Southwestern Association of Toxicologists
Spring 2023 Annual Meeting
Shreveport, LA

MEETING AGENDA

Wednesday, April 12, 2023

1:00 PM - 5:00 PMSAT - DRE Workshop

Marshall Depew - Indiana State DRE Coordinator

Michael Wittl - Indiana State Assistant DRE Coordinator

Chris Kirby - Indiana State Law Enforcement Liaison (NE Region)

Abstract:

This afternoon workshop incorporates a live demonstration and discussions on how to administer the DECP Evaluation from Certified Drug Recognition Experts. The topics are designed to enhance the understanding of the Drug Evaluation and Classification Program (DECP) for toxicology professionals and the usefulness of DRE evaluations in interpreting behavior in impaired driving situations. A presentation of exemplar case studies will illustrate how toxicologists can collaborate effectively with law enforcement and legal professionals to resolve a case.

Agenda:

1. Overview and History of the DECP
2. Validation Studies
3. Case Studies & Success for Indiana Toxicology
4. Demonstration of Evaluation Process

6:00 PM - President's Reception Allure Lounge

Thursday, April 13 2023

7:30 AM - 8:30 AM Breakfast - Provided by Venue

8:30 AM - 8:45 AM Opening Remarks Justin Schwane - SAT President

8:45 AM - 9:00 AM Welcome Tim Manger - Shreveport Chamber of Commerce

Scientific Session #1

9:00 AM - 9:30 AM *Maria Olds- Garriott Award* Winner

Statistical comparisons of 0.08 g/100 mL fortified blood from 6-mL and 10-mL gray-top tubes

Abstract

There is a large body of research supporting the validity of forensic blood alcohol determinations in blood specimens, however, as with any scientific discipline, research gaps remain. One such gap that needed addressed was research supporting the usage of 6 mL gray-top tubes used for blood alcohol determination, which contain 15 mg sodium fluoride (NaF) and 12 mg potassium oxalate, versus 10-mL gray-top tubes, which contain 100 mg NaF and 20 mg potassium oxalate.

In 2019, following a tube recall from BD (10-mL tubes) and challenges by defense experts in court and in an article written in a regional newspaper (6-mL tubes), the Fort Worth Police Department sponsored a multivariate study to determine whether the two types of tubes would provide data that could be statistically differentiated. Variables included tube type, fill volume, concentration, and temperature of storage. The initial research was published in the Journal of Forensic Sciences (JOFS) under the title "Statistical comparisons of blood alcohol samples from 6-mL and 10-mL grey-top tubes," in March 2021. A follow-up study, concerning 0.08 g/100 mL samples, was published in November 2022 under the title "Statistical comparisons of 0.08 g/100 mL fortified blood from 6-mL and 10-mL gray-top tubes," also in JOFS. Lastly, unpublished data regarding reanalysis of 6-mL tubes will also be presented, which is planned to be submitted for publishing in the near future.

9:30 AM - 10:00 AM Joseph Jones

RealTime Toxicology Data Using PowerBI

Abstract

This lecture aims to explore the use of Microsoft Power BI in displaying real-time data for the North Louisiana Crime Lab. The lecture will cover the advantages of using Power BI over traditional methods of data visualization and reporting, such as spreadsheets and static reports.
The presentation will highlight the benefits of using Power BI's interactive dashboards and visualizations to gain real-time insights into the Crime Lab's data. Additionally, attendees will learn how Power BI can streamline data processing and reduce manual reporting efforts, ultimately increasing efficiency and productivity within the Crime Lab.

The lecture will also provide a demonstration of how to integrate various data sources into Power BI, including forensic test results, evidence tracking, and case management systems. Attendees will gain a better understanding of how to create custom dashboards and reports that meet their specific data visualization needs.

Overall, this lecture will showcase how Microsoft Power BI can enhance data analysis and reporting capabilities for the North Louisiana Crime Lab, ultimately leading to improved decision-making and faster case resolutions.

10:00 - 10:30 Break - Provided by S.A.T.

Scientific Session #2

10:30 AM - 11:00 AM

Methamphetamines and other drugs detected in Shreveport Wastewater

Kevin S. Murnane, PhD, Associate Professor of Pharmacology, Toxicology & Neuroscience; Associate Professor of Psychiatry; Director of Basic Science Research for Louisiana Addiction Research Center

Abstract

The detection of drugs in wastewater has become an emerging field of research due to its potential to provide valuable information on drug consumption patterns in a given population. This lecture aims to present the results of a recent study conducted to investigate the prevalence and levels of methamphetamines and other drugs in Shreveport wastewater.

The study collected wastewater samples over a period of six months from different wastewater collection sites throughout the Shreveport area. The samples were analyzed using liquid chromatography-mass spectrometry (LC-MS) to identify and quantify the presence of methamphetamines and other drugs.

The lecture will present the results of the analysis, including the prevalence and levels of various drugs detected in the wastewater samples. The findings will be compared to similar studies conducted in other regions of the United States to provide a broader understanding of drug consumption patterns in the country.

Additionally, the lecture will discuss the potential applications of wastewater-based epidemiology for public health surveillance and drug policy development. Attendees will gain a better understanding of the importance of monitoring drug consumption patterns in the community and how wastewater analysis can be used as a complementary tool to traditional drug monitoring methods.

Overall, this lecture will provide valuable insights into the prevalence and levels of methamphetamines and other drugs in Shreveport wastewater, as well as the potential applications of wastewater-based epidemiology for drug monitoring and policy development.

11:00 AM - 11:30 AM *Chris Heartsill*
Alcohol Calculation ASB 122 Document

11:30 - 12:00 PM *Justin Schwane - SAT President*
2019-2020 DWI Data - Before & After the Shutdown

12:00 - 1:00 PM **Lunch** - Sponsored by Phenomenex

<u>Scientific Session #3</u>

1:00 PM - 1:30 PM *Rebecca Chiasson*

Poly-drug use among Louisiana Drivers

Review of several case studies of Louisiana driver's blood samples submitted to the LSPCL for Driving Under the Influence of alcohol and/or drugs and the reported results indicating high numbers of drivers using multiple drugs before operating a motor vehicle.

1:30 PM - 2:00 PM *Peter. L. Platteborze PhD, DABCC, FAACC, Associate Prof., St. Mary's University*
Tumor Lysis Syndrome

2:30 PM - 3:00 PM Platinum Sponsor Vendor Presentation - Shimadzu

3:00 PM - 3:30 PM Break - Provided by S.A.T.

Scientific Session #4

3:30 PM - 4:00 PM *Kendra Brogden*

Fentanyl Brain Concentrations

Abstract: Fentanyl is a synthetic opioid developed in 1959 as an analgesic and anesthetic. Fentanyl has similar effects to other opioids such as relaxation, euphoria, pain relief, sedation, confusion, drowsiness, dizziness, nausea, vomiting, urinary retention, pupillary constriction, and respiratory depression. However, due to it being 100 times more potent than morphine and 50 times more potent than heroin, as well as being cheap to produce, it has become very popular to use and manufacture illicitly replacing prescription pain medication and heroin. This has led to an increase in fentanyl related deaths over the last four years in Oklahoma.

In 2022, the Oklahoma Office of the Chief Medical Examiner (OCME) worked a case where the scene and autopsy findings led the pathologist to believe that the cause of death would most likely be drug related. The pathologist was surprised to get the toxicology report back with a fentanyl concentration of <2.5 ng/mL. Review of the scene photos with drug paraphernalia suggested the decedent may have snorted fentanyl. Thus, after consultation with the Chief Toxicologist, the decision was made to test fentanyl concentration in the brain. Fentanyl brain concentration was 89 ng/g, supporting the cause of death as a fentanyl toxicity. Further discussions between OCME Pathologists and Toxicologists led to the theory that a person who overdoses on fentanyl immediately after snorting or smoking could have an incomplete distribution of fentanyl throughout the body causing blood concentrations to be much lower than expected. Moving forward, both blood and brain were tested in cases where the decedent was believed to be snorting or smoking fentanyl or in cases that presented like a drug overdose but had low fentanyl concentrations in blood. In the last nine months, the OCME Toxicology Laboratory tested 36 cases for fentanyl in both blood and brain. The mean (median) fentanyl blood concentration for these cases was 5.2 ng/mL (3.2 ng/mL) and the mean (median) fentanyl brain concentration was 40 ng/g (38 ng/g). The relatively low fentanyl blood concentrations coupled with high fentanyl brain concentrations noted in OCME cases substantiates the testing of brain in cases in which a death scene suggests smoking or snorting fentanyl and pathological findings suggest an opioid overdose.

4:00 PM - 4:30 PM - Platinum Sponsor Vendor Presentation – Waters

4:30 PM - 5:00 PM *Connie Alexia Lewis, M.S., D-ABFT-FT, Tarrant Co. MEO*

Synthetic Benzodiazepine Detection with ELISA, LC-QTOF/MS, and LC-MS/MS Part II

Abstract
Synthetic or designer benzodiazepines (DBZDs) are a rapidly growing and evolving class of novel psychoactive substances (NPS) that are commonly mixed with opioids and stimulants, then pressed

into illicit pharmaceutical pills. As a result, many toxicology laboratories struggle to keep up with the detection and identification of each new drug. DBZDs behave similarly to common licit benzodiazepines, which depress the central nervous system (CNS) to beneficially induce calmness, drowsiness, and sleep by modulating the effects of the inhibitory neurotransmitter GABA at different GABA receptors throughout the CNS. To screen toxicology cases for benzodiazepines, the Tarrant County Medical Examiner's Office utilizes enzyme-linked immunosorbent assay (ELISA) combined with analysis by liquid chromatography-quadrupole time of flight mass spectrometry (LC-QTOF-MS).

This presentation will discuss the preparation and screening of twenty-nine relevant synthetic benzodiazepines to investigate the utility of the Immunalysis© benzodiazepine ELISA kit for qualitative screening of each of the synthetic benzodiazepines tested as well as their response on the LC-QTOF-MS and a targeted liquid chromatography with tandem mass spectrometry (LC-MS/MS) analysis.

ELISA proved to be a rapid and reproducible screening method for most DBZDs. Four DBZDs (meclonazepam, nifoxipam, bentazepam, and tofisopam) screened negative in blood at all concentrations tested using the ELISA Immunalysis© benzodiazepine kit, with no indication of cross-reactivity. Three DBZDs (nifoxipam, bentazepam, and tofisopam) screened negative with ELISA in urine at all concentrations tested. At low blood and urine concentrations, norflunitrazepam, nimetazepam, bromazepam, ketazolam, cinazepam, and etizolam demonstrated limited cross-reactivity with the Immunalysis© benzodiazepine kit. The targeted LC-QTOF-MS method was successfully employed to detect all DBZDs included in the study. A validated LC-MS/MS quantitative method was utilized for confirmation of these compounds.

5:30 PM **President's Dinner @ Shreveport Aquarium** - Sponsored by Shimadzu & Waters

Friday, April 14, 2022

7:30 AM - 8:30 AM Breakfast - Provided by S.A.T.

8:30 AM - 9:30 AM S.A.T. Business Meeting

Scientific Session #5

9:30 AM - 10:00 AM *Chris Heartsill*

Regional Toxicology Program (RTL) & Updates

10:30 AM - 11:00 AM *Rachael Kliewer*

Mitragynine - Validation and Case Studies

Abstract: Kratom is a tree originating in Southeast Asia, which has a history of usage among farmers. The leaves of the tree were chewed and used by farmers as a stimulant in order to work long days. Over the years, the popularity of the drug spread worldwide and has risen in recent years. In 2016, Kratom was put on a Drugs of Concern list by the United States Drug Enforcement Administration (DEA). The rise in kratom usage was noticed in the casework of the Office of the Chief Medical Examiner (OCME) Toxicology Laboratory in Oklahoma. The cases involving mitragynine, an alkaloid in kratom, has risen over recent years but the OCME did not have a validated method for quantitation. The importance of this project was to validate a method for the quantitation determination of mitragynine and qualitative identification of 7-hydroxymitragynine and examine real world cases coming through the OCME. The extraction utilized in this method was a phosphate buffer followed by supported liquid extraction with 3 mL columns containing diatomaceous earth. The samples were analyzed using liquid chromatography paired with tandem mass spectrometry (LC-MS/MS).

The method for quantitation of mitragynine was validated by assessing interferences, bias, precision, ion suppression/enhancement, limit of detection, carryover, calibration model, and stability. The validation parameters for 7-hydroxymitragynine were interferences, ion suppression/enhancement, limit of detection, carryover, and stability. All validation parameters fell within acceptable criteria by the OCME lab. A lack of research including studies for mitragynine and 7-hydroxymitragynine has been observed and there are even fewer postmortem case studies in the literature. The cases analyzed for this study had mitragynine concentration ranges of 130-1,400 ng/mL in heart blood, 130-1,300 ng/mL in femoral blood, and 220-7,000 ng/mL in liver. The average mitragynine concentrations were 536 ng/mL (heart blood), 482 ng/mL (femoral blood), and 1,450 ng/g (liver). Central/Peripheral (C/P) and Liver/Peripheral (L/P) ratios were calculated to identify the potential for mitragynine to undergo postmortem redistribution. The C/P and L/P ratios were an average of 1.0 and 2.7 respectively, suggesting that mitragynine does not experience significant postmortem redistribution.

11:00 AM – 12:00 PM Toxicology Roundtable Discussion