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were associated with greater risk of death. Collectively, these findings may help inform EMS destination decisions and the creation of trauma center specific activation criteria for patients meeting select CDC triage steps.

67 Risk-Based Assessment of the Opioid Crisis in Philadelphia, Pennsylvania Utilizing Global Information Systems as a Template for Public Health Reform
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Study Objective: Philadelphia, Pennsylvania has the highest opioid overdose fatality rate in the United States. The collective progress of combating the opioid crisis in Philadelphia is halted because the tactics imposed, and viewpoints held by numerous public service stakeholders have far more differences than similarities. Working together to bridge the gaps between prevention tactics, policies, education, and treatment is imperative for successful mitigation of this ubiquitous problem. Geographic Information Systems (GIS), a mapping software, has made it possible to view comprehensive maps that layer tangible data. This study elucidates risk factors prohibiting Philadelphia from staunching the damage, identifies the impact of prevention strategies, and analyzes treatment success.

Methods: Open-source data was collected from federal, state, and county health agencies was analyzed using PolicyMap. Individual Pennsylvania (PA) counties’ rates of deaths from all opioid overdoses per 100,000 people in 2019 was assessed in relation to the national rate (15) and the PA rate (23). Areas with rates less than 20 were shown as “insufficient data.” County rates of opioid prescriptions per 100 people were compared with the national rate (46.7) and PA rate (47). The reported Index of Medical Underservice Score (IMU) data for only Philadelphia was visualized by census tract with the upper limit adjusted to 62, to reflect the US Health Resources and Services Administration definition of a Medically Underserved Area (MUA). Non-MUA and Governor are shown as “insufficient data.”

Buprenorphine providers, drug and alcohol treatment facilities, and hospitals were plotted on the IMU and poverty maps. The Philadelphia estimated percent of people living in poverty between 2015-2019 was mapped using ranges based on census tracts. These ranges were compared to the whole national number poverty average (13) and average for Pennsylvania (12).

Results: Philadelphia’s rate of deaths from opioid overdose per 100,000 people in 2019 is 50.4, two times the PA average and over three times the national average. It is the only PA county with an opioid rate over 50. The rate of opioid prescriptions per 100 people in 2019 is 49.9, similar to the national rate (46.7) and the PA rate (47). Treatment resources, 428 buprenorphine prescribers, 84 drug and alcohol treatment facilities, and 33 hospitals, were spread out unequally within Philadelphia. Central, East, and Southwest regions of Philadelphia are MUA with a moderate concentration of buprenorphine prescribers and alcohol and drug treatment facilities. Hospitals were sparse in regions with very low IMU scores and consolidated in Central Philadelphia. Poverty rates varied throughout Philadelphia with a notable absence in hospitals in the areas with highest percentages of poverty.

Conclusion: GIS provides dynamic public health measures that underscore critical data and correlate terrain with strategic outcomes. This comparative data tool was utilized to both highlight the detrimental impact of the opioid crisis in Philadelphia and evaluate the inadequate deployment of various prevention and treatment tactics. The evidence that this region is prescribing opioids at slightly above the state and national averages while simultaneously having much more fatial opioid overdoses, highlights the need for new harm reduction strategies to reverse the pernicious trends that have devastated Philadelphia.

68 High First Dose Buprenorphine to Accelerate Induction in Emergency Department Opioid Use Disorder Patients
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Study Objectives: Assess the implementation, feasibility and patient outcomes of an accelerated buprenorphine treatment pathway where a first dose of ≥16 mg sublingual (SL) or greater is administered to treatment seeking emergency department (ED) patients with opioid use disorder (OUD).

