In-Hospital Substance Use and Possession

A Study of Events From 38 Acute Care Hospitals in Pennsylvania

By Matthew A. Taylor, PhD,* Alexandra Nowalk, MPH† & Alex Falk, BS‡
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Patients’ substance use and possession at acute care hospitals is an understudied topic. To learn more about this topic, we queried the Pennsylvania Patient Safety Reporting System (PA-PSRS) for events that occurred during calendar year 2018. We identified 106 reports from 38 acute care hospitals (excluding psychiatric, detox, and behavioral health units and facilities) where a patient possessed and/or misused a substance (e.g., heroin, oxycodone, liquor). We analyzed these reports to better understand how hospital personnel attempt to prevent in-hospital substance use and manage patients who are at risk for using a substance. We explored a range of variables, including antecedent conditions and hospital personnel’s actions post-detection of a patient’s substance use or possession. We found that a relatively low percentage of patients (26%) were identified as having a prior history of substance use, despite later using or being in possession of a substance in hospital. In our sample, patients frequently acquired the substances from visitors, more than half of the substances were consumed intravenously, and opioids were the most common substance. The most prevalent actions taken by hospital personnel were conducting searches for substances and paraphernalia, use of a patient sitter or video monitor, moving patients to a different room, and implementing visitor restrictions. Based on our findings and previous research, hospitals should consider increasing their use of substance use disorder (SUD) screening tools, pharmacotherapy, and referring patients to treatment. Overall, our results can help personnel better understand the nature of and strategies that may reduce the likelihood of in-hospital substance use.

Keywords: substance use, paraphernalia, substance use disorder, in-hospital, addiction, opioid, risk mitigation, patient safety

*Corresponding author
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†School of Pharmacy, University of Pittsburgh
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Substance Use Disorder (SUD) is a condition ranging from mild to severe involving continual alcohol or other drug use despite social or physical harm resulting in significant changes in social and psychological functioning. According to a recent study, 20.2 million adults in the United States meet the criteria for a substance use disorder (SUD). Unfortunately, that study also estimated that fewer than 8% of those adults received SUD treatment at a specialty facility. With a relatively low percentage of adults receiving treatment, it is likely that SUDs will continue to have a notable impact on many areas of society, including the healthcare industry.

Several studies have reported that persons who engage in substance use or who have an SUD are more likely to visit the emergency department or an urgent care clinic than persons without substance use disorder entirely.2-4,10-12 Recently, a further study found that the rate of emergency department visits among persons with an SUD increased yearly from 2006 to 2013, increasing by a cumulative 37%.5 A recent study found that the rate of emergency department visits among persons with an SUD in increased yearly from 2006 to 2013, increasing by a cumulative 37%.5 This increase in the rate of SUD has been linked to the epidemic and drug-related overdoses that have exacerbated this increase in emergency department visits. From 2016 to 2017, cases of nonfatal drug overdoses presenting to the emergency department increased yearly from 2006 to 2013, increasing by a cumulative 37%.5

Methods
Sample
The first author conducted a query of the Pennsylvania Patient Safety Reporting System (PA-PSIRS) to find a patient intravenous drug use or possession. The query was restricted to events that occurred at hospitals between the dates of January 1 and December 31. The query included 103 unique keyword filters, each of which consisted of a single phrase (x = 14; e.g., “heroin”, “stamp bag”, “smart”, “glass pipe”) or a combination of two phrases (x = 8; e.g., “security AND substance”, “po-lice” AND “room search”, “visitors” AND “drug”). Using the aforementioned criteria, the query produced a total of 522 events.

Examples of In-Hospital Substance Use

Example #1: The patient was admitted for an overdose earlier in the day. A nurse reported that the patient was in the bathroom for an extended period of time and would not open the bathroom door. The staff forced the door open and found the patient unresponsive. Naloxone was administered and the patient became responsive. The patient communicated that she had snorted fentanyl in the bathroom. She acquired the drug from her clothing, which were in the room and had not been searched prior to the event.

Example #2: Staff were cleaning the patient’s bathroom. Under a towel, staff found a used syringe and spoon with white residue. Security confiscated the paraphernalia.

Example #3: Patient was diaphoretic and engaging in rocking behavior. The patient admitted to consuming a bag of heroin with a visitor. Staff searched the room and found several empty bags and multiple needles. The patient was transferred to a higher level of care for closer monitoring, and the visitor left the hospital.

Data analysis
Note: Information in each event example was modified to ensure confidentiality.

Antecedent conditions are defined as any information considered or actions taken by hospital personnel prior to detecting the patient’s in-hospital substance use or possession.

