swabs, evidence, or blood) that were retained without extensive documentation. Finally, consideration of the type of biological material, as well as the medium, size, and estimated robusticity (given the taphonomic history) of the sample, should be considered prior to collection. A review of the literature and consultation with a DNA analyst should be part of the evaluation of the collection and retention of small samples from evidentiary items. Traditional criminalist screening methods for evaluating evidence should be amended to reflect the quality and quantity of a cold case sample.

The successful prosecution of cold cases is dependent on the ability to evaluate evidence and select the case specific DNA test that is most appropriate to conduct in light of the documentation available. A case series history from the Boston Police Department Crime Laboratory will be provided to illustrate some of these challenges.

#### **Criminalistics, Cold Cases, Forensic Anthropology**