B155 A Study on the Persistence of Gunshot Primer Residue on Clothing Subjected to Handling

Christopher P. Chany, MS, Texas Department of Public Safety, Austin HQ Crime Laboratory, Trace Section, 5800 Guadalupe Street, Bldg U, Austin, TX 78752; Thomas R. White, BS, Texas Dept of Public Safety, Austin Crime Lab, 5800 Guadalupe Street, Austin, TX 78752; Sandy Parent, BS, PO Box 4143 - MSC 0460, Austin, TX 78765; Juan A. Rojas, BS, Texas Dept of Public Safety, Austin Crime Lab, 5800 Guadalupe Street, Austin, TX 78752; and Lyndsi DeLaRosa, MS, Texas Dept of Public Safety, Austin Crime Lab, 5800 Guadalupe Street, Austin, TX 78752*

After attending this presentation, attendees will better understand the persistence of gunshot primer residue on clothing.

This presentation will impact the forensic science community by providing attendees with an insight into the dynamics of gunshot primer residue particle transfer on clothing. This presentation describes the methods used to artificially create the transfer of gunshot primer residue from one item of clothing to another and provides the results of this study.

Gunshot primer residue is produced by a firearm when it is discharged. The primer for centerfire cartridges is composed of lead styphnate, barium nitrate, and antimony sulfide. The residue from the primer explosion escapes from openings in the gun and can be deposited on a person's hands and clothing. These particles can be collected and analyzed using automated scanning electron microscopy energy dispersive X-ray. Characteristic gunshot residue primer particles have a molten appearance and are composed of barium, antimony, and lead. During a crime scene investigation, evidence technicians may package an item of clothing that has gunshot primer residue on it in the same evidence container as other items of clothing from the crime scene. While studies have been conducted as to how long gunshot primer residue persists on a living person's hand, studies have not been conducted about how long it will persist on clothing that is subjected to handling, such as packaging as evidence. Additionally, it has also not been determined whether gunshot primer residue easily transfers from one item of clothing to another item of clothing with which it may come into contact.

This presentation will detail the results of a study using a controlled mechanism for the transfer of gunshot primer residue from one item of clothing to another.

Gunshot primer residue was placed on clean cloth swatches of different types of clothing materials to create positive gunshot primer residue samples. Clean cloth swatches were then packaged with the positive gunshot primer residue cloth swatches in the same manner that samples are received in the laboratory. The cloth swatches were then subjected to different types of handling to mimic real-life conditions. The surfaces of the clean cloth swatches were then sampled using standard gunshot primer residue collection stubs. Those stubs were analyzed using scanning electron microscopy energy dispersing X-ray spectroscopy instrumentation using standard laboratory procedures for the analysis of gunshot primer residue.

This research takes a novel approach by investigating the likelihood of gunshot primer residue transfer between articles of clothing.

Gunshot Residue, Evidence, Scanning Electron Microscopy