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When a person with an SUD seeks medical care, the providers are often unaware of the disorder or may not anticipate how the disorder could impact the person’s behavior while under care.6 For example, a provider might be surprised to discover that a patient intravenous drug use or possession while in hospital and even more surprised to find the patient unresponsive due to an overdose. Despite the reality of this problem, we identified only three studies of patients’ substance use while at an acute care hospital.7-9 In two of those studies, the measurable percentage of patients with an SUD engaged in substance use while in hospital.10,11 Despite the value of these studies, only one of the studies was conducted in the United States, and that study had a sample of 42 patients.12

The purpose of this descriptive study was to evaluate event reports from acute care hospitals to better understand how they attempt to prevent in-hospital substance use and manage at-risk patients. In our study, we explored a range of variables, including antecedent conditions and hospital personnel’s actions post-de- tection of a patient’s substance use or possession. The findings will help hospitals consider various strategies for helping at-risk patients and reducing the likelihood of in-hospital substance use and possession. Additionally, with our results and other supporting information, we anticipate that hospitals could develop educational material to promote awareness among staff.

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The next step was to apply a filter, reducing the data set from 522 to 366 events by excluding events that occurred in a psychiatric and chemical dependency units. These events were removed from the data set because psychiatric and chemical dependency units often operate under more restrictive policies and security protocols than other service lines and units throughout hospitals. All events included in this study occurred at acute care hospitals and did not include events from behavioral health hospitals.

Based on the remaining 366 events, the first author manually reviewed the free-text narrative fields for each event and removed any events that did not involve substance use or possession. It is our intention that information gathered from these variables will help healthcare personnel better understand the various conditions and challenges associated with in-hospital substance use and possession.

When manually reviewing the event reports, 25 of the 33 variables were being coded for presence or absence of the target factor. For example, all 106 events were coded for whether or not the reported mention involved paraphernalia. Additionally, 8 of the 33

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variables required that all variations of the condition or action were recorded, which allowed us to create an inclusive list of all relevant information. For example, in each report, notes were taken on each type of paraphernalia mentioned (e.g., syringe, spoon, straw, pipe, substance wrapper), which helps us better understand the specific nature of in-hospital substance use and possession.

In this descriptive study, all variables were measured, analyzed, and compared by frequency of occurrence.

Results

Patient Age and Gender

Across the 106 event reports, 55% (n=58) of the patients were identified as male and 45% (n=48) were female. Among the 106 patients, the median male age was 38 years (range: 23–70) and median female age was 33 years (range: 19–58). As indicated in Figure 1, the distribution of in-hospital substance use and possession differs by age group and gender. Although the sample is limited, the findings suggest that males of a greater age (e.g., 61–70 years) are associated with in-hospital substance use in comparison to females.

Event Classification (Serious vs. Incident) and Care Area

Based on the reports, no patient death or permanent harm was associated with substance use or possession. Overall, 8% (8 of 106) of the events were classified as Serious and 92% (98 of 106) were categorized as an Incident. These findings indicate that, at worst, patients experienced temporary harm that may have required prolonged hospitalization. As shown in Table 1, the events occurred across 11 care area groups.

Hospitals and Geographic Regions

According to the 106 reports, patient in-hospital substance use and possession was reported at 38 hospitals, with a median of 2 events per hospital (range: 1–12). The events occurred at facilities in each category of bed size (1–100, 101–200, 201–300, and >300), but were most prevalent at hospitals with >300 beds (58%; 61 of 106) and least common at hospitals with 1–100 beds (3%; 3 of 106). The events occurred in 21 of the 67 counties in Pennsylvania, with a median of 3 events per county. The greatest percentage of events were reported in the following counties: Allegheny (32%; 34 of 106), York (12%; 13 of 106), and Philadelphia (8%; 9 of 106).

Detection of In-Hospital Substance Use and/or Possession

This category of variables focused on the conditions that provided suspicion or clear indication that a patient possessed and/or was using a substance. Based on review of the 106 event reports, only 5% identified the role or relationship of the person who detected the substance use and/or possession. Among those reports, 66% (35 of 53) of the persons who detected the event were identified as nurses; 9% (5 of 53) were support staff (e.g., nurse assistant, sitter, or video monitor); 8% (4 of 53) were non-clinical staff (e.g., housekeeper, registration staff; security); 8% (4 of 53) were technologists or therapists; and the remaining 9% (5 of 53) were physicians, visitors, or other patients.

Across all 106 events, substance use and/or possession was detected based on the observation of one or more of the following variables (not mutually exclusive): change in patient’s behavior or condition (60%; n=64), visible substance (33%; n=35), visible paraphernalia (31%; n=33), patient admitted to using a substance (5%; n=5), and/or patient was observed using a substance (5%; n=5). Changes in the patient’s behavior or condition included abnormal clinical assessment findings (e.g., lethargy, disorientation, hyperactivity, diaphoresis, slurred speech) and unresponsiveness. Figure 2 depicts the distribution of behavioral and clinical conditions used to detect substance use and/or possession across all 106 events.

