



B172 Do We Understand the Factors That Influence Fingermark Detection?

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Learning Overview: After attending this presentation, attendees will have an improved understanding of the variety of factors that affect the detection of a latent fingermark. The goal of this presentation is to provide an up-to-date review of the factors influencing fingermark detection and how these can be determined and studied.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing information to address a current knowledge gap and by encouraging the community to appreciate the complexity of this area. This presentation will: (1) assist researchers in fingermark detection to undertake more robust research; and (2) assist practitioners to be more proficient through a better understanding of the fundamentals of latent fingermarks when implementing detection methods in casework.

The primary aims of fingermark detection research are to improve the quality and number of recovered fingermarks. This is usually performed through the development of new methods and technologies to provide alternatives to or improve current procedures. While research of this nature is important to pursue, it fails to address the underlying question related to the factors that affect the detection of a latent fingermark. There has been significant research that has examined the differences between techniques, donors, and fingermark age, as well as the composition of latent fingermarks. However, previous research tends not to focus on determining how these factors influence the quality of the developed mark.

A previously published study found that substrate characteristics and fingermark donor inter- and intra-variability play major roles in the number and quality of marks developed.¹ Based on the findings of this initial study, there is still more research required to understand the fundamentals of latent fingermarks and their detection. This presentation will provide an update on the continuing investigations being performed to better understand the factors that influence fingermark detection, focusing on the second phase of the study using a larger donor population under more realistic conditions. The discussion will cover a number of related areas, including: (1) the influence of substrate chemical and physical characteristics on the development of fingermarks, and (2) the influence of the donor on the detection process, particularly cyanoacrylate fuming on plastic substrates. In both phases of the study, a greater donor dependency was observed for cyanoacrylate fuming than for indanedione-zinc.

It is argued that such research provides much-needed information to address the current knowledge gap. It also encourages the forensic science community to appreciate the complexity of this area. The findings from this study assist researchers in fingermark detection to undertake more robust research. For example, these findings provide guidance when developing experimental design by taking donor/fingermark composition and substrate characteristics into consideration, in particular for positive early studies. These findings also assist practitioners to be more proficient through better understanding the fundamentals of latent fingermark detection processes when implementing these methods in casework, including validation and refinement of Standard Operating Procedures (SOPs).

Reference(s):

- ¹ Chadwick, S., Moret, S., Jayashanka, N., Lennard, C., Spindler, X., Roux, C. Investigation of some of the factors influencing fingermark detection. *Forensic Science International*, 2018, 289, 381-389.

Fingerprints, Detection Techniques, Fingermark Compounds