B46 A Validation Study of Physical Associations of Duct Tape Ends

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By attending this presentation, attendees will learn how a study to evaluate the validity of conducting physical associations (endmatches)we designed and administered. Although we looked at duct tape, a common consumer item submitted to forensic science laboratories, the study can be used as a model to evaluate other materials (such as glass, wood, metals, paper) submitted to forensic laboratories. The results of the study can be used by other forensic science laboratories that conduct end-match examinations on tape to support their test results in court challenges.

This presentation will impact the forensic community by demonstrating that although tape end-match examinations have been conducted in forensic science laboratories for decades, there are no published validation studies on this technique. Presentation at this conference will be the first opportunity to inform the forensic community of the results of the study. The design and administration of the test will be presented so other laboratories may use the study as a model to evaluate other types of materials commonly submitted to forensic science laboratories for physical association (end match) examinations such as metal, wood, glass, etc.

Although tape end-match examinations have been conducted in forensic science laboratories for decades, there are no published validation studies on this technique. In the era of Frye and Daubert where a forensic examiner must demonstrate to the court the scientific soundness of their examinations, we undertook a study to address this concern.

The purpose of the study was to determine the validity of conducting physical association (end match) exams on duct tape evidence and to evaluate the error rate associated with such an examination. The study was also designed to address the following: the number of associations/end matches identified correctly and incorrectly; the ability to identify associations/end matches for both torn and cut pieces of duct tape; and whether the grade of tape influences the ability to identify associations/end matches.

Three rolls of duct tape were used, representing different manufacturers and grades of tape. Each participant received five sample sets, three sets with hand-torn ends and two sets with scissor cut ends.

The sample sets were prepared as follows: ten (10) strips of each tape were either cut or torn and adhered sequentially onto a plastic surface. Each strip of tape was randomly labeled alphabetically and then numbered sequentially (1-10) on the plastic surface to which the tape was adhered. Each test set was digitally documented and the order of tape within each test was verified by a second person. The pieces of tape were then separated from one another by cutting the plastic substrate. The substrate was cut in such a way to remove the sequential number and so that end-matching of the substrate was not possible. For each test set, the ten (10) strips of tape were shuffled together and three (3) strips were randomly removed. The three (3) randomly removed strips were placed into a properly labeled plastic bag. The remaining seven (7) strips were placed into individual plastic bags and labeled appropriately.

A total of 20 sample sets were administered to four analysts with directions to evaluate whether or not physical associations (end matches) existed among the strips of tape in each set following the standard operating procedure.

The results of the initial study were evaluated by the test administrator. In cases where there was a failure to report a physical association by the original test participant, the test set was evaluated independently by the three remaining test participants and each rendered their opinion.

The results of this study will be presented in detail addressing each of the aforementioned objectives. Discussion will include the number of correctly identified tape end-matches, whether the manner in which the tape is separated (hand-torn versus cut with scissors) and whether the grade of tape has an effect on the ability to conduct these examinations.

Duct Tape, End-Match, Validation Study

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