



F36 Analysis of Drug Paraphernalia in a Wrongful Death Case

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The goals of this presentation are to: (1) describe the case facts; (2) explain the use of Direct Analysis in Real Time Triple Quadrupole linear ion Trap/Mass Spectrometer (DART® QTRAP®/MS) platform for drug confirmation from drug paraphernalia; and, (3) understand how this technology may aid forensic analyses and investigations.

This presentation will impact the forensic science community by introducing novel methods to identify drugs associated with paraphernalia recovered at the scene of a death. The information from the analysis can be used and interpreted by forensic toxicologists, pathologists, and attorneys to aid in wrongful death litigation.

Hypothesis: It is suspected that in addition to injecting an oxycodone solution, the decedent also injected the residue obtained from her fentanyl patch.

Statement of Content/Methods: The patient was admitted to a community hospital for renal and gastrointestinal issues. According to the medical records, the patient was prescribed a 75 microgram/hour fentanyl patch, hydromorphone, and promethazine. Promethazine was administered intravenously through a Peripherally Inserted Central catheter (PIC line). The patient was found dead, locked in the bathroom of her hospital room. Drug paraphernalia (syringes and pills) were located near the body and the syringe contained a pink residue; the fentanyl patch was not located. At autopsy, changes in the lungs consistent with Intravascular (IV) drug use were noted and toxicology specimens were collected. Both drug paraphernalia and toxicology specimens were sent to the University of Alabama at Birmingham Forensic Toxicology Laboratory for analyses. The drug paraphernalia included: a prescription bottle of pink pills labeled 10mg oxycodone, one needle containing dried powder, three syringe barrels (two 10mL capacity and one 1mL capacity), and a medicine cup containing a white glue like substance. Postmortem toxicology specimens analyzed included peripheral blood and urine. Toxicology analyses were performed on the decedent's samples using Enzyme Multiplied Immunoassay Technique (EMIT), Gas Chromatography/Mass Spectrometry (GC/MS), and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). The drug paraphernalia were rinsed with methanol and analyzed by EMIT and DART® QTRAP®/MS.

Summary of Results: Postmortem toxicology results in the peripheral blood included: ethanol-negative, promethazine (0.473mg/L), hydromorphone (0.009mg/L, fentanyl-0.011mg/L), and oxycodone (0.090mg/L). Drug paraphernalia EMIT results were positive for opiates (300ng/mL cutoff) for the needle and the two 10mL capacity syringes and positive for oxycodone (300ng/mL) for the needle and all three of the syringe barrels. Confirmation analysis was performed on the five samples via DART® QTRAP®/MS in enhanced product ion mode (EPI mode). The acceptance criteria included peak area exceeding three times signal-to-noise, acceptable library match (minimum fit quality of 75%) obtained for two of the three samplings, acceptable negative control (blank sampling device) and acceptable positive control (certified reference material). Fentanyl was detected in the needle, one 10mL capacity syringe (#1) and the plastic medicine cup wash. Oxycodone was confirmed in both 10mL capacity syringes (#1 and #2). Hydromorphone was not detected in the drug paraphernalia.



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Conclusion: The manner and cause of death were determined to be accident and fentanyl toxicity, respectively, with contributing factors of oxycodone and hydromorphone use. From the DART® QTRAP®/MS results for the drug paraphernalia, it is clear that the patient not only self-administered unauthorized medication but also circumvented the designed route of administration for the prescribed medication, fentanyl.

DART® QTRAP®/MS, EMIT, Wrongful Death