



## Pathology/Biology Section - 2016

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### H89 North Carolina Deaths Involving Acetyl Fentanyl: A Two-Year Retrospective Review

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After attending this presentation, attendees will have greater insight into the different types of postmortem casework associated with acetyl fentanyl at various concentrations.

This presentation will impact the forensic science community by providing information regarding acetyl fentanyl as it relates to cause and manner of death determinations.

Acetyl fentanyl is a less-active synthetic analogue of fentanyl which is more potent than heroin. Although it has not been approved for use in the United States, clusters of acetyl fentanyl deaths have been reported since 2013. Prior to scheduling by the Drug Enforcement Administration in July 2015, acetyl fentanyl could be ordered over the internet ostensibly as a “research chemical” but in reality is abused in a similar manner to heroin. In the North Carolina Office of the Chief Medical Examiner (NC-OCME) toxicology laboratory, acetyl fentanyl is readily detected in the routine organic bases screen and confirmed and quantitated via a validated Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) method. Specimens collected during autopsy generally include blood (both peripheral and central), liver, urine, and vitreous humor. As limited information has been reported on the distribution of acetyl fentanyl in the body, all specimens in cases positive for acetyl fentanyl were submitted for quantitative analysis.

The investigators retrospectively reviewed medicolegal death investigation records, autopsy reports, and toxicology reports at the NC-OCME in order to identify and characterize deaths where toxicology specimens were positive for acetyl fentanyl. In a two-year period, acetyl fentanyl was detected in 18 autopsy cases. Of these, 15 were male (83.3%) and 3 female (16.7%). Twelve were White non-Hispanic (66.7%), four Black (22.2%), one Asian (5.6%), and one American Indian (5.6%). The age of these ranged from 21 years old to 42 years old.

Of the eight finalized reports, acetyl fentanyl was listed as the sole cause of death in 25% of cases, while other drugs or alcohol were contributory in 62.5% of cases. Acetyl fentanyl was detected but not listed as a cause or contributory to death in one case (12.5%). Blood concentrations in these three groups averaged 0.40mg/L, 0.33mg/L, and <0.01mg/L, respectively. Liver concentrations in these three groups averaged 1.6mg/Kg, 1.8mg/Kg, and <0.04mg/Kg, respectively.

Data collected during medicolegal death investigations, including demographics, toxicology results (blood, liver, urine, and vitreous concentrations), autopsy findings, and circumstances (including county and date of death to further characterize a geographic or temporal clustering), will be presented.

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#### Acetyl Fentanyl, Postmortem, Toxicology