## G110 Laboratory Variation and Postmortem Redistribution in the Interpretation of Postmortem Fentanyl Levels

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After attending this presentation, attendees will understand the principles of postmortem redistribution and interlaboratory variation and how to best utilize those concepts when evaluating postmortem fentanyl levels in central and peripheral samples.

This presentation will impact the forensic science community by providing an understanding the importance of using caution when interpreting very small, quantified fentanyl levels in postmortem samples.

The concept of postmortem redistribution has been extensively studied in some drugs, such as amitriptyline. The concept has also been looked at in regards to fentanyl, which due to its transdermal delivery mechanism, has interesting and unique pharmacokinetics and likely undergoes postmortem redistribution. It is hypothesized that fentanyl levels drawn from peripheral samples in the field, hours before autopsy, would be significantly lower than fentanyl levels in peripheral and central blood samples drawn at autopsy.

For this study, ten cases had fentanyl levels drawn in the field by investigators. The fentanyl level in this sample was compared to the level of fentanyl in peripheral and central samples taken at autopsy 15- 24 hours later. Fentanyl levels are measured in very small quantities, ng/ml. At these very small amounts, the standard laboratory error could also greatly impact the values reported by the laboratory. In the process of comparing field and autopsy specimens and autopsy peripheral and central samples, we also sent most samples to a second accredited forensic toxicology lab. The ratios between the field and autopsy specimens and the heart and femoral blood levels were compared, and the interlaboratory variation was evaluated as well.

The spearman correlation coefficient was similar (0.41) for the field and autopsy specimens from as single case analyzed at laboratory #1 as the coefficient for a single heart blood sample run at laboratory #1 and laboratory #2 (0.62) and a single autopsy peripheral blood sample run at laboratory #1 and laboratory #2 (0.57). Thus, the variation in values was similar between the same specimen analyzed at two different laboratories and between samples drawn from different sites and at different times. Other evaluations of the heart:femoral blood ratio of fentanyl and measurements of correlation and variation will be discussed.

**Fentanyl, Postmortem Redistribution, Interlaboratory Variation**

 ** Presenting Author*