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## F7 Transfer and Persistence Expert Evidence in the Canadian Criminal Trial Process

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**Learning Overview:** After attending this presentation, attendees will better understand how Gun Shot Residue (GSR) evidence and DNA transfer and persistence evidence have been interpreted and used by non-scientist justice system participants in the Canadian criminal trial process.

**Impact on the Forensic Science Community:** Canadian criminal trials are neither videotaped nor televised, and expert forensic witnesses are generally not present during times when their evidence is summarized and argued, such as in opening and closing statements by lawyers or in judges' instructions to the jury or rulings from the bench. Experts, therefore, are generally unable to determine how their evidence is actually used in the trial proceeding in real time. This presentation will impact the forensic science community by relating the purpose of this research, which was to determine whether in-trial statements from lawyers and judges regarding the expert testimony in DNA or GSR transfer and persistence, made during the absence of the expert, were accurate.

Relevant cases were targeted by searching selected keywords in the Lexus Advance Quicklaw and the Canadian Legal Information Institute (CanLII) public databases. Trial documents were obtained from the Ontario Court of Appeal Records Office in Toronto, Canada, where files already contain full transcripts for criminal appeal purposes. Qualitative coding of transcript testimony was performed by locating those transcript statements relating to the transfer or persistence of DNA or GSR, comparing those statements to the experts' statements, then assessing and categorizing the statements as accurate or not. In particular, transposed conditional statements were highlighted, as were instances of lawyers proffering transfer and persistence inferences without expert input.

While too few cases (ten) were analyzed for statistical purposes, general trends were noted. For the majority of the GSR cases, lawyers ignored most of the limitations presented by scientists when referring to the expert evidence. Among the legal system trial participants, judges were the most accurate in summarizing the expert evidence. Approximately 80% of the expert scientific opinions on GSR transfer and persistence were presented in the form of the Probability of the Hypothesis (P(H|E)), rather than in the form of the Probability of the Evidence (P(E|H)), and without explicitly stating competing hypotheses. For DNA cases, where experts refrained from commenting due to a lack of empirical knowledge, lawyers seemed prompted to do so themselves. This resulted in instances of unsubstantiated claims put forward to the judge or jury. In terms of accuracy, both lawyers and judges showed strengths in discussing and arguing body fluid identification statements, but weaknesses in discussing and arguing negative results. These incorrect reflections seemed to stem from a lack of understanding of the meaning of the absence of DNA on evidence.

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**Transfer, Evidence, Expert**