



B127 An Evaluation of Materials for Documenting Injuries From Blunt and Sharp Implements

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Learning Overview: The goal of this presentation is to provide forensic science practitioners with a direct comparison of materials used in making impressions for documenting injuries from blunt force and sharp instruments. This presentation equips forensic scientists with cost-benefit insight that may help them in deciding which materials may be most suitable to use in different circumstances, given access and availability.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing attendees with insight into different materials that can serve investigations in areas where expensive materials may not be accessible. This presentation will enhance their ability to evaluate alternatives when silicon-based impression materials are not an option, unavailable, or do not fit the needs of the forensic scientist.

Collecting and preserving tool mark impression evidence is critical for forensic autopsy. This evidence is often used to identify weapons used in homicide as well as to demonstrate the cause of death in legal settings. Medical examiners must use impressions to determine the mechanism of an injury and to identify the weapons used to cause those injuries. While the collection and preservation of evidence is an important part of field forensics, there is tremendous variation in the cost and variability of materials to make these impressions.

This investigation provides forensic science practitioners with a direct comparison of materials used in making impressions for documenting blunt force and sharp instrument injuries. This study tested the hypothesis that there are less expensive and easier-to-obtain materials that are just as good as expensive materials in documenting pattern injuries from blunt and sharp implements. The methodology used four implements to test across three different materials. The three different materials were: AccuTrans™ Casting Silicone (\$135 for 10oz), Polyform Model Air by Polyform Products, Inc. (\$12.49 for 16oz), and Mold Putty by Alumilite Corporation (\$26 for 10.58oz). Each implement was tested in different dimensions and orientations. The substances were impacted and then photographed with measurements taken and changes documented over time. The differences in measurement and aesthetic appearance were calculated and compared via photography. Measurements were taken daily for the first week, then again on day 14 and day 21. The results showed that all tools and material compounds showed variability in the first seven days. The data revealed that stable measurements could be obtained for all materials after two weeks when little variability was seen in any of the materials.

Based upon the data, the AccuTrans™ Casting Silicone provided the most stable and consistent measurements with low variability for some blunt force and sharp instruments. Inspection of the molds also showed extra detail on the AccuTrans™ Casting Silicone and the AccuTrans™ Casting Silicone appeared to be the most consistently accurate impression material overall. Surprisingly, the much less expensive Polyform Model Air was almost as accurate and showed the same low variability after two weeks. The results indicate that the AccuTrans™ Silicone Casting is best suited for small surface areas as it can be difficult to use to record large or multiple injuries.

This study reveals that while expensive materials for making impressions documenting blunt force and sharp instrument provide the most stable and consistent measurements, much less expensive materials perform almost as well, depending on the injury impression required. The less expensive material could be particularly useful for blunt force or sharp instrument injuries covering a large area or where the impressions across a large area need to be made in proximity. Finally, this investigation provides attendees with insight into different materials that can serve investigations in areas where expensive materials may not be accessible. This study enhances the ability to evaluate alternatives when expensive impression materials are not an option, unavailable, or do not fit the requirements for measuring the injuries presented because of mitigating circumstances or cost concerns.

Impression Materials, Blunt Instrument Injury, Forensic Molds