

Nurse AdviseERR®

Educating the Healthcare Community About Safe Medication Practices

Partially filled vials and syringes in sharps containers are a key source of drugs for diversion

A 36-year-old hospital care aide (nursing assistant) who had been diverting discarded drugs died after self-administering what she likely thought might be an opioid but was actually a neuromuscular blocking agent.¹⁻³ The aide had found an unlabeled syringe containing a clear solution in a biohazard box, injected the solution, and suffered immediate paralysis, respiratory arrest, and then death. The aide's death happened in Vancouver, Canada, and it's a very sad and cautionary story that should serve as a wake-up call to all US hospitals to take the necessary steps to prevent and detect the theft and abuse of hospital medications.

The Story

According to news reports,^{1,3} the aide, Kerri O'Keefe, had worked in the emergency department (ED) for about 15 years, and by all accounts, she loved her job and was extremely well-liked and respected by her colleagues. She had a long history of drug and alcohol dependence and had been placed on leave twice before, but was allowed to return to work after stints in rehab. However, she concealed the breadth and depth of her addiction from both her family and her colleagues and friends at work. When Kerri did not show up for a planned family event, her mother went to her apartment and was shocked to find her daughter dead and her apartment littered with an arsenal of used syringes, vials, needles, and tourniquets. Many of the syringes included patients' names and dates. Investigators also found stolen urine samples from patients in the refrigerator, presumably to use if she was asked to provide a urine sample for drug testing.

The hospital had numerous physical controls in place to prevent unauthorized access to controlled substances in automated dispensing cabinets (ADCs), locked cabinets, and pharmacy vaults. The hospital also required periodic counts of controlled substances and documentation when removing them from storage locations. Kerri was able to gain access to drugs despite the existing safeguards because she stole discarded syringes, vials, and patches that contained leftover drugs from biohazard boxes. Most boxes were attached to the outside of locked cabinets but could be easily removed.

Based on the drug supplies found in her apartment, it appears Kerri would collect a stockpile of medications, especially leftover morphine and fentaNYL, and then secretly inject the medications at home. It appears she also self-injected drugs in unlabeled syringes, perhaps hoping the drug was an opioid, but on the day of her death, the drug was rocuronium. The unused syringe containing the neuromuscular blocking agent had been discarded in a biohazard box after a planned intubation in the ED was cancelled. According to investigators, the aide had been stealing entire biohazard boxes or emptying the boxes into a backpack or small suitcase on wheels that she routinely took to work.¹⁻³ Despite security cameras, her actions were never discovered prior to her death. Based on news reports, Kerri's August 2015 death occurred around the time that she was due to take another leave of absence to attend a third round of rehab for her addictions.

Alarming Statistics

Drug overdoses are the leading cause of accidental death in the US, and opioid addiction is driving this epidemic⁴ with more than 18,893 overdose deaths in 2014. Of

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ISMP We need your input!

A draft set of guidelines to facilitate the **safe use of subcutaneous insulin** has been posted to our website for public comment. The guidelines were developed after ISMP held a national summit in November 2015 during which participants identified the risks with subcutaneous insulin and recommended guidelines for safe use across the continuum of care. To view and comment on the draft guidelines, visit: www.ismp.org/sc?id=1707. Public comments will be accepted until **April 30**. The final document will be available on ISMP's website. Funding support was generously provided by BD.

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the 21.5 million Americans 12 years or older who had a substance use disorder in 2014, 1.9 million involved prescription pain relievers; far less were abusing heroin.⁵ The latest data from the US Substance Abuse and Mental Health Services Administration showed that about 1 in every 10 health professionals is struggling with addiction or abusing drugs not prescribed for them.⁶ Very few healthcare workers who are diverting and abusing drugs are ever caught, often despite clear signs in physical appearance, thoughts and behavior, and performance. The American Nurses Association reports the same—about 10% of nurses are thought to be abusing drugs and may be caring for patients while impaired.⁷ These rates mirror the incidence seen in the general population, meaning healthcare workers are not at higher risk of drug abuse than the general population. However, the overall pattern of drug abuse and dependency with healthcare professionals is unique.⁸

