



### F33 Gate-Keeping, Bite Mark Evidence, and Research: Out of Adversity Comes Opportunity

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After attending this presentation, attendees will be aware of the potential problems with gate-keeping in forensic science, be cognizant of the pitfalls of peer review, and learn a new algorithm as an approach to bite mark cases that lends itself to the development of testable hypotheses to buttress or refute various steps in the bite mark analytical process.

This presentation will impact the forensic science community by explaining the reason that present peer review and judicial gate-keeping are pillars of the post-*Daubert* era. Current standards of terminology in bite mark cases are based on consensus opinion rather than hard science. Peer review in journals is fallible and neither guarantees truth nor quality. Judges, charged with gate-keeping for the most part have little science background. In this milieu the National Institute of Forensic Science has recommended terminology be standardized for bite mark cases. An alternate algorithm for processes in bite mark analysis is presented that lends itself to the design of evidence-based approaches to bite mark recognition and analysis, and provides alternate, appropriate, accurate, under-stated terminology, that better reflects the level of current science in this field.

*Daubert v. Merrel-Dow*, a non-unanimous Supreme court decision made judges, few of whom have science backgrounds, the gate-keepers of whether an expert or his testimony is suitably scientific for presentation to the trier of fact. In turn, in jury trials the common man must assess scientific or pseudo-scientific testimony, often with no scientific background. This gate-keeping function of judges is partially predicated on assessment of methodology that has been subject to peer review and published in, presumably, reputable journals that have their own, peer-review processes fraught with potential error. Recent external pressure has justifiably focused a microscope on bite mark analysis as one area of endeavor that requires clear standardization of technique, testing of error rates, and reporting of findings that reflect the science of bite mark analysis as it presently stands. A change in the way that forensic dentists approach bite mark cases can readily address these new, improved requirements and also provide opportunities and direction in the way that future research projects can be developed. Current terminology, though standardized, does not reflect scientific knowledge in the field. Presently, terminology attesting to whether a given patterned injury is a bite mark or not is not a dichotomous one. This allows an injury to be diagnosed as suggestive of a bite mark. Despite these reservations there is nothing to prevent a forensic dentist from carrying on with a “suggested” bite mark and attributing it to the dentition of a suspect. Additionally, despite demonstrations by several authors, there are many bite marks that are diagnosed as such, yet because of their low evidentiary value, do no merit further comment. A revised approach also provides the forensic dentist options to make a diagnosis of a bite mark but not proceed with a complete work-up because the evidence does not warrant one. Further, in testimony and communication with judges and juries the forensic dentist should use language that accurately reflects what is known in the field and more importantly what is not known. Finally in light of a recommendation about clear and non-confusing testimony a less-adversarial, less accusatory, more accurate, and understated means of attributing a given dentition to a suspect dentition is proposed.

The proposed a system is as follows:

1. Is the injury a bite mark? Yes or No
  - a) The patterned injury present is a bite mark.
  - b) The patterned injury present is not a bite mark.
  - c) The material available for review is insufficient for a decision to be made.
2. What is the evidentiary value of the bite mark?
  - a) The evidentiary value of data available warrants further investigation.
  - b) The evidentiary value of data available does not warrant further investigation.
3. Results of comparisons to suspected dentitions:
  - a) The suspected dentition can be excluded as having made the bite mark.
  - b) The suspected dentition cannot be excluded as having made the bite mark.

#### **Bite Mark, Gate-Keeping, Terminology**