A64 The Effect of Cyanoacrylate Fuming on DNA Recovery From Post-Deflagrated IEDs

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After attending this presentation, attendees will learn about the pros and cons of cyanoacrylate fuming shrapnel from deflagrated pipe bombs as it affects subsequent DNA isolation and analysis.

This presentation will impact the forensic science community as it is not currently known if cyanoacrylate fuming is advantageous for later DNA isolation by helping to retain cells on the fumed item or disadvantageous due to interference with subsequent DNA analysis.

Previous research has shown that it is possible to generate handlers' DNA profiles from post-deflagrated improvised explosive devices (IED). This is beneficial as fingerprints rarely survive the heat and flame of the deflagration. However, it is still standard practice to send IED components to trace evidence and latent print units for examination. During this process, the components are often cyanoacrylate fumed in an effort to enhance any latent prints. If no prints or other individualizing evidence is found, the components may be sent to the DNA unit in an attempt to recover cells shed by the assembler of the device.

Earlier studies on producing DNA profiles from deflagrated IEDs and/or components associated with them (e.g., triggering devices, packaging) have been increasingly successful. However, those items were not fumed or otherwise preprocessed, as they typically would be in a crime laboratory. To examine what effect cyanoacrylate fuming might have on DNA analysis from IEDs, 24 pairs of pipe bomb components (steel end caps and one foot lengths of one inch steel pipe) were handled by volunteers. The bomb pairs were then assembled and filled with smokeless powder by members of the Michigan State Police bomb squad. The bombs were deflagrated under controlled conditions and the fragments from one of the pair members was cyanoacrylate fumed on site,

while the other was left unfumed.

The fragments were then placed in a brown paper bag, sealed, and returned to the Forensic Biology Laboratory at Michigan State. DNA was

isolated using the double swab technique, using six pairs of swabs (two per end cap and two per pipe). DNA was quantified using QuantiFiler and amplified using MiniFiler. Consensus profiles were generated based on results from all six pairs of swabs, the accuracy of which was then determined based on buccal swab profiles for each volunteer. Taken together, the results show what effects cyanoacrylate fuming has on DNA recovery and analysis from deflagrated IEDs and whether it should or should not be performed if DNA analysis may be undertaken.

DNA, Improvised Explosive Device, Cyanoacrylate Fuming

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