



### **B124 Examining the Effects of Mishandling of Gun Shot Residue Evidence**

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The goal of this presentation is to highlight the possibility of misinterpreting gun shot residue evidence if the material is collected or transported improperly.

The presentation will impact the forensic community by elucidating the difference between several packaging methods for gun shot residue evidence, indicating which methods yield more accurate results.

Gun shot residue (GSR) evidence is often submitted to the laboratory for interpretation. Typically the distance from the muzzle of the firearm to the garment is in question. The traditional method of analysis is to visually examine the garment and assess the overall pattern density of the particulates present. Because GSR is composed primarily of small particles of unburned and partially burned propellant, the ability of the particles to be retained by the garment will affect the pattern density at the time of examination.

There are several methods of collection, storage and transportation that can be used for GSR evidence. The method chosen, however, may have a profound effect on the interpretation of the pattern if the particles become dislodged during this process. Typically, if a considerable number of the particles become dislodged prior to the evaluation of the sample, the interpretation would suggest that the muzzle was further away from the target than it actually was. This could be a critical piece of information in a case where self-defense is claimed.

This research considers several different packaging/transportation methods to determine which might lead to inaccurate conclusions.

Several identical substrate T-shirts have been shot at known distances, resulting in GSR patterns. These have been scanned into a computer for objective pattern density analysis using digital imaging software. The digital method of analysis can allow for a more objective and quantifiable means of comparison between exemplars and questioned garments. It can also clarify how the method of packaging affects the results of distance determinations. This resultant data has been stored for later evaluation. After scanning, some of the samples were "properly" handled and some were "improperly" handled. The scanning results were compared and evaluations of the various methods were made, identifying the best and worst methods tested.

**Gun Shot Residue, Mishandling, Evidence**