

The author(s) shown below used Federal funds provided by the U.S. Department of Justice and prepared the following final report:

Document Title: Novel Computer-Assisted Identification Method Using Radiograph Comparison

Author(s): Sharon M. Derrick, Ph.D., Jennifer C. Love, Ph.D., Jason M. Wiersema, Ph.D., John A. Hipp, Ph.D., N. Shastry Akella, Ph.D., Jim Zeigler, Ph.D.

Document No.: 248511

Date Received: November 2014

Award Number: 2010-DN-BX-K194

This report has not been published by the U.S. Department of Justice. To provide better customer service, NCJRS has made this Federally-funded grant report available electronically.

Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

analysis, previously expensive but currently offered at no charge through the President's DNA Initiative (15), has a turnaround time historically measured in months.

Literature Review:

Establishing medicolegal decedent identity typically relies on DNA, dental comparison, or fingerprints. However, a family reference sample may not be available for comparison. Lack of antemortem dental care and/or records may preclude the analysis of dental characteristics. Fingerprinting may not be possible when the hands are in an advanced stage of decomposition, traumatized, or scavenged by carnivores, and many individuals do not have fingerprints on record. When computerized fingerprint comparison through the Automated Fingerprint Identification System (AFIS) is unsuccessful, latent examination by an analyst may be requested if there are latent fingerprints available for comparison. However, recent research suggests that cognitive or confirmation bias may play a role and adversely affect the comparison of dental radiographs and latent fingerprint comparisons, which may lead to evidentiary challenges (16-20).

When DNA, dental comparison, and fingerprint analysis are unsuccessful, the ME/C may request radiographic comparison of skeletal elements conducted by an analyst with specialized training, such as a forensic anthropologist, a forensic radiologist, or a forensic pathologist (21). Radiograph identification, performed through a point-by-point comparison between similar antemortem views of a missing person and postmortem views of a decedent, is a non-destructive method that does not expose the practitioner to biohazards beyond routine manipulation of the body. The analyst typically undertakes identification analysis by qualitative comparison of skeletal elements in antemortem and postmortem radiographs, evaluating the radiographs for

