## H24 Resolution of Cold Cases: A Multidisciplinary Approach to Identifying Remains Previously Interred as Unknown

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After attending this presentation, attendees will gain strategies for using a multidisciplinary approach to resolve cold cases.

This presentation will impact the forensic science community by providing knowledge and methods for employing a multidisciplinary approach to resolve cold cases, particularly when DNA analysis is not available.

The Joint POW/MIA Accounting Command Central Identification Laboratory (JPAC-CIL) is charged with conducting global search, recovery, and laboratory operations to identify unaccounted-for Americans from past conflicts in order to support the Department of Defense's personnel accounting efforts. During the 1950s, the remains of deceased service members from the Korean War were processed through the Central Identification Unit (CIU), Kokura, Japan, in order to establish identity; however, 867 sets of remains were determined to be unidentifiable and were buried as "Unknown" with full military honors at the National Memorial Cemetery of the Pacific (NMCP) in Hawaii. In preparation for interment, the remains were subjected to postmortem chemical processing that, in turn, has affected DNA recovery. As part of the JPAC mission, CIL historians and analysts review case files (originally generated by the CIU) for each set of remains interred as "Unknown" to determine cases where new technology or information produces a high likelihood of identification. The CIL has yielded a high success rate in identifying unknown remains from the Korean War, despite problems with DNA analysis. This is accomplished by employing a multidisciplinary approach, utilizing military historians, anthropologists, and odontologists during the research and analytical phases. Analysts associate individuals with unknown remains through a combination of extensive archival research into loss locations and dates, recovery locations and dates, POW movements, and review and re-analysis of the anthropological and odontological information present in the files. Following exhumation of the remains, laboratory scientists conduct anthropological and odontological analyses. Since DNA analysis cannot currently be utilized for these cases, the CIL relies on comparison of the circumstantial information, biological profile, dental information, chest radiographs, and photographic superimposition to support a positive identification for these remains.

To date, 34 unknown graves from the Korean War have been exhumed from the NMCP and re-analyzed at the CIL by analysts "blind" to information on these cases. These analyses have resulted in the sorting of 37 individuals, of which 24 have been positively identified. Post-identification, the biological profile generated by the staff at the CIU in the 1950s, was compared to the biological profile produced by the CIL anthropologists (current analysis) in order to refine the methodology of associating individuals with unknown remains. In addition, both biological profiles were compared to the actual biological profile of the identified individual. From these analyses, several trends have appeared in the data: the CIU age ranges only captured the actual age of the individual 50% of the time. In regard to the ages that were not captured, 75% were overestimated in age. The CIL age ranges, in comparison, captured the actual age 96% of the time. The CIL age ranges were, on average, wider than the CIU age ranges, which may account for some of the error. Stature estimates produced at the CIU yielded a 26% accuracy, with an almost even distribution of cases being overestimated (47%) and underestimated (53%) in stature; whereas the CIL prediction interval for stature captured the actual stature in 96% of the cases. The low percentage generated by the CIU stems from narrow prediction intervals, which in some cases were point estimates. Race was correctly assessed in 87.5% of the CIU case notes and in 100% of the CIL forensic anthropology reports.

The data collected from the cases of unknown individuals who are now identified aids in the refinement of analyses, archival research program, and efforts of associating unaccounted-for individuals with remains that are buried as unknown. Continued development of background research and advances in forensic science increase the ability to identify remains previously interred as unknown.

**Cold Case, Identification, JPAC-CIL**

 ** Presenting Author*