MEGAN COLLINS and MARK FLOOD, Forensic Science Program, Fairmont State University, Fairmont, WV 26554. Analysis of gunshot residue (GSR) transfer to various items.

The purpose of this research was to determine if the secondary transfer of gunshot residue, or GSR, to non-porous items such as a cellphone or doorknob was detectable with a field testing kit. To test this, three different guns, a handgun, shotgun, and an automatic rifle were fired, each by a different person to ensure there was no cross contamination between the guns. The shooters then touched one of four items. These items, a key, a cellphone, a doorknob, and a pair of sunglasses, were swabbed and tested for GSR using a field kit that utilized a diphenylamine and sulfuric acid solution to test for nitrates and a sodium rhodizonate solution to test for the metals commonly found in GSR, primarily lead and barium. A control was also done, where the diphenylamine/sulfuric acid and sodium rhodizonate solutions were applied to an alcohol swab that had not come into any contact with GSR. Three of the four items had fairly consistent GSR transfer that was detectable with the field kit. The key gave mostly negative results, which was probably due to the size of the key. In conclusion, the GSR field kits were mostly successful in the detection of the secondary transfer of GSR. However, it seemed as though a larger concentration of GSR was needed on the shooters hands in order for enough to be transferred and detected. Future research should be conducted to determine if different ammunition types would result in different amounts of GSR.