Nature of In-Hospital Substance Use and/or Possession

This category of variables focused on conditions associated with the patients’ in-hospital substance use and acquisition of the substance. Based on a manual review of the 106 event reports, 3% (n=3) of patients acquired the substance from the hospital. In these three events,
the patients were prescribed an oral medication, but did not consume it as intended and instead self-administered it intravenously. Also, 26% (28 of 106) of the reports indicated that the patient received or likely received a substance from a visitor. Upon further review of those events, we found that 15 of the 28 visitors had an identified relation with the patient. Among those with an identified relation, 40% (6 of 15) were a “spouse” or “partner,” 33% (5 of 15) were “family” (e.g., a sibling), and 27% (4 of 15) were a “friend.”

While reviewing the event reports, we also learned that at least 82% (87 of 106) of the patients had likely consumed a substance while in hospital. Though it was often unclear what substance(s) was consumed, 66% (57 of 87) of the event reports indicated the method of consuming the substance. Among those reports, a substance was consumed intravenously by 63% (57 of 57) of the patients, intranasally by 18% (10 of 57), orally by 14% (8 of 57), intramuscularly by 18% (10 of 57), subcutaneously by 18% (10 of 57), intraperitoneally by 14% (8 of 57), and as non-nicotine based smoking/vaping by 5% (3 of 57). Finally, the event reports revealed that an opioid reversal agent (e.g., naloxone) was administered to 26% (23 of 87) of the patients who engaged in in-hospital substance use.

Figure 2. Distribution of Events Where Patients’ In-Hospital Substance Use and/or Possession Was Detected by Change in Behavioral and Clinical Conditions

Table 2: Hospitals’ Patient-Specific Actions Prior to In-Hospital Substance Use and/or Possession

| Event | Percentage (Frequency) |
|-------|------------------------|
| 1. Pre-event, search was performed, visitor restrictions were implemented, and/or a sitter/video monitor was assigned. | 11% (12 of 106) |
| 2. Pre-event, patient received a social services/psychiatric consult and/or was administered a screening tool for substance use disorder. | 4% (4 of 106) |
| 3. Pre-event, patient was prescribed or administered medication to aid with substance craving or withdrawal (pharmacotherapy). | 2% (2 of 106) |
| 4. Pre-event, patient was denied or restricted specific medications. | 2% (2 of 106) |

Table 3: Substances Involved In or Confiscated During Event

| Category | Percentage (Frequency) |
|----------|------------------------|
| Unidentified | 41% (40 of 116) |
| Pharmaceutical | 33% (38 of 116) |
| Opioid/narcotic antagonist | 12% (14 of 116) |
| Anticonvulsant | 11% (13 of 116) |
| Street Drug | 2% (2 of 116) |
| Marijuana | 5% (5 of 116) |
| Caffeine | 3% (4 of 116) |
| Methamphetamine | 1% (1 of 116) |

Note: Across all 106 event reports, there were 116 substances involved or confiscated. 10 of the reports described a patient with two or more substances.
findings could be representative of many acute care hospitals, both within and outside of Pennsylvania.  

**Educational Material for Hospital Personnel**  
Our findings, combined with information from other published research, could be transformed into educational material to help hospital personnel better understand the challenges and conditions associated with in-hospital substance use and possession. For example, the material could highlight that a high percentage of substance use were brought into the facility by visitors, including family. Additionally, it could inform staff that more than half of the substances were consumed intravenously, and opioids were the most common category of pharmaceutical and street drug. Many of the illicit items were found in personal property (e.g., bag/purse), on person (e.g., pocket, sock), and frequently in multiple locations. Overall, this type of information could be useful for many categories and levels of staff, including those who are new to healthcare and staff who are frequently around patients, but do not have clinical responsibilities (e.g., housekeeper, security). Depending on the learning objectives, the educational material could range from a one-page document that highlights key points to a computer-based training with images, videos, and a learning assessment. Regardless of the medium and depth of educational material, the goal should be to help personnel more accurately identify and understand conditions with implications for patient safety. Most importantly, language used in both provider and patient-facing materials should be nonjudgmental to minimize perpetuating stigma associated with substance use and to increase patient engagement.  

**Approaches to Identifying Patients at Risk for In-Hospital Substance Use**  
As noted previously, a relatively low percentage of event reports (26%) identified patients as having a history of substance use, despite being found using or in possession of a substance. This indicates that hospitals should explore additional approaches to increase their accuracy of identifying patients with an SUD. Traditionally, clinicians have used chart reviews, interviews, blood alcohol concentration level tests, urine drug screens, and physical exam findings to guide identification of patients who may have an SUD. More recently, hospitals have been increasing their use of validated screening assessments and tools to identify patients with an SUD. For example, a provider may use the Clinical Opiate Withdrawal Scale (COWS) to assess a patient’s behavior and withdrawal symptoms to determine the degree of opioid dependence. With many of the screening tools, patients are administered a brief “prescreen” consisting of one to three questions. Common validated initial screening instruments include the National Institute on Alcohol Abuse and Alcoholism (NIAAA) single-question screen for alcohol; the National Institute on Drug Abuse (NIDA) single-question screen for drug use; the Alcohol Use Disorders Identification Test – Consumption (AUDIT-C); and the Alcohol, Smoking and Substance Involvement Screening Test Frequency and Concern (ASSIST-FC). If patients screen positive during the prescreen, then a full screening tool should be administered to further assess for at-risk substance misuse, including SUD.  

From a workflow perspective, substance use screening within acute care facilities is typically administered during the patient intake or triage process. SUD screening tools often take fewer than five minutes to administer but may take longer if patients are engaging in polysubstance use, which may require the administration of multiple screening tools. Time constraints and lack of training are commonly cited as barriers to the full integration of substance use screening within clinical workflows, especially in emergency departments. However, using a brief prescreen and administering full screening to only patients that score positive on the initial screen (i.e., AUDIT-C) saves significant time and eliminates the need for staff to conduct cotherapy, such as motivational interviewing, to facilitate patient care.  

In our study, we found that only 2% of the event reports indicated that patients were administered medical intervention either pre- or post-event, to help with their in-hospital withdrawal symptoms and substance cravings (i.e., pharmacotherapy). Recent literature, which was primarily focused on medium- and long-term reduction of opioid substance use, highlights some benefits of administering buprenorphine in hospital. While we are not aware of any research specifically focused on administering in-hospital pharmacotherapy to prevent in-hospital substance use, it seems likely it could be an effective approach and may also deter patients from leaving AMA by mitigating their withdrawal symptoms. As noted by others, further research is needed on the use of in-hospital pharmacotherapy, such as buprenorphine, as there might be unintended and negative consequences.  

Finally, our findings indicate that few patients (4%) were being referred to substance detox or treatment. From a public health perspective these events can possibly be reduced, or even prevented, by detecting at-risk behaviors early, intervening to reduce risk, and linking patients to specialty treatment, as appropriate. Screening, Brief Intervention, and Referral to Treatment (SBIRT) is one such evidence-based practice which involves universal screening and early intervention with individuals at-risk for developing an SUD. Traditionally, public health approaches to substance use have largely focused on primary prevention (e.g., delaying or inhibiting the onset of substance use) or tertiary treatment (e.g., providing specialized treatment to individuals that have already developed an SUD). Thus, patients who are engaging in risky substance-use behaviors as motivational interviewing, to facilitate patient care.
but have yet to develop an SUD are not typically identified via existing clinical pathways. SBIRT fills these gaps and provides a comprehen- sive continuum of care by linking patients to an appropriate inter-vention intended to meet the patient’s level of risk.

The evidence base for SBIRT within acute care facilities is robust, lead- ing to improved patient outcomes and reduced healthcare costs. For example, Burnette et al. found in a 2018 study that integrating SBIRT within an urban-based emergency department led to a 21% reduction in healthcare costs and a significant reduction in one-year emergency department-readmissions amongst patients that received SBIRT ser- vices. Further, referring patients to SBIRT (via facilitated referrals between health care specialists/coaches) can directly facilitate the referral process. 46

The cost for these positions is typically covered through savings in downstream healthcare costs. In Pennsylvania, the Department of Health (DOH) and Department of Drug and Alcohol Programs provide guidance to acute care facili- ties seeking to establish a facilitat- ed referral process between their facility and local SUD treatment providers. 48 Overall, referring patients with an SUD—particularly those engaged in hospital sub- stance use—to specialty treatment will help to address many challenges as- sociated with substance use, including those regularly observed in acute care hospitals. 49, 50

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Conclusion

Our findings indicate that patient in-hospital substance use and possession is a challenge across Pennsylvania in both rural and urban emergency departments. Based on the event reports summarized in our review, it is evident that hospitals’ approaches to proactively prevent and reactively address substance use and possession vary. This could be due to the wide-ranging contexts of the events, variability of hospital staff, and historical lack of systematic data collection. However, our findings provide a foundation to build upon and improve SBIRT implementation in acute care settings.

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Screening, Brief Intervention, and Referral to Treatment (SBIRT): Toward a comprehensive and integrated approach to the delivery of early intervention and treatment services through universal screening for persons with substance use disorders and those at risk.

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