

#### **44. Mechanical ventilation requirements in emergency departments patients with confirmed opioid overdose**

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**Background:** In 2022, over 107,000 drug overdose deaths were reported in the United States. It was estimated that for every fatal drug overdose, 15 non-fatal drug overdoses occur and present to emergency departments (EDs). As the illicit drug supply evolves with the presence of novel psychoactive substances, medically managing patients has become increasingly complex, particularly when the novel substances mimic known toxidromes. Limited research has been performed to examine the prevalence of advanced airway management techniques among patients experiencing life-threatening opioid overdoses. This study aims to examine the prevalence of advanced ventilatory support interventions, with a particular focus on endotracheal intubation, among patients presenting to the ED with a confirmed opioid overdose. Additionally, this study examined associations with mechanical ventilation based on sociodemographics, drug exposures, and clinical presentation.

**Methods:** The Toxicology Investigators Consortium (ToxIC) Fentalog study is an ongoing multicenter cohort study that collects clinical and laboratory data from patients presenting to ten regionally distinct EDs with a suspected opioid overdose. Clinical data elements are collected from medical record reviews, including substance use history and use practices, COVID screens, agent exposures, body system presentation patterns, antidote administrations, and applied interventions. Blood samples undergo toxicological analysis using liquid chromatography-tandem quadrupole mass spectrometry. Only patients with confirmed opioid overdose were included in this study. Descriptive statistics were calculated to evaluate the frequency of patients experiencing an opioid overdose needing advanced ventilatory support based on chart review. A waiver of informed consent was obtained, and Central/site IRBs have approved this study.

**Results:** Of the 1,588 patients who met eligibility criteria and participated, only those with confirmed opioid exposures (n=41,442) were included in this study. The majority of patients were male (73%) and non-Hispanic white (42%), with a mean age of 40 years. 350 (24%) patients were noted to experience respiratory depression and failure, with 158 (6% of all opioid exposures) being supported by endotracheal intubation and 41 (12%) being supported by BiPAP/CPAP within the first eight hours of ED presentation (p<0.01). There is a significant difference in the age of patients supported by BiPAP/CPAP to that of endotracheal intubation (p=0.02). While the majority of patients within this group were COVID-19 negative (n=466, 96%) with normal chest x-ray findings (n=525, 58%, p < 0.01),

cardiovascular changes, ranging from EKG abnormalities and rhythm disturbances to cardiac arrest, were recorded for 151 (43%) patients in this group.

**Conclusion:** In this large multicenter cohort of ED patients with confirmed opioid overdose, respiratory failure occurred in nearly one-quarter, of whom over half required some form of mechanical ventilation. Clinical factors associated with mechanical ventilation were age, adverse cardiovascular events, COVID-19, and chest radiography results. Continued research needs to be performed to better understand the unique challenges associated with ventilatory management of overdose, especially in patients who have cardiovascular abnormalities.