Unique Dependency Pattern

Studies have shown disproportionate misuse of prescription drugs by healthcare professionals when compared to street drugs, primarily because they can access prescription medications easily and often.⁹ Another pattern with healthcare workers is that drug abuse tendencies arise based on the drugs readily available to the worker.¹⁰ In addition to personal or family stress, dealing with patient illness, harm, death, an unpredictable work pace, heavy work demands, and long hours can make stress alleviation through drug use an attractive and convenient coping mechanism for healthcare providers.^{10,11} These stresses have led many healthcare workers to use tobacco and alcohol as a legal way to relax and unwind after work. But reliance on these legal but addictive substances can be a “slippery slope” leading to prescription drug abuse and subsequent addiction.¹⁰ While some healthcare professionals have a misconception that their knowledge of the drug will help them “control” its use,¹¹ it’s a very short distance between misuse and dependence for many.

Risks to Patients and Workers

Drug diversion and abuse puts patients at risk for suboptimal treatment from diluted or substituted medications, serious infections caused by contaminated needles and syringes, and errors committed by health professionals who are working while impaired. The toll can also be brutal for the impaired healthcare worker who is abusing prescription drugs.¹² Many healthcare workers feel guilt and despair, suffer physical and mental health issues, and may be indifferent to the risk of death from an overdose.

Safe Practice Recommendations

The systems for preventing and detecting drug diversion, and dealing with workers who are battling a prescription drug dependency, are clearly insufficient given the current scope of the problem. Inadequate monitoring systems and lax controls leading to diversion also result in significant fines levied by the government.¹³ The real challenge is striking a careful balance between recognizing addiction as a disease, and taking steps to prevent patient and employee harm. Without getting into the controversies that surround the debates about whether to apply a “crime and punishment” model of accountability for drug abusers, or remove the stigma of drug abuse so practitioners who need treatment will seek it, the following recommendations, while not exhaustive, can help begin the long journey to a reduction in drug diversion and abuse.


Awareness and Recognition of the Problem

Expect diversion. Given that one in 10 healthcare practitioners/workers will abuse drugs, take all the necessary steps to prevent and detect it. No news is NOT good news when it comes to drug diversion and abuse.

Observe for signs of impairment and diversion. Educate all healthcare workers to recognize diversion and a drug-impaired coworker. Here are some signs and symptoms:

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SAFETY wires

 **Kayexalate or Kay Ciel?** When a pharmacist received an order for potassium chloride (KCl) oral liquid 30 mEq, she first checked the patient’s potassium level. It was 5.8 mEq/L, so for clarification, she called the nurse who received the order from the prescriber. The nurse actually meant to select **KAYEXALATE** (sodium polystyrene sulfonate), not **KAY CIEL** (KCl), when entering the prescriber’s telephone order. When the error was investigated, the pharmacy found that when you typed the first 3 letters of Kayexalate, “KAY,” into the order-entry system, two options appeared alphabetically. The first was KCl liquid (Kay Ciel) and the second was Kayexalate. The first option had been mistakenly chosen by the nurse. This is particularly dangerous since potassium is about the last thing you would want to give a hyperkalemic patient.

Actually, there are two additional, nearly identical cases known to ISMP and the US Food and Drug Administration (FDA). One involved Kay Ciel, a former brand name for KCl oral liquid and powder. The other involved a label placement error in which a label for Kayexalate was placed on a bottle of KCl liquid by mistake. Although the dose (120 mL) was appropriate for Kayexalate, it was a massive overdose for KCl. The patient took two doses before winding up in a hospital emergency department (ED), where he coded and could not be resuscitated.

The name Kay Ciel is still widely listed on the Internet and appears in some drug information references, including *Micro-medex* and other indexes, even though Kay Ciel liquid was discontinued in 2005, as were Kay Ciel powder packets in 2008.

