

Case Study

Implementation of Technology to Prevent Diversion of Narcotic Waste

UW Health – Madison Wisconsin



Summary

In 2015, leaders in pharmacy, compliance and nursing at UW Health, Madison, WI, decided it was time to change how staff disposed of narcotic waste – the unused doses and used patches that can be diverted to illicit drug use. Past practices involved a number of inefficiencies as well as potential harm to the environment. A major drug theft in 2014 at the system's flagship hospital gave the team a "burning platform" on which to build a business case for a new solution. Following a review of various technologies, the Cactus Smart Sink System was chosen.

The Cactus System, now a part of the Stryker product portfolio, securely captures unused pharmaceutical waste and renders it unusable and non-retrievable. From a compliance perspective, Cactus eliminated disposal of non-hazardous waste into sewers, while meeting the standards of the Joint Commission, the state Department of Natural Resources and the federal Drug Enforcement Administration. It also averted a seven-figure spend for new sinks that would have been required if Cactus had not been implemented. It made drug diversion significantly more difficult, and it meshed with nurses' workflow.

About UW Health

- The integrated health system of the University of Wisconsin-Madison, UW Health has 1,500 physicians and 16,500 staff serving more than 600,000 patients each year.
- The flagship is University Hospital, a 505-bed regional referral center that is home to a Level One adult and pediatric trauma center; one of the nation's largest organ transplant programs; and UW Carbone Cancer Center, one of 41 National Cancer Institute-designated centers.
- The system also includes UnityPoint Health-Meriter, a 448-bed community-based hospital providing a complete range of medical and surgical services, American Family Children's Hospital, a nationally-ranked, 87-bed facility with pediatric and surgical neonatal intensive care units, and more than 80 outpatient sites.

The Challenge

The U.S. is facing an opioid epidemic that has quadrupled the number of opioid deaths over the past decade. Every day, more than 90 Americans die after overdosing on opioids, which include prescription pain relievers, heroin and synthetic drugs such as fentanyl.¹

Although a relatively small fraction of the nation's drug supply is administered in hospitals and outpatient surgery centers, the nature of hospital care provides ample opportunity for drug diversion. Data on the true extent of narcotic theft from healthcare facilities is not known, but opioids are the most common drugs stolen from those settings.

According to a report from the Mayo Clinic,² examples of common incidents from across the country include:

- A procedural sedation nurse assigned to administer opioids and sedatives to patients during colonoscopy was found to have a secret pocket sewn inside her uniform top, into which she

dropped syringes of fentanyl and substituted them with syringes containing saline solution.

- A radiology technician who was positive for hepatitis C diverted unused fentanyl syringes intended for patients in interventional radiology. It is believed that the technician would remove the needle from a syringe, replace it with a smaller gauge needle for self-injection, and then reattach the original needle to the syringe. The technician infected five patients with hepatitis C.
- Sharps waste containers were found hidden in hospital areas where they did not belong. Video surveillance showed an employee blindly sticking her hand over and over into a full sharps container, with predictable results.

Closer to home, a 2015 review of state records showed 104 Wisconsin nurses had been disciplined over a two-year period for either stealing narcotics or being intoxicated on the job.³

UW Health has seen its share of drug diversion; the biggest case occurred in 2014 when a nurse was arrested by police following an internal investigation that included video surveillance evidence of her stealing from the automated medication dispensary. She admitted more than 40 instances of removing morphine and hydromorphone from vials and then refilling them with water, all without using gloves. Patients were then injected with the water from non-sterile needles, and several got infections.^{3,4}

As important of a problem as drug diversion is, it was not the only one that caused leaders of UW Health to look for a new way of disposing narcotic waste. Nurses had expressed concern over the environmental impact of dumping narcotics into the sewer system, even though that was the policy established by the U.S. Drug Enforcement Administration. Studies have shown that some pharmaceuticals survive the water treatment process and are found in diluted form in the drinking water supply.

Nurses trying to abide by the rules for wasting unused drugs from syringes had run into several problems. One was a lack of sinks near the medication dispensing stations. “Before Cactus we had people shooting syringes into sharps containers, wastebaskets or onto paper towels, thinking that made the drugs non-recoverable, but they were still recoverable,” said Kristen Jurakovich, UW Health’s internal auditor of narcotic control. The same problem was found in solid wastes. “You saw fentanyl patches being dumped into wastebaskets, where they can easily be found. When you read

of people fishing patches out of toilets, you realize what a problem this can be,” she said.

Another issue in complying with policy was the ability to find a second nurse to witness the wasting process. Nurses don’t work in pairs, and having to find another nurse with time to search around for a place to waste was cumbersome and inefficient, leading to the noncompliant, ad hoc disposal seen previously.

When they make their unannounced visits, Joint Commission surveyors look for policies and procedures that ensure controlled substances are disposed of in a non-retrievable fashion, and base their findings on how well staff adhere to those rules. “We had some appropriate locations identified in our policy for our frontline staff to waste, but for a variety of reasons, our compliance was not where it should be,” said Aaron Webb, PharmD, MS, Pharmacy Manager, Patient Care Services and Operations at UW. “We needed a solution that would limit harm to the environment, and also provide a more predictable, convenient and controlled process for nurses, physicians and pharmacists to be able to waste. If you make it easy for them, they are more likely to do what you need them to do.”

An interdisciplinary team of leaders from pharmacy, compliance and nursing was formed to evaluate the options in the marketplace and recommend a solution to senior leadership. Heading up the effort was Sarah Emanuele, PharmD, Medical Systems and Operations Coordinator in pharmacy, who is responsible for all pharmaceutical waste across the system.

The team sought to define a value equation for its decision based on a solution's ability to render substances non-retrievable. Guidelines included:

- The product's capability to handle solid as well as liquid wastes
- The cost impact of the capital spend and ongoing operation
- Ease of implementation
- Ease of use
- Security of the container

Experience

Stryker's Cactus Smart Sink System securely captures unused pharmaceutical waste and renders it unusable and non-retrievable – ensuring discarded medications do not end up in the wrong hands or negatively impact the environment. It is designed to accept raw liquid pharmaceuticals directly from syringes, vials or IV bags, and features a one-way funnel that accepts tablets, capsules and scored patches.

The outer case houses two replaceable cartridges, one for liquid waste and one for capsules, tablets and patches. The cartridges contain a proprietary mixture of chemicals and deterrents for liquid waste; it converts the liquid waste into a semi-solid state.

Once the decision was made to go forward with a test of the Cactus system, the team developed a nursing satisfaction survey around controlled substance waste disposal, because nurses are the primary handlers of narcotic waste. "We wanted to

understand their level of knowledge about what our current policies and procedures were, as well as to understand their level of satisfaction with those practices," Webb said. "We were surprised by survey results that showed many nurses were not aware of an appropriate place to waste medications or were simply doing what seemed most convenient."

The team decided to start with a pilot in the emergency department of the flagship University Hospital. "We quickly learned you can't just put a system out there and expect people will know how to use it," Emanuele said. "People had to have training and we needed to more clearly state things such as, 'You can't throw bottles or syringes in the Cactus.'"

An online training module was created by a nurse coordinator, and stickers were affixed to the units so everyone is clear on what goes where. A system of fingerprint bio IDs was established so that every time a nurse takes unused drugs back for wasting there is a record of that nurse and the witness.

There are unique identifiers on the Cactus cartridges, so pharmacy can track them from arrival to departure to a hazardous waste incineration facility. One pharmacy technician installs the cartridges and another picks them up, so no one has sole control of the materials.

The notification system has an audio alarm as well as a visual cue in the form of a blinking light to signal the cartridges are full.

Controlled substance waste from operating rooms is placed in a drop box at the end of each case. The drop box is badge-accessed by the OR pharmacist the next morning, who is accompanied by a second staff member acting as a witness. They enter information about the contents on a sheet of paper. The material is then brought to the central pharmacy, where the two pharmacists verify that what is in the bag is what it says it is on the paper. If there is a discrepancy, it is flagged and an investigation ensues. Once the verification process is complete, the contents are placed into a Cactus Sink at central pharmacy, an act that is again witnessed and signed off.

Conclusion

Compliance with narcotic-waste documentation and witnessing is higher now.

References

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