DRUG DIVERSION DIGEST: YEAR IN REVIEW

$301.1M lost to organizations and payors represents only the tip of the drug diversion iceberg

Protenus, Inc.

Introduction

The 2017 Annual Drug Diversion Digest is the first report of its kind to analyze publicly-available drug diversion incidents involving healthcare workers. Protenus, a compliance analytics platform that uses artificial intelligence to audit user behavior in electronic health records and pharmacy systems for the nation's leading health systems (and publishes the widely-acclaimed Breach Barometer), analyzed 365 diversion incidents reported in online news stories. These incidents took place at various stages that include incident discovery, and accusations, arrests, charging, and sentencing of diverters. This retrospective shares key insights extracted from the aggregated dataset.

Our hope is that by equipping healthcare leaders with a new level of insight into this issue, they will be able to better protect members of their workforce who might be vulnerable to drug abuse, and keep patients safe from potential harms associated with diversion. Additionally, this report provides actionable recommendations that healthcare organizations can take to improve patient and provider safety.

Moving forward in 2018, Protenus will publish a regular Drug Diversion Digest that expands the scope of this inaugural report in terms of breadth of analysis as well as trends that become discernible over time.

Limitations of 2017 diversion data

Drug diversion is "the transfer of a controlled substance from a lawful to an unlawful channel of distribution or use." This could mean a nurse pocketing pills or replacing powerful narcotics with lower strength medications. Pharmacists might write fraudulent prescriptions. In especially abominable cases, providers tamper with vials or syringes of powerful narcotics, potentially exposing themselves and patients to infectious diseases. In 2017, there were instances of all these scenarios and more.

While the dataset we have collected is groundbreaking in many ways, it only represents a limited set of diversion events carried out by healthcare employees - what we often call the tip of the iceberg.

Historically, publicly available data on diversion incidents has been notably sparse and inconsistently aggregated. This includes news articles, which until now, remained largely siloed across hundreds of local news websites. To locate the articles included in this analysis, we tracked a number of keywords related to diversion using public search engines. Based on the results that these searches yielded, we further narrowed our scope to include articles published in 2017 and involving healthcare workers in the US being discovered, reported, arrested, charged, or sentenced for diversion incidents. Note that we excluded incidents where charging happened in earlier years.

Although pill mill or prescription fraud cases might not fall within traditional definitions of drug diversion, we have included them in our analysis because they offer another means that healthcare workers inappropriately interact with controlled substances. Additionally, while most incidents in our analysis for which we have data involved at least one controlled substance, we have also included incidents that involved prescription drugs more broadly because they can pose similar dangers as controlled substances.

There are more comprehensive sources of drug diversion incidents than this one including DEA, state licensing board, departments of health, and law enforcement databases, but these repositories remain inaccessible to the public or provided on a significant delay. However, both types of sources - media outlets and databases - still depict incomplete portrayals of the scope of the problem for two main reasons (outside of a legitimate need for confidentiality in many cases).

First, many incidents that healthcare organizations detect go unreported. According to Scott Byington, Former President of the Utah chapter of the National Association of Drug Diversion Investigators (NADDI) and a pharmaceutical investigator with the Layton Police Department, "Many of these cases are often handled internally by the hospital and licensing boards but aren't reported to law enforcement...A lot of the clinics or hospitals, when

they catch employees doing theft, I would say more go unreported than reported." Therefore, even databases like the DEA's insufficiently capture the full scale of the problem.

John Burke, President of the International Health Facility Diversion Association (IHFDA), further explains how the minimal amount of reporting that occurs not only diminishes our ability to understand the problem area, but also how it negatively impacts patients and diverters: "The lack of diversion reporting by healthcare facilities in America is nothing new. This has gone on for decades, and can negatively impact innocent patients while providing no effective rehabilitation for the offender, putting them sadly closer to personal devastation or even death due to their addiction."

Second, most healthcare organizations detect only a fraction of all diversion incidents in which their employees engage. While technologies that enable healthcare organizations to understand healthcare workers' prescribing behaviors are becoming more widely available and utilized, most drug diversion monitoring programs continue to lack the ability to comprehensively monitor every single controlled substance transaction that occurs within a system. Until this occurs, the true full scope of the issue will remain unknown.

In the meantime, it's essential that individuals and organizations with a vested interest in keeping patients and providers safe from the harms of diversion collaborate to continuously find ways to better understand the severity and scale of the issue.

No healthcare institution type is safe from diversion

Ambulance Services - 2.61%

Other - 2.94%

Long-term Care - 26.80%

Hospitals/Medical Centers - 37.25%
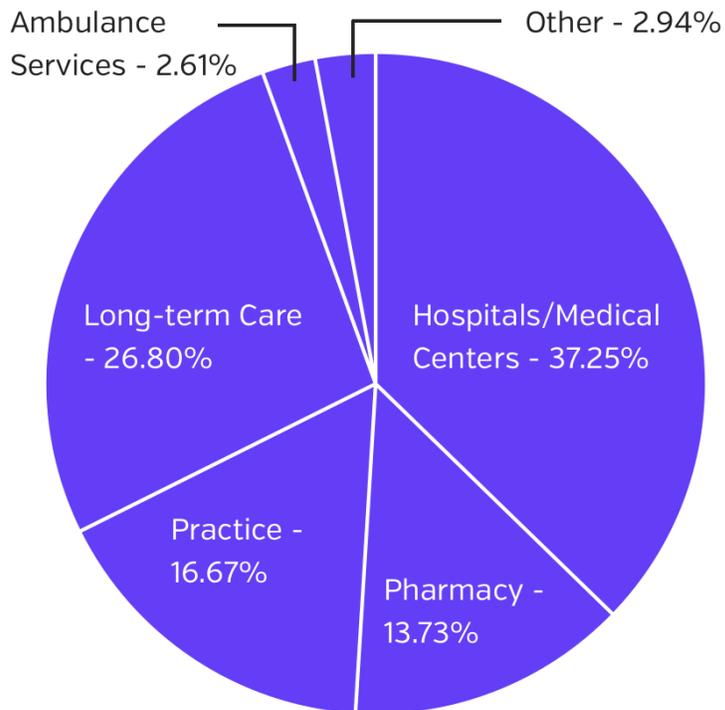
Practice - 16.67%

Pharmacy - 13.73%

Figure 1. Types of institutions where incidents occurred, 2017 public diversion incidents

Of the 365 incidents we identified, we have data on institution type available for 306 of them. 37.25% of the 306 incidents occurred at hospitals or medical centers. This category is inclusive of both inpatient and outpatient settings.

It's important to note that this doesn't necessarily mean that nearly 40% of drug diversion incidents occurred in this environment. More likely, because hospitals and medical centers have more resources than other institution types, they are better equipped to more effectively detect this sort of activity. Additionally, due to their larger size and notable reputations, they are more likely to receive news coverage than other types of healthcare organizations.

26.80% of incidents for which we have data occurred in long-term care settings, which includes assisted living, nursing home, rehab facilities, respite care, and hospice facilities.

The challenges of drug diversion inherent to the long-term care environment are two-fold.

- There is a high volume of narcotics moving through these facilities since many patients are prescribed them to manage chronic diseases and pain. Studies report that up to 83% of elderly adults experience some level of pain in their daily lives. Yet long-term care facilities have been largely exempt from the national crackdown on opioid prescriptions due to this exact reason. However, now experts are calling for these institutions to do more to identify individuals who might be stealing narcotics.
- Many patients receive long-term care in the place that they call home as opposed to a hospital or doctor's office setting. Therefore, it's more challenging to impose supervision and surveillance mechanisms on long-term care workers.

Within this long-term care category, hospice, a quickly growing industry that serves over 1.6 million people per year, presents a unique situation because these facilities exclusively serve dying patients who often rely on narcotics to reduce suffering. According to Joe Rotella, Chief Medical Officer of the American Academy of Hospice and Palliative Care, "problems related to abuse of, diversion of, or addiction to prescription medications are very common in the hospice population." As the hospice industry continues to grow, it will be interesting to track how these numbers evolve over time.

Medical practices were the third most common site, accounting for 16.67% of incidents and a large portion of prescription fraud cases. Pharmacies followed with 13.73% of incidents, and ambulance services at 2.61%. Other types of institutions, such as school nurse and doctors' offices and jail medical offices, comprised 2.94% of incidents.

Nurses highly vulnerable and involved in 41% of publicly-disclosed diversion incidents
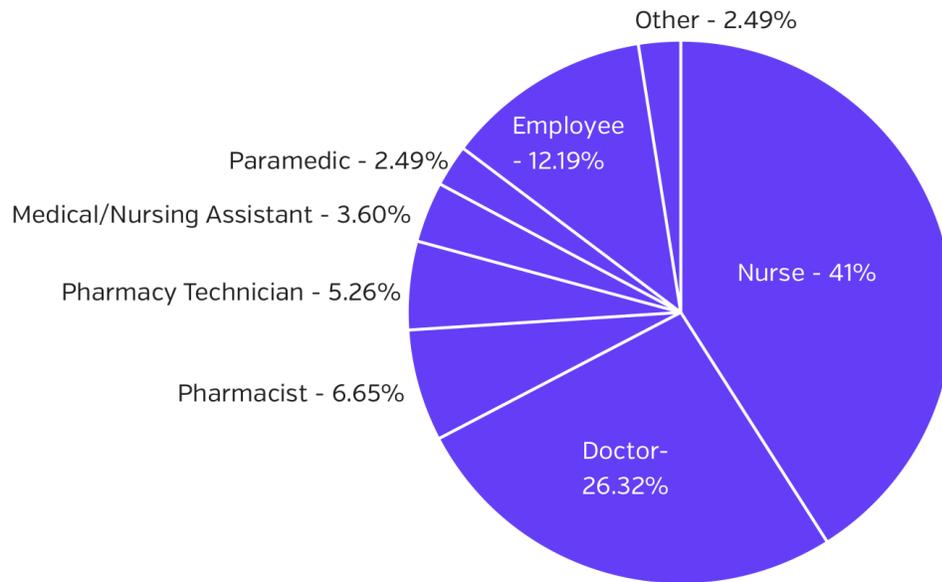

Figure 2: Healthcare worker roles involved in diversion incident, 2017 public diversion incidents

Within our dataset, we have data available on the diverter's role in healthcare for 361 incidents. Nurses were the most common diverters, accounting for 41% of incidents. The high stress of the profession, long shifts, fatigue, physical and emotional pain, along with easy access to controlled substances, contribute to why nurses might divert controlled substances.

It's essential to recognize that due to the limitations of the scope of data included in our analysis, this proves that there are more news articles reporting nurses' involvement in diversion, and not that nurses are involved in 41% of all diversion activity.

Our analysis made it clear that there is no unified approach to imposing sanctions on nurses charged with diversion. While there was insufficient data

available to quantify the breakdown of nurses whose licenses were revoked versus those whose were not, <u>there is anecdotal evidence</u> of nurses who were convicted of misusing or abusing controlled substances in years prior, keeping their licenses, continuing to practice, and being accused again years later of diversion activity. However, in other cases, nurses were immediately stripped of their licenses, preventing them from practicing again.

Doctors were found to be the second most common diverters, involved in 26.32% of cases for which there is data. Unlike nurses who administer medication, doctors order them, giving them another powerful channel for interacting with controlled substances. Like nurses, doctors face similar challenges that might lead them to engage in diversion - high stress environments, long shifts, and, increasingly, burnout.

Pharmacists are in charge of dispensing and filling medications, and advising doctors and nurses on medication decisions, so they also control a significant stage in the lifetime of a controlled substance. Pharmacists were involved in 6.65%, and pharmacy technicians, who assist pharmacists in a range of tasks, were involved in 5.26%, making their combined involvement 11.91% of incidents.

Employees, a generic title used in articles where specific job function was not provided, were involved in 12.19% of incidents, but we can assume these include both care providers and non-care providers at healthcare organizations.

Understanding why certain healthcare roles might be more likely to divert than others can help guide healthcare organizations' decisions on where to invest in and expand educational efforts that are part of their drug diversion programs.

91.76% of incidents involved opioids

While there were a total of 48 prescription drug types involved in the identified incidents, certain types were more common than others. 267 incidents included information on drug type. The three most commonly

involved drugs were oxycodone (109 incidents), hydrocodone (73 incidents), fentanyl (55 incidents), which are all controlled substances and opioids. In fact, of the incidents for which we have data on drug type, 91.76% involved at least one opioid. 15.36% of incidents involved at least one type of benzodiazepine. Although not the full list, other types of prescription drugs included adderall, carisoprodol, codeine, cocaine, ketamine, lidocaine, metolazone, methadone, propofol, sertraline, tramadol, and zolpidem.
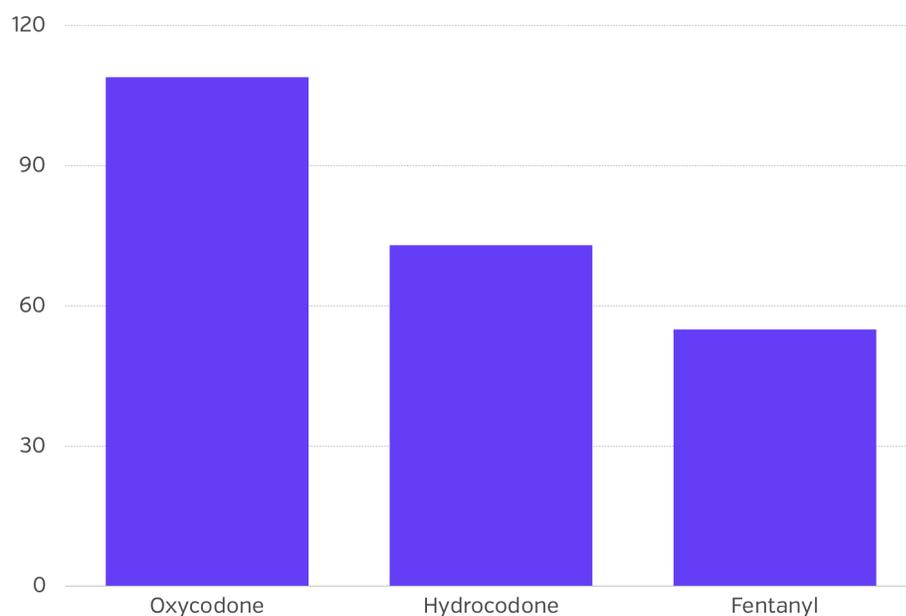

Figure 3: Number of incidents involving the most commonly diverted controlled substances, 2017 public drug diversion incidents

This information reinforces healthcare organizations' current practice of monitoring narcotics usage more closely than other drug types. In an ideal situation, organizations would monitor 100% of transactions across all drug types because all instances of diversion pose a danger, but this might not be possible from the outset. Our analysis confirms that focusing on narcotics, and specifically opioids, is a wise place to start.

Across 45 incidents, $301.1M lost to organizations and payors

Diverters

Because drug diversion is a criminal offense, diverters can face consequences that include time in prison and fines. Potential maximum jail time information was available for 57 incidents, and on average, diverters could face up to 11.21 years in prison. It's important to note here that we only included numbers on incidents that explicitly noted the actual or potential total jail times, and excluded life sentences and incidents that listed potential individual sentences for a list of charges.

Fines imposed upon diverters, which ranged from hundreds to hundreds of millions of dollars, were another potential consequence given to diverters. 32 incidents included information on fines, and the average fine was $201,776. This is much higher than the median fine of $17,500 due to a few especially large potential fines. Like jail time, we included incidents where the maximum total fine was specified and excluded ones that listed potential fines associated with each charge.

Beyond criminal consequences imposed upon diverters, they also face enormous threats to their health and well-being. It's widely believed that most diverters steal drugs for self-use rather than resale. 10-15% of healthcare personnel will misuse drugs or alcohol at some point during their careers.

In one case from our report, a doctor was found unconscious on a bathroom floor after he overdosed on (but survived) a powerful sedative he stole from one of the operating rooms at the hospital where he worked. He had been abusing fentanyl for months prior to this unfortunate incident. Had the institution been able to detect the doctor's abnormal user behavior within the hospital's systems, it's likely they could have prevented this incident from escalating to the level of severity it did. In a time when drug overdoses are the leading cause of death for Americans under 50 and accounted for the deaths of 64,000 people in 2016, it's essential that healthcare organizations invest in solutions that contribute to reductions in this number.

Patients

Drug diversion poses a great deal of harm to patients because it puts them at risk of being treated by care providers working under the influence of controlled substances as well as receiving the incorrect amount or type of medications. While essentially all drug diversion cases involve some sort of drug theft, many cases involved healthcare workers physically stealing pills, resulting in patients receiving lower amounts of their medication. In one case, the director of an assisted living facility was taking hydromorphone and Xanax from residents. Interestingly, public records show she was convicted of a similar charge six years ago, so it's curious that she was able to obtain this position.

Drug tampering, where healthcare workers alter the state or type of drug prescribed to the patient, can present even more nefarious situations. A tampering incident could involve a healthcare worker replacing a narcotics prescription with less potent pain relief medication such as Tylenol or ibuprofen. To provide an example of this, in one incident from the report, a home health nurse was accused of stealing prescription medication from an 82-year-old women battling stage IV liver cancer and replacing the painkillers with Tylenol.

Organizations

Diversion incidents have numerous impacts on the organizations where they occur. These include costs that are hard to quantify such as reputational damage and the number of patients who no longer seek treatment at an institution due to this damage. Two impacts of diversion on organizations where they occur are relatively easy to quantify: the numbers of lost pills or dosages, and the monetary worth of lost controlled substances and fraud against a payor. Organizations lost 20.9M pills or dosages to diversion incidents, a number that is based on data from 87 incidents. The average monetary amount lost to organizations from the worth of prescription drugs and to payors from prescription fraud was $6.69M, which is based on 45 incidents. Similar to the case with fines, this average is much higher than the median of $565,000 due to a number of prescription fraud incidents of particularly large magnitude. The total sum of dollars lost was $301.1M. This

is not an inconsequential sum of money, and it's unfortunate to see such a large quantity of resources directed away from patient care.

What's happening in Florida and Pennsylvania?

While it's certain that healthcare workers divert controlled substances in every state, 22.13% of diversion incidents included in our analysis happened in two states: Florida and Pennsylvania.

42 incidents occurred at healthcare institutions in Florida. Seven years ago, the state was known as the nation's pill mill capital, and 98% of the top 100 opioid-prescribing physicians were in Florida, according to the DEA. However, over the last few years, doctors across Florida have started prescribing fewer narcotics following a state-wide crackdown targeting pain clinics. A policy banning doctors from dispensing opioids directly from pain management clinics and the implementation and growing usage of prescription drug monitoring databases have been the core drivers of this change.

Pennsylvania was close behind Florida, with 39 incidents reported in the news. In 2017, the state's Attorney General Josh Shapiro said that "arrests of doctors, pharmacists, and others in health care accused of illegally diverting prescription drugs [were] up 40 percent, as his office cracks down to combat the opioid crisis across the state."

Although these two states are involved in high percentages of incidents included in our analysis, this doesn't mean that they experience higher rates of diversion than other places. Additionally, the fact that reporting requirements for drug diversion incidents vary state-by-state is another potential reason behind the variances in number of incidents per state.

The longest diversion incident went undetected for 12 years

Catching diversion incidents right after they start means that less harm is done to all parties involved. We collected data on the number of months a healthcare worker engaged in diversion activity for 120 incidents, and the

results show that healthcare organizations still have a lot of work to do when it comes to quickly catching diverters. It took an average of 17.8 months between the time individuals started and stopped diverting. One incident, involving a doctor who prescribed the most controlled substances of anyone in Pennsylvania between 2016 and 2017, occurred across 12 years.

This suggests that institutions lack proper mechanisms for detecting diversion incidents if they are unable to do it in near real-time. More on this in the next section.

Building an interdisciplinary and technology-driven approach to drug diversion monitoring

This analysis makes it clear that healthcare organizations have a long way to go in detecting and preventing drug diversion activity carried out by their employees. While we're seeing more health systems develop advanced drug diversion monitoring programs, organizations can always do more.

Developing an interdisciplinary approach

Framing drug diversion as an interdisciplinary issue is an important step in building a robust program that tackles hotspots of institutional vulnerability and reduces the numerous risks posed to diverters, patients, and organizations. Our work with health systems has taught us that while drug diversion programs most frequently fall within the purview of pharmacy departments, interdisciplinary teams that bring together leaders from multiple teams can most effectively detect and prevent diversion. John Burke shares additional insight into the role that these teams should play within a healthcare organization. He notes that "health facilities need to formulate what can commonly be called a Drug Diversion Team. This team is typically comprised of pharmacy, nursing, legal, safety and security, human resources, and more, and is designed to be quickly assembled when a medication discrepancy is unresolved after 24 hours, or an obvious incident of diversion has occurred. They can then examine the discrepancy or diversion and initiate a plan of action. They should critique themselves after every incident

to see if it was handled in the best interest of the patient and employee, and if not, suggest and implement changes for the future."

Building a culture of awareness

Educational programs that teach employees to identify possible signs of colleagues engaging in drug diversion present a low tech and low cost but highly effective way to detect diversion activity. Because of this, in addition to surveillance and monitoring systems, building a culture of awareness that teaches employees to recognize and report unusual behavior by coworkers must be an organizational priority.

Leveraging artificial intelligence-powered technology to review 100% of transactions

While an interdisciplinary team and educational programming are essential components of any drug diversion program, they should not be the only program components. Monitoring technologies offer an approach that is undergoing an especially exciting transformation.

Tools for addressing drug diversion have historically required extensive investment in terms of time spent reconciling data from many sources, and sifting through this data to identify signals that could point to diversion incidents, a process that emulates looking for a needle in a haystack. When a pharmacist or analyst does find something, it's often a false positive.

However, the industry is finding that there's a better way to monitor and prevent drug diversion as technologies that leverage artificial intelligence and big data analytics become available. These technologies can have far-reaching implications on current drug diversion programs in the following ways:

- They give teams an unprecedented ability to understand every provider's normal prescribing behavior in order to recognize anomalous behavioral patterns. These insights can allow teams to detect certain types of diversion activity that were impossible to detect using less advanced technologies.
- These solutions analyze transaction information in real-time. Catching incidents early-on before they harm the diverter or patients is critical for keeping providers and patients safe. These sorts of technologies have the

potential to reduce detection times from months or even years, as this report discloses, to minutes.

- Artificial intelligence enables organizations to audit 100% of controlled substance transactions, ensuring that nothing goes unnoticed. Until every transaction is analyzed, potential harms to providers and patients will remain widespread.
- Automated reporting can have information on cases brought to your attention rather than necessitating hours of work assembling disparate information and gathering facts.

Today, we are only capturing the tip of the iceberg in terms of what is reported versus what is known, and what is known represents a only fraction of what is actually happening. To solve the first problem, we must continue to aggregate and provide more public sector data on these events in order to understand and thwart patterns of dangerous behavior. We are, to this end, working to request more information from public sources to build a more comprehensive data set. To solve the second problem, regulatory bodies must mandate the deployment of analytics and tools that accurately and comprehensively review 100% of controlled substance transactions.

Methodology

The purpose of this section is to explain decisions that were used to guide our analyses.

To identify incidents included in this report, we engaged in two key processes. From November 2017 through the end of the year, we used daily alerts to track the mention of a number of keywords related to drug diversion by healthcare workers. To identify events reported earlier in the year, we entered the same keywords into public search engines to retrospectively identify news articles published in 2017. In reports moving forward, we will rely on daily news alerts on our batch of keywords to aggregate articles, and cross-check and update this methodology as appropriate. We will note such updates in future methodology sections.

Based on the results that these searches populated, we included incidents that fell within our definition of drug diversion: the transfer of drugs by healthcare workers from a legal use to an illicit one.

From here, we further narrowed our results based on the following criteria. Incidents must have:

- Involved a healthcare worker being discovered, reported, accused, charged, arrested, or sentenced for drug diversion activity in 2017. Incidents where someone was charged prior to 2017 were not included in the report even if there were news articles published about them in 2017.
- Occurred within the United States
- A healthcare employee is doing the diverting

Incidents noted in the Medicare Fraud Strike Announcement were not included in this report unless we found a specific article about the incident, could confirm that it involved drug diversion activity (as opposed to healthcare fraud more generally), and fell within the rest of our parameters.

We included incident information according to the following definitions:

- Jail time: Jail times included in our report encompass real or potential sentencing lengths imposed upon diverters. Incidents explicitly noting the total possible or given sentencing length were included. Incidents providing potential sentences for a number of individual charges were excluded.
- Fines: Fines included in our report encompass real or potential fine amounts imposed upon diverters. Incidents explicitly noting the total possible or real fines were included. Incidents providing potential fines for a number of individual charges were excluded.
- Pills and dosages: Incidents reporting the total amount of lost pills or dosages were included. When a possible range was noted, the average of the two numbers was used. Numbers of vials or prescriptions were excluded due to the range of quantities that these might refer to.
- Worth of diverted controlled substances: Incidents reporting the total worth of the diverted controlled substances diverted were included. When a possible range was noted, the average of the two numbers was used.

- Healthcare worker role: For cases involving numerous individuals occupying a variety of healthcare roles, the role of the incident leader or specific role of the charged individual was included.

Disclaimer: This report is made available for educational purposes only and "as-is." Although we have tried to provide accurate information, as new information or details become available, any findings or opinions in this paper may change. We welcome feedback as well as additions of incidents we might have missed. Despite our diligent efforts, we remain convinced that the incidents included in this report are only the tip of a very, very large iceberg, and any patterns we see in publicly disclosed incidents may not mirror what goes on beneath the tip.

About Protenus, Inc.

The Protenus healthcare compliance analytics platform uses artificial intelligence to audit user behavior in electronic health records and pharmacy systems for the nation's leading health systems. Providing healthcare leaders full insight into how health data or controlled substances are being used, and alerting the right team of this inappropriate activity, Protenus helps our partner hospitals make decisions about how to better protect their data, their patients, their workforce, and their institutions. Learn more at protenus.com and follow us on Twitter @Protenus.