The hospital where this error happened is reaching out to its information technology (IT) staff to eliminate Kay Ciel as a choice, a step that could have been taken sooner if the system had required more frequent updates to remove medications no longer available. Decision support via linkage to the latest serum potassium level when ordering any potassium supplement might also be an

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- Increasing isolation from coworkers and social avoidance at work
- Frequent illness, accidents, emergencies, tardiness
- Complaints from others about poor work performance
- Moody, depressed, irritable, suicidal threats
- Frequent trips to the bathroom, locker room, unexplained absences, long lunches
- Illogical or sloppy charting
- Volunteers frequently to work overtime on off shifts when less staff are around

Physical signs^{10,11}

- Shakiness, tremors, slurred speech, sweating, unkempt appearance
- Wearing long-sleeve clothing even in warm environments

Signs of diversion

- Frequent incorrect controlled substance counts
- Large or inconsistent amounts of wasted narcotics
- Discrepancies between patient-reported pain and pain medication administration
- Increase in the amount of drugs needed on the unit or in the pharmacy

Report suspicions. Establish an organizational expectation to report suspected drug diversion and worker impairment via a confidential process (e.g., hotline).

Educate about resources. Routinely provide staff education regarding the resources available if diversion is suspected or a practitioner wants to seek treatment for addiction.

Drug Security and Chain of Custody**Secure controlled substances at all times**

- Before leaving the medication preparation area, secure vials containing leftover controlled substances yet to be discarded. Walking away to administer a dose or attend to a task without securing the vial can invite diversion.
- Prohibit drawing more than a single dose of a controlled substance into a syringe; saving partial doses in syringes exposes the drug to possible diversion.
- Remove controlled substances from an ADC close to the time they are needed for a procedure or for administration. Avoid removing a drug “just in case” it is needed. Never carry controlled substances around in your pockets.
- Secure all controlled substance infusions in locked infusion pumps, and require a witness to observe the waste once the infusion is removed from the pump.
- Secure the patient’s home medications immediately after collection.
- Secure controlled substances in the operating room, procedural areas, and anesthesia work areas during and between surgical cases. During procedures, require reconciliation of controlled substances before and after hand-offs and breaks.
- Require staff to log off from an ADC before leaving the medication station and to never share their user identification or passwords with coworkers.
- Do not pass off controlled substances to others to administer or waste.

Manage inventory. Require staff to verify dispensing and receipt of controlled substances. In areas without ADC storage, the person delivering and the person receiving these drugs should each cosign on the appropriate record, and the drugs should be immediately secured. When using ADCs for dispensing and storage of controlled substances, activities should be tracked and reconciled using data available in the vault software.

Use the correct containers. Know the federal, state, tribal, and local laws regarding pharmaceutical wastage of controlled substances, hazardous waste, and sharps, and choose the most appropriate and secure containers for safe disposal.

Secure and track sharps/pharmaceutical waste containers

- In patient care areas, use sharps/pharmaceutical waste containers with small openings that do not easily allow medication devices or waste to be shaken

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error-reduction strategy. But even if hospitals don’t have the brand name Kay Ciel listed as a choice, people may still incorrectly associate “KAY” with KCI. By the way, hats off to the pharmacist who checked the patient’s laboratory results before dispensing the potassium products. It might have been missed by others who have not built that check into their routine.



Updated standards. The Infusion Nurses Society (INS) has recently updated the *Infusion Therapy Standards of Practice (2016)* (www.ismp.org/sc?id=1688). The *Standards of Practice* are also available in an eBook format for instant download (<http://ins.tizrapublisher.com>). The *Standards* encourage nurses to report medication errors to the ISMP National Medication Errors Reporting Program ISMP MERP: www.ismp.org/MERP. INS also published *Policies and Procedures for Infusion Therapy, 5th Edition*, in 2016, which is available at: www.ismp.org/sc?id=1689.



