



### F56 The NAS Report, Forensic Odontology, and a Path Forward

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After attending this presentation, attendees will learn the basis of the National Academy of Sciences (NAS) Report, its findings as it relates to forensic odontology, and recommendations for the science going forward. Attendees will learn from some critical analysis of bitemark research as well as the limitations of the NAS Report as it applies to the criminal justice system.

This presentation will impact the forensic science community by exposing some of the specifics of the NAS Report as it relates to bitemark evidence that will impact the direction of research in this field. Competence in analyzing a pattern injury in both live and experimental bites will be enhanced so errors of the past will not be repeated.

The NAS Report was published in 2009 entitled, *Strengthening Forensic Science in the United States: A Path Forward* and authored in part by a “committee on identifying the needs of the forensic science community.” This comprehensive white paper covered all the fields of forensic science and did a critical analysis with recommendations for improvement going forward. Specifically in the field of forensic odontology, the focus was on the area of bitemarks. At the NAS hearing in 2007, Dr. David Senn was the only presenter representing forensic odontology. He spoke specifically about bitemark evidence. The area of basic research in the forensic odontology field was covered with the acknowledgement that more needed to be done. To date, the majority of bitemark research has been conducted with the use of a mechanical device applying a “pseudo bitemark” on non-living human tissue (cadaver bites). While these findings as they apply to cadavers are accurate for a mechanical bite, the study is academic when applied to mechanical bites on living volunteers and very misleading when real teeth are used in a real life violent battery during an assault or homicide. The NAS Report divided the forensic science fields into two major categories.

The first area is “analytical” which has been referred to as hard science and includes fields such as DNA, chemical analysis of materials such as paint, gunshot residue, chemicals, materials such as fibers, fluids, serology, fire, and explosive analysis.

The second area is “pattern/experience” evidence and has been referred to as “soft evidence” and includes such things as fingerprints, fire arm examination, tool marks, bitemarks, blood stain patterns, handwriting, hair, impressions (tires, foot wear), etc.

The path forward for all the forensic fields as pointed out in the NAS Report includes, but is not limited to, the following: peer review of cases (supervisor review) before trial; proficiency testing on a regular basis; and, board certification by an accredited board. Indeed, the Report mandated board certification before one could be considered an expert and provide testimony at trial.

The American Board of Forensic Odontology (ABFO) has addressed these recommendations in whole and in part with the updating of their standards, guidelines, and recommendations for analysis, reporting, and recertification, specifically as it relates to bitemarks. The path forward for forensic odontology in the field of bitemark analysis will be researched on “real life” cases, such as cases that have been adjudicated and cases that have been proven by witness observation and peer review by appellate court decision in order to be on a sound scientific basis. Critical review by a second or even a third expert before an opinion is proffered is now part of the protocol. The area of recertification, proficiency testing, and improved requirements for board certification have and are being addressed. Improvements in the field of bitemark analysis and bitemark comparison have been addressed by the ABFO; the NAS recommendations have been and are being implemented, so the path forward is progressing.

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#### Bitemarks, Odontology, Analysis