B10 Evaluating the Success of DNA Analysis and Latent Print Examinations on Submitted Firearms

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After attending this presentation, attendees will be informed regarding statistical data compiled from casework performed at the Iowa Division of Criminal Investigations Criminalistics Laboratory involving latent print examinations and DNA analysis of firearms evidence.

This presentation will impact the forensic science community by encouraging attendees to draw conclusions from the presented data that may alter or change methods and/or procedures regarding submitted firearms evidence at their laboratories across the country.

A request for multiple examinations on firearms evidence has become more and more common across the country. The development of latent prints has been a reliable method of human identification for decades, while touch DNA is a newer investigative tool that is employed in forensic casework. Latent print examinations date back to the early 20th century, while touch DNA dates back to 1999 in the United Kingdom and 2003 in the United States. Nationwide, laboratories have seen approximately a 10%-15% success rate with both latent print examinations and touch DNA analysis on firearms. Other studies have confirmed that latent print and DNA methods have even lower success rates on ammunition.

This presentation analyzes the types of cases that were submitted to the Iowa Division of Criminal Investigation Criminalistics Laboratory. Included are 104 closed cases from 2015 in which firearms evidence was submitted in addition to requests for analyses other than traditional firearms testing. First, cases were sorted into the type of crime that was committed (crimes against a person, weapon offenses, drug related crime, and property crime) and the type of request (latent print examination, DNA analysis, or both) beyond the firearms examination. Of the 104 cases, it was found that 58% were subjected to latent prints only, 26% to DNA only, and 16% had both examinations performed. Crimes against people constituted 45% of the total cases; property crimes had the least amount of case submissions.

One hundred pieces of firearms-related evidence were sent for latent print examination. The majority of the evidence was either a pistol or a magazine from a pistol. Fifty latent prints were developed, and 39 were considered suitable for identification on 24 firearms. This resulted in a 24% success rate. Blood was found on eight firearms and one bullet; the DNA analysis resulted in nine complete profiles suitable for identification, resulting in a 100% success rate for DNA analysis on blood-related firearms evidence. Sixty-seven swabs from 41 firearms and four ammunition types were analyzed for touch DNA. Of these 67 swabs, 11 profiles resulted in the identification of a person, providing a 16% success rate for touch DNA analysis. The most common outcome was a mixed DNA profile that was too weak to interpret. This result was seen nearly 50% of the time.

This research suggests that similar studies be performed over several years to determine if the rate of success is maintained and also to determine if the percentages are consistent in a larger data set. Studies like these are imperative since there is an increasing demand nationwide regarding turnaround time due to backlogs; therefore,

laboratories need to be aware of and use the most efficient identification methods available.

Latent Prints, DNA, Firearms