



G14 Construct Validity of Bitemark Assessments Using the ABFO Bitemark Decision Tree

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The goals of this presentation are to help attendees understand both the nature of agreement with respect to decision making and the importance of construct validity in the assessment of bitemarks.

This presentation will impact the forensic science community by informing attendees that bitemarks are currently under considerable scrutiny from judicial and scientific communities and by providing the result of an assessment of 100 injuries to determine the degree of agreement.

Since the criticisms within the 2009 National Academy of Sciences Report, Strengthening Forensic Science in the United States: A Path Forward, bitemarks have been an area of odontological practice that continue to be under considerable scrutiny.

The American Board of Forensic Odontology (ABFO) has developed a decision tree to help odontologists navigate the assessment, analysis, and conclusion levels that should be applied to bitemarks. The first portion of the decision tree is to assess a patterned injury to determine if it is a bitemark, suggestive of a bitemark, or if biting can be excluded as a cause. If the injury is determined to be a bitemark, then the next step is to determine if individual arches and tooth marks are identifiable within the injury. Following this, the decision tree goes on to assess the analysis and comparison of the injury.

This research study was concerned with the first two stages of the pathway — if these are not reliable or valid then the rest of the decision tree is rendered invalid. In order to assess the level of agreement using the decision tree, the following was undertaken: 100 injuries, comprised of suspect bitemarks and other patterned injuries, were presented, using a web-based system, to ABFO diplomates. Each image set included at least one scaled and one orientation image. No contextual information was provided. Respondents were asked to rate each image as either a bitemark, suggestive of a bitemark, or not a human bitemark. For those responses where the injury was determined to be a bitemark, an additional question was asked concerning the identification of individual arches and tooth marks.

In total, 39 diplomates completed all 100 questions out of 103 diplomates contacted. As there is no established reference standard for these data, a modal approach was adopted with percentage agreement established between the respondents. Data will be presented on the each of the decision elements, including the dichotomous decision to render an opinion, the three options for stating if the injury was a bitemark, and the level of forensic significance associated with the injury.

Bitemark, Agreement, Reliability