K35 You Don't Look/You Don't See: Delayed Death Due to Suboxone Ingestion Involving Analysis of Alternate Non-Biological Specimens (Clothing) – The Cleveland Experience

Elizabeth K. Balraj, MD, Eric S. Lavins, BS, and Curtiss L. Jones, MS, Cuyahoga County Coroner's Office, 11001 Cedar Avenue, Cleveland, OH 44106; Lee M. Blum, PhD, NMS Labs, Inc., 3701 Welsh Road, Willow Grove, PA 19090; and Deborah Y. Shaffer, BS, Laura D. Wilkins, BS, Mohammed Sarwar, PhD, and Frank P. Miller III, MD, Cuyahoga County Coroner's Office, 11001 Cedar Road, Cleveland, OH 44106*

After attending this presentation, attendees will have a better understanding of the utilization of alternate non-biological specimens (clothing and fabric) in addition to traditional matrices (blood, urine, bile, vitreous humor, gastric) as part of the death investigation process. Utilization of clothing or relevant material is important when biological specimens from the time of death are not available.

This presentation will impact the forensic science community by reminding attendees to think outside of the normal paradigms of toxicological analysis of only utilizing biological specimens from the body or from hospital admission. In this case, the decedent survived more than a month in a coma and antemortem specimens from the drug incident were not available for analysis. Alternate non-biological specimens (clothing) impregnated with drugs from urine and vomitus were utilized as the nexus needed in clarifying the cause of death.

In 2008, a 24-year-old white female was found unresponsive at her home by her family. That evening she entered her home and asked her sister to make her a cup of tea. The sister then retired for the evening. The decedent was last seen to be seated in a chair in front of a computer. When she came into the house that evening she told her sister that she had smoked marijuana, took SuboxoneÒ and drank 3/4 of a can of beer.

The next morning she was found unresponsive on the floor next to the chair. The previous day she was in the accompaniment of a friend outside of the home. She was conveyed to the hospital with an initial diagnosis of anoxic encephalopathy secondary to possible drug overdose. The decedent had a history of drug and ethanol abuse and depression. Heroin, Suboxoneâ, and alprazolam were suspected in the overdose. She remained in an unconscious state and died approximately one month later.

An autopsy was performed at the Cuyahoga County Coroner's Office, Cleveland, Ohio. Postmortem blood: heart and femoral, urine, vitreous humor, bile and gastric were submitted for a comprehensive toxicology analysis. The initial post-mortem toxicological analysis produced a paucity of information. The blood was positive for Oxycodone 1.85 mg/L, Acetaminophen 41.9 mg/L, Diazepam 0.16 mg/L and Nordiazepam 0.08 mg/L. Fluconazole and Oxymorphone were reported as positive. All of these drugs were administered during her hospital stay. No antemortem admission blood samples were available for reanalysis. Hospital admission urine toxicology only revealed the presence of benzodiazepines, testing for Suboxoneâ was not conducted.

The family had retained the clothing that the decedent was wearing on the morning she was found. They provided to law enforcement a pair of underwear, a hooded sweatshirt and a cushion cover on which she was last seen to be seated. Previous studies have demonstrated the ability to isolate various drugs from the fibers of textile fabrics. The decedent had vomited on her sweatshirt and had urinated when she was found unconscious.

From these materials, swatches of the stained areas were cut and subjected to a comprehensive Toxicology analysis. The initial Toxicology screens of the clothing and seat cushion cover were positive for fluoxetine and caffeine, respectively.

Further testing by liquid chromatography with tandem mass spectrometry (LC-MS/MS) on the stained fabric extracts for non- routinely covered drugs was performed at NMS Labs, Willow Grove, Pennsylvania. The underwear and sweatshirt were positive for alprazolam, naloxone, buprenorphine, and norbuprenorphine. The seat cushion swatches were "negative."

In 2002 the FDA approved Suboxoneâ to treat opiate addiction. It contains Buprenorphine and Naloxone and has both analgesic and opioid antagonist properties. Suboxoneâ may dangerously increase the effects of drug-drug interactions; this includes some antidepressants, antihistamines, benzodiazepines, sedatives, analgesics, antianxiety, and muscle relaxants. Coma and death has been associated with the concomitant intravenous misuse of buprenorphine and benzodiazepines. Selective serotonin reuptake inhibitors also inhibit buprenorphine metabolism. Cytochrome CYP 3A4 interactions with azole antifungal drugs, macrolide antibiotics, and HIV protease inhibitors and may also increase concentrations of plasma buprenorphine.

The cause of death was ruled anoxic encephalopathy due to acute intoxication by combined use of Suboxoneâ, Alprazolam, and Fluoxetine. The manner of death was ruled as accidental self- administered overdose by drugs. The case is still under investigation; police are now considering criminal charges on the friend for unauthorized distribution of Suboxoneâ.

Suboxone Fatality, Death Investigation, Alternate non-biological Specimens

 ** Presenting Author*