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## G16 Lip Prints: Inter-Rater Reliability

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After attending this presentation, attendees will recognize the similarities and differences in lip print analysis and appreciate the need for rater calibration methods for reliability.

This presentation will impact the forensic science community by demonstrating the error rate in an inter-rater reliability test for the analysis of lip prints.

Lip prints and their study, cheiloscropy, have been the topic of research and are also occasionally mentioned in literature by a detective, a crime scene investigator, or an examiner in another field of evidence comparison.<sup>1</sup> Subject comparisons have been recorded in the thousands. Research studies on lip prints have been contributed mainly by forensic dentists and anthropologists in countries throughout the world.

Literature and studies claim the uniqueness of human lip prints.<sup>2,3</sup> Investigations may be able to rely on lip prints to identify possible suspects or to support evidence gained in investigations. A standard and uniform procedure has been put forth for the analysis of lip prints. The need to develop one cohesive cheiloscropy system, practicable in forensic dentistry, has been published as the one defined by Tsuchihashi in 1970.<sup>4,5</sup> This method is published in the 2013 American National Standards Institute/National Institute of Standards and Technology (ANSI/NIST) revised dental standard ITL-1-2011.<sup>6</sup>

The legal community demands a reliable method of analysis and reliable experts to interpret patterns. This study sought to identify the amount of inconsistencies regarding the practice of lip print analysis, the results of which would determine the need for rater calibration. To prove the evidential value of lip prints in a court of law, a standard and uniform procedure has to be developed for the collection, development, and recording of lip prints and the ensuing comparison. The practice of analyzing lip prints is in the infant stage. Forensic odontologists are novice at it and have very little, if any, experience in the practice. Dentists with other forensic experience analyzed sets of lip prints using lip photos and prints recorded on paper. The results reveal the need for practice, experience, and further research to gain a status of reliability in the forensic community.

Many conclusions can be questioned when critical appraisal skills are applied, as in the calibration of examiners and also the inconsistency of methodologies in recording and analyzing prints. Establishing that the metric can be used consistently and reliably is attempted in this study. A consensus of uniqueness of lip prints must be reflected in the quality of the research and the number of prints analyzed to contribute to determining uniqueness. In addition to this study, more quality-designed studies using forensic professionals in the analysis of lip prints are needed. This further research of lip prints analysis should continue with the goals of meeting the *Daubert* standard and validating its usefulness in forensic identification for applicable legal matters.

### References:

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### Lip Prints, Cheiloscropy, Inter-Rater Reliability