

BODY FLUID IDENTIFICATION AND DNA PROFILING AS A TOOL FOR THE FORENSIC NURSE

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The term “crime scene” typically calls to mind images such as a ransacked apartment or a decomposing body in a field. But, can we also think of urine-soaked bedsheets or blood-spattered floors in a long-term care facility as crime scenes? Could they contain forensic evidence that would help determine if abuse has taken place? Research has shown that elder mistreatment has become sufficiently prevalent in our society to constitute a major public health concern. In fact, results from large-scale studies have identified the rate of abuse in the elderly population (60 years or older) as ranging from 7.6-11% nationwide, and rising annually. This abuse can have far-reaching negative effects on the physical, psychological and financial aspects of the victim’s life. The application of forensic analysis techniques may help in the identification and collection of evidence in cases of abuse and aid in the reduction of such incidents.

We investigated the potential efficacy of applying the body fluid identification and DNA profiling techniques common in the practice of forensic science to the detection of blood, saliva and urine stains that may be indicative of elder mistreatment in settings such as long-term care facilities. Body fluids were serially diluted to simulate the natural loss of sample with the passage of time after deposition and spotted on cotton/polyester sheets. Presumptive testing allowed us to not only identify the location of potential stains, but also to analyze patterns. Further testing confirmed the identity of the body fluid, and DNA profiling associated the donor with a reference sample.

Presumptive testing was performed using the Phadebas® Forensic Press Test (saliva), luminol (blood) and an alternative light source (urine). Testing resulted in successful location and pattern analysis of samples diluted to 1:10 to 1:100 for saliva, 1:100 to 1:1000 for blood and 1:10 for urine. Confirmatory testing (RSID™ Saliva, RSID™ Blood, UriTrace® Urine) was generally more sensitive by an order of ten. Dilutions as low as 1:1000 (saliva) and 1:10,000 (blood) successfully supported DNA profiling, while analysis of urine samples was less successful. These results suggest that the use of forensic body fluid identification and DNA profiling techniques can aid in the investigation of elder abuse.