Methods: We conducted a retrospective descriptive analysis of patients who received an initial starting dose of buprenorphine of ≥16mg SL or more during a pilot study period between 7/1/2019 and 10/1/2019. At a single high-volume urban safety net emergency department, a standardized training module on high first dose buprenorphine induction was developed and disseminated in a series of on shift didactic sessions to emergency physicians and advanced practice clinicians. Clinical decision aids were laminated and made available in treatment areas and on a departmental website. On-site support was provided by a substance use navigator (SUN), an addiction specialist consultant, and a designated ED clinical champion for the process implementation. All patients received harm reduction counseling, overdose education and naloxone distribution, motivational interviewing, and strengths-based care navigation. Each chart was reviewed using a standardized, electronic, data collection instrument; which included components of 5 validated instruments: the Clinical Opioid Withdrawal Scale, Opioid Symptom Questionnaire, and the Opioid-Related Symptom Distress Scale. Patient response to ED treatment and follow up in formal addiction treatment was reviewed.

Results: During the 3-month implementation pilot, 86 encounters with 63 unique ED OUD patients were identified between 16 and 32 mg of buprenorphine as the initial dose. In this study cohort (N=63), the average age was 38.8, 39 (62%) were male, 29 (46%) identified as white, 50 (79%) were Medicaid-insured, 16 (25%) reported to be homeless, and 52 (83%) reported heroin use. Buprenorphine was initiated with a first dose of 16mg SL at 60 ED visits (70%), 24mg SL at 20 visits (23%), and 32 mg SL at 6 visits (7%). A total of 16mg SL buprenorphine was administered at 39 visits (45%), 24mg SL total at 28 visits (35%), and 32mg SL total at 19 (22%) visits. (N=86) There were no cases of precipitated withdrawal, clinically significant respiratory depression, or excessive sedation. On 80 (93%) encounters patients were discharged home, and the median length of ED stay was 116 minutes (IQR 84 to 222). 79 (92%) encounters had no unpleasant symptoms and 5 (7%) were administered a single dose of ondansetron, ibuprofen, or acetaminophen after buprenorphine administration. (N=86) After the initial ED visit, engagement in addiction treatment was 68% at 14 days, 71% at 30 days, and 79.0% at 6 months. (N=61, excluding 2 patients who do not use buprenorphine as primary form of their medication assisted treatment).

Conclusion: We observed that a pilot ED accelerated buprenorphine treatment pathway for OUD with a first dose of ≥16 mg was implemented with indications of patient interest, clinician acceptability, and no serious adverse events.

Figure 1. Buprenorphine Dosing in Patients Choosing an Accelerated Buprenorphine Treatment Pathway

69 Initiation of an Emergency Department Buprenorphine Induction and Medication-Assisted Treatment Referral Program in the COVID-19 Pandemic
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Study Objective: The prevalence of Opioid Use Disorder (OUD) has been rising in the United States. Buprenorphine induction for OUD in the emergency department
Methods: This case series includes adult ED patients who presented after a suspected opioid overdose to an emergency department at a participating site in the American College of Medical Toxicology’s Toxicology Investigators Consortium (ToxIC) fentanyl study group between 10/6/20-5/9/21. Case exclusion criteria were unavailable specimens, non-toxicological alternate diagnoses (trauma, burns, sepsis), prisoners, and children <18. Participating sites include 5 facilities in 4 States (Pennsylvania, Missouri, New York, and Oregon). Discarded blood samples were collected and toxicological confirmation was performed via liquid chromatography quadrupole time-of-flight mass spectrometry for the presence of over 900 psychoactive substances and their metabolites, including adulterants. Patients included in this analysis were positive for at least one adulterant upon toxicological confirmation.

Results: Out of 760 patients screened, 81 met inclusion criteria: the median (IQR) age was 36 (34-49) years and the majority were men (59; 72.8%). Of the 81 samples tested, 61 contained illicit opioids Only 4 (4.9%) of the 61 lacked adulterants. Adulterants present are summarized in the Table, and included quinine (41; 50.6%), levamisole (25; 30.9%), xylazine (16; 20%), lidocaine (16; 20%), phenacetin (13; 16%), and diphenhydramine (12; 14.8%). Phenacetin was primarily confined to samples from PA, whereas levamisole, lidocaine, and xylazine were located in Pennsylvania and Missouri. Quinine was present from samples in all four states. While most samples that tested positive for either phenacetin or levamisole had the presence of cocaine, 4 out of 25 (16%) samples that contained levamisole lacked any evidence of cocaine.