Ambiguous abbreviation B-L-D. One reader contacted us about a near miss. A nurse transcribed an order for **NO-VOLOG** (insulin aspart) **FLEXPEN** 20 units with the frequency of administration written as “c B-L-D” as part of the order. The pharmacist initially misread the “B-L-D” as “BID,” but upon further review prior to submitting the order, he noticed the hyphens placed between the letters and requested clarification. Apparently, the nurse had written the abbreviation “B-L-D” to mean with breakfast, lunch, and dinner.

This is the first time we have received a report involving this abbreviation. Even so, if not already done, this would be a good time to ban this abbreviation and to send out a reminder to prescribers that B-L-D should never be used in handwritten or electronic orders or prescriptions. Ambiguous abbreviations should be avoided when communicating drug and patient information. Pharmacists should not dispense and nurses should not administer medications until ambiguities are clarified with the prescriber.

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out. (Some pharmaceutical waste containers [e.g., Cactus Smart Sink] render narcotics unrecoverable, non-retrievable, and unusable.)

- When a larger sharps/pharmaceutical waste container must be used (e.g., OR, procedural areas), utilize video cameras nearby and regularly observe the monitors.
- Lock sharps/pharmaceutical waste containers to the wall or secure to other stationary equipment that cannot be easily removed from a clinical unit. Secure all keys to replace a container, and limit access to just a few designated staff (or an external company that may collect and replace the containers). Establish a process to track and reconcile all containers to ensure detection of unauthorized removal (some containers have barcodes). Restrict access to stock of empty back-up containers.
- Place containers in areas where they can be consistently observed or monitored by a video surveillance system. If a container must be removed from a secure wall unit or its usual location because it is full, establish a secure holding area while awaiting proper pick-up for disposal.

Restrict access to controlled substances

- Establish strict guidelines regarding who can have access to controlled substances, including those stocked in ADCs, pharmacy vaults, treatment kits, and areas where expired drugs are stored.
- Rotate staff who manage procurement, storage, and distribution of controlled substances so diversion can be discouraged and/or detected sooner.
- Adjust par levels of controlled substances in the pharmacy (including satellites) and on patient care units based on use rates so excess supplies are not available.
- Place each type of controlled substance (including opioid infusions) in ADCs in a separate lidded compartment or area so only access to the intended drug is granted.
- Allow access to medications in clinical areas for only current patients on that unit.
- Limit individuals who can add new patient profiles to the ADC software.

Reduce waste. Provide controlled substances in dose sizes that eliminate or minimize waste (e.g., provide a 2 or 5 mg syringe of morphine instead of a 10 or 15 mg syringe).

Monitor prescription pads. Establish a process to secure, track, and reconcile all prescription pads used for controlled substances in patient care units.

Allow no bags. Do not allow purses, backpacks, briefcases, or other personal storage cases in areas where controlled substances are stored or discarded.

Safe Drug Disposal

While following all applicable federal, state, tribal, and local laws and regulations regarding the disposal of controlled substances, consider the following recommendations:

Remaining controlled substance left in a single-use vial: With a witness present, draw the remaining medication into a syringe, require the witness to verify the volume in the syringe, and then squirt the medication into a pharmaceutical waste box* while the witness watches. Do not discard the vial in the sharps box before removing and wasting any leftover medication from the vial.* Document the volume and dose of the pharmaceutical wastage, which should be verified and cosigned by the witness.

Extra or remaining controlled substance in a prefilled syringe: Require a witness to verify the volume in a prefilled syringe, then squirt the medication into
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*Squirting a controlled substance into the sink or toilet may not be an option in some states or safe for the environment. Squirting a controlled substance into a sharps box may not be permitted by the container company or the waste management company that disposes of the sharps containers.

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Infection control position paper. The Association for Professionals in Infection Control and Epidemiology (APIC) has released *Safe Injection, Infusion, and Medication Vial Practices in Health Care (2016)*. The position paper has several updated sections including, but not limited to, transporting medications in pockets and clothing, drug diversion, point-of-care testing and blood glