W7   New Advances in Forensic Human Identification. Issues and Approaches

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Learning Overview: After attending this presentation, attendees will have a heightened understanding of: (1) the factors affecting human identification; and (2) how the application of new, innovative, and cross-disciplinary techniques have the potential to overcome these issues, which will be detailed through case examples.

Impact on the Forensic Science Community: This presentation will impact the forensic science community through the presentation of multidisciplinary approaches toward human identification, pointing out the novel techniques suitable for this purpose, encouraging collaboration and innovation among different forensic specialties to document and integrate several lines of evidence.

Human identification always has been a complex task; the degree of complexity, however, is highly dependent on the context in which death occurred. Phenomena such as the human mass migration and displacement witnessed in the past years add challenge, such as an increased difficulty in tracing an individual's geographical origin, thus complicating antemortem data and reference sample collection.

The traditional identification approaches of forensic anthropology and odontology, as well as their advantages and limitations, will be covered before delving into the introduction of new forensic procedures. Additionally, challenging cases of human identification will be presented, and step-by-step approaches on how to tackle them from different disciplines will be delivered.

Time frame and geographical origin of the remains are crucial data to achieve a positive identification of the unknown. New advances in microbiota characterization can provide insights about the time-since-death; additionally, the analysis of radiocarbon can offer important information regarding when the individual was born and died. The estimation of a fingerprint's age can provide valuable information that can help relate an individual temporally in a certain location.

Geographical origin can be established by isotope analysis, also providing information about the diet of the deceased.

New trends in forensic genetics point out the use of Small Nucleotide Polymorphisms (SNPs) to determine eye and hair color and ancestry, leading to a facial approximation based on genetic traits. In the past years, 2D and 3D imaging techniques have been developed and have been very useful in forensic science, especially for comparison of postmortem and antemortem images, and several of these techniques will be demonstrated.

This workshop will further cover the topic of appropriate documentation and temporary disposition of unidentified remains in order to maximize the potential for future identification.

All these new and innovative methods will help forensic scientists create the biological profile of human remains and achieve a positive identification.

This workshop will demonstrate how the awareness of the problems faced in human identification and thinking out-of-the box and applying and integrating new techniques with traditional procedures are essential to facilitate the correct identification of the victims. This is particularly important in mass disaster scenarios, where the large number of deceased pose challenges to this task as human remains are often incomplete, commingled, and sometimes only fragmentary remains are present. Such complexities require comprehensive approaches and new tools that contribute to obtaining different lines of evidence to positively identify the deceased. Thus, this workshop will provide a step toward finding solutions to these complications by improving the knowledge on the most state-of-the art procedures available to forensic identification.

Human Identification, Multidisciplinary Approach, State-of-the-Art Forensic Technique