Discussion: In this cohort, adulterants were widespread, even though there was geographic variation. While this analysis was not designed to evaluate toxicity from the adulterants specifically, it is possible that toxicity occurs. Quinine is a 1a anti-arrhythmic, and is associated with nausea, vomiting, hypoglycemia, thrombocytopenia, and cinchonism (tinnitus, blindness, and dizziness). Phenacetin is associated with renal failure with papillary necrosis, oxidant stress, and is a probable carcinogen. Levamisole is associated with agranulocytosis and vasculitis with disfiguring skin necrosis. Xylazine is a phenoxyazine used in veterinary medicine as a sedative, and its toxicity includes severe hypertension and CNS depression. Lidocaine is a local anesthetic associated with seizures and arhythmias in high doses. Diphenhydramine has been associated with urinary retention, delirium, as well as other antimuscarinic symptoms, seizures, and arhythmias.

Conclusion: In this cohort, adulterants were detected often in the blood samples of patients with illicit opioid overdose, and variations of adulterants were based on the specific opioid as well as geographical region. The most consequential adulterants physicians should be aware of include phenacetin, quinine, levamisole, and xylazine.

Table I: Characteristics of common adulterants

| Adulterant | N | Drugs Associated | States Affected |
|------------|---|-----------------|----------------|
| Quinine    | 41 | Fentanyl, Heroin, Methadone, Oxycodone, Amphetamine, Methamphetamine, Cocaine, PCP, mCPP | MO, NY, DR, PA |
| Levamisole | 25 | Fentanyl, ButyrylFentanyl, Methadone, Oxycodone, Amphetamine, Methamphetamine, Cocaine, MDMB-4en-PINACA | MO, PA |
| Xylazine   | 16 | Fentanyl, ButyrylFentanyl, Methadone, Oxycodone, Methamphetamine, Cocaine | MO, PA |
| Lidocaine  | 16 | Fentanyl, ButyrylFentanyl, Methadone, Oxycodone, Amphetamine, Methamphetamine, Cocaine | MO, PA |
| Phenacetin | 13 | Fentanyl, Oxycodone, Methadone, Amphetamine, Methamphetamine, Cocaine, MDMB-4en-PINACA | PA |
| Diphenhydramine | 12 | Fentanyl, Heroin, Methadone, tramadol, Amphetamine, Methamphetamine, Cocaine, mCPP | MO, PA |

71 Adulteration of Illicit Drugs in Emergency Department Patients With Acute Opioid Overdose: A Multicenter Cohort

Methods: In this retrospective chart review, 21 institutions participated, enrolling patients who presented to one of 21 emergency departments in the Greater New York Area between 1/1/2018 and 12/31/2019. Patients were included if they had a suspected opioid overdose and were admitted to the hospital. Exclusion criteria included a history of opioid use disorder, an opioid overdose that occurred while the patient was in the hospital, or a documented suicide attempt. There were 108 patients identified, and 90 of these patients met inclusion criteria. The median (IQR) age of the patients was 37 (28-47) years, and the majority were men (63; 70%). The median (IQR) number of visits per patient was 2 (1-3). The most common presenting symptoms were agitation (65; 72%), pain (63; 70%), and respiratory depression (59; 66%). The most common co-administered substances were benzodiazepines (54; 60%), amphetamines (29; 32%), and marijuana (15; 17%). The most common co-administered medications were oxycodone (47; 52%), clonazepam (44; 50%), and lidocaine (38; 43%). The most common co-administered devices were naloxone (67; 75%), oxygen (64; 72%), and a defibrillator (62; 70%). The most common management interventions were naloxone administration (67; 75%), oxygen administration (64; 72%), and ventilation (61; 68%). The most common hospital interventions were admission (90; 100%), medication administration (86; 96%), and discharge (81; 93%). The most common discharge destinations were home (62; 70%), a nursing home (14; 16%), and a hospital (14; 16%). The most common discharge diagnoses were opioid overdose (90; 100%), respiratory depression (51; 57%), and agitation (47; 52%). The most common post-discharge events were hospital readmission (25; 30%) and death (22; 25%).