

B81 The Growing Phenomenon of the Epidemic of Synthetic Opioids and Forensic Science: Impact and Response

Vincent J. Desiderio, Jr., MS, United States Postal Inspection Service, 22433 Randolph Drive, Dulles, VA 20104; Michael F. Rieders, PhD, NMS LABS, 3701 Welsh Road, Willow Grove, PA 19090; Brandon Callahan, BA, United States Postal Inspection Service, 475 L'Enfant Plaza, SW, Washington, DC 20260; Agnes D. Winokur, MS*, DEA/Southeast Laboratory, 2205 NW 132nd Place, Miami, FL 33182; Erin M. Worrell, BSc*, Cuyahoga County Medical Examiner's Office, 11001 Cedar Avenue, Cleveland, OH 44106; John F. Casale, BS*, DEA Special Testing Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166; Karl E. Williams, MD*, Allegheny County OME, 1520 Penn Avenue, Pittsburgh, PA 15222; Sherri L. Kacinko, PhD*, 3701 Welsh Road, Willow Grove, PA 19090; and Patrick Buzzini, PhD, Sam Houston State University, Chemistry/Forensic Science Bldg, 1003 Bowers Boulevard, Box 2525, Huntsville, TX 77340*

After attending this presentation, attendees will better know and understand the unprecedented spread of synthetic opioids, the trends that most law enforcement agencies face as a direct result of widespread opioid use and illicit sales, and what is currently being accomplished to better understand and combat this unceasing epidemic.

This presentation will impact the forensic science community by raising awareness of the spread of synthetic opioids and by examining perspectives from a variety of forensic science areas, including field investigations, criminalistics, forensic pathology, toxicology, and pharmacology.

In the past year, there have been more known fentanyl-related overdose deaths in the United States than in the past 60 years. The current crisis is multi-faceted and involves a global supply of the substances being smuggled into the United States. The increase of drug fatalities over the past few years demonstrates that more potent and more sophisticated designer drugs are not only available on the streets but are also finding their way into the population following internet purchases and receipt through the mail.

This session intends to address this epidemic from multiple perspectives. In March of 2017, the American Academy of Forensic Sciences, seeing a need to gather its diverse resources to evaluate the current synthetic opioid crisis, established an *ad hoc* committee. Four task groups (Analytical Chemistry, Education and Outreach, Medicolegal Issues, and Health and Safety) were created to approach this challenge from a targeted perspective. A summary of these efforts will be provided through a discussion of lessons learned and opportunities gained. Experts of various disciplines will intervene and share their experience and expertise on this topic from various perspectives.

Discussion will include how the Prohibited Mail Narcotics program with the United States Postal Inspection Service is committed to protecting its employees, customers, and the public from the dangers of handling mail pieces containing illegal narcotics and the violence associated with drug trafficking.

The facets of a medicolegal death investigation paradigm shift in Cuyahoga County, OH, will be described. A new paradigm was adopted involving consideration of the use of internet and electronic media communication, purchase and distribution of product, and new safety concerns in the investigation of drug overdose deaths. The approach to telephone interviews on death reports, scene investigation and safety considerations, and interactions with law enforcement personnel, family members, witnesses, Emergency Medical Teams (EMTs), and medical personnel has evolved.

Recently developed methodologies for signature profiling of illicit fentanyl and fentanyl-related seizures at the Drug Enforcement Administration (DEA) Special Testing and Research Laboratory will be discussed. These methodologies include the quantitative determination of fentanyl, adulterants, and diluents, the quantitative determination of occluded processing solvents, and the identification of trace synthetic impurities from clandestine synthesis. The use of profiles of fentanyl isotopes, trace components, occluded solvents, and cutting agents to chemically link fentanyl seizures in which relationships were previously unknown or only suspected will also be discussed.

Detection, identification, and reporting of these novel and emerging illicit opioids is technically challenging, mainly due to their structure similarity and their mixture with other drugs. A Real-Time Communication Network has been created by the DEA Southeast Laboratory to provide technical assistance to forensic scientists and to facilitate the rapid dissemination of information regarding the analysis of synthetic opioids in real time. The use of this communication tool to share information of emerging synthetic opioids as they are being identified will be reviewed.

From a medicolegal perspective, the development and implementation of an online website that provides public access to a wide array of drug-related death surveillance resources and tools will be described. This database is populated by medical examiners and coroners' agencies and can be accessed by the public with no intermediary. This resource gives users access to detailed information regarding specific drugs, demographic information pertaining to the decedent, and to investigational findings related to the circumstances of the death.

An overview of the role of pharmacology and toxicology of opioids will be provided and the resources and analytical methodologies used to identify and quantify new drugs in driving under the influence cases and postmortem toxicology will be examined. The challenges of interpreting the role of these drugs in human performance and fatalities will be presented. In addition, data collected by a large reference laboratory that performs testing for municipalities and counties across the United States will be presented.

Synthetic Opioids, Fentanyl Analogs, Pharmacology