



### E35 The Impact of Gunshot Residue in Military Investigations and Legal Proceedings

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After attending this presentation, attendees will have a general understanding of how gunshot residue (GSR) is used in military investigations and legal proceedings, the usefulness of gunshot residue evidence in criminal cases and suicide investigations, and an understanding of some of the caveats that come along with gunshot residue.

This presentation will impact the forensic science community by providing a solid foundation as to the use of gunshot residue in military investigations and trials, and providing a catalyst for more research in GSR analysis.

According to Michael Trimpe, from the *FBI Law Enforcement Bulletin* in 2011, gunshot residue (GSR), like most trace evidence, is not conclusive but supportive and circumstantial.<sup>1</sup> Supportive evidence can only take an investigation so far and the continuing controversy on the usefulness of GSR examinations brings about the debate of how important GSR examinations are to an investigation and/or legal proceedings. Garcia suggested in *The American Journal of Forensic Medicine and Pathology* in 2007 that the results of GSR examinations were crucial to medical examiners but very little has been done to show what it means to investigating agents.<sup>2</sup> Since the initiation of the Innocence Project, there have been several outcome studies that try to identify links and commonalities in criminal investigations/judicial proceedings in an effort to reduce the number of convicted innocent people.<sup>3</sup> Based on the effectiveness of these outcome studies and the circumstantial nature of GSR examination, it is necessary to determine the overall effect that these examinations have in the military system.

This retroactive outcome study started with 154 cases involving a gunshot residue kit that had been sent into the United States Army Criminal Investigation Laboratory (USACIL) since 2008. Cases were collected from all of the military branches. Of those, 68% of the cases were made up of suicide investigations. The remaining 32% were criminal investigation that involved murders, assaults, and negligent discharge crimes. Even fewer of these ever make it to a judicial proceeding. The forensic information for each case was drawn from the laboratory information management system (LIMS). This information included GSR examination results, case synopses and other pertinent data (rank, location, weapon type, contact numbers). Once all the applicable data was obtained, investigators, defense, and trial counsel were questioned regarding cases that had GSR kits submitted for examination. The questions asked of the agents and attorneys were used to gauge the overall impact of gunshot residue in their investigations and legal proceedings. A rating scale was developed at the end of the study to group responses based on how they used the examination reports. This placed a quantitative value on qualitative data. Statistical data was also determined using a Chi-Square model including items such as interviews before and after the results were released and sentencing outcomes for criminal cases.

The conclusion drawn from the investigative study was broken into two categories: suicide investigations and criminal investigations. Using the rating scale developed from the responses of the investigators, it was inferred that GSR results in suicide investigations had minimal to no impact 84% of the time. The impact of gunshot residue in criminal investigations was contrary to suicide investigations. The results showed that 87% of criminal investigations were impacted in some manner from gunshot residue results. The GSR examination results came back inconclusive on 13% of cases in which the investigators stated there was no impact from gunshot residue.

Most of the attorneys that utilized GSR results in legal proceedings stated that it was a part of the package that was used to either get a conviction or exoneration. There were two cases where the attorneys stated they didn't even look at the results and a few others saying they looked but decided against using it. One attorney said that the results were a big piece in negotiating a plea agreement.

Based on the research thus far, the impact of gunshot residue in military investigations is still circumstantial. However, based on the trends identified in this study, gunshot residue has significantly more impact in criminal investigations than in suicide investigations. Analyzing the data for legal cases reveals that most of the attorneys would like to see more research into the subject or at the very least, see it continue to be used with better training provided to investigators on how to collect GSR kits leaving less room for error in analysis. A decision cannot be made based solely on this study due to the quantity of data collected, but the trend shows that it would be worth looking into the possibilities of making GSR exams more specific before determining if it is still needed.

\*The opinions or assertions contained herein are the private views of the author and are not to be construed as official or as reflecting the views of the Department of the Army or the Department of Defense.

#### References:

1. Trimpe, Michael. "The Current Status of GSR Examinations." *FBI Law Enforcement Bulletin* May 2011: 24-32. Print.
2. Molina, D. Kimberley, Michael Martinez, James Garcia, and Vincent J. M. DiMaio. "Gunshot Residue Testing in Suicides." *The American Journal of Forensic Medicine and Pathology* 28.3 (2007): 187-90. Print.



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- <sup>3</sup>. West, Emily M. *Court Findings of Ineffective Assistance of Counsel Claims in Innocence Project*. Sept. 2010. Web. June 2011.

**Gunshot Residue, Military Investigation, Legal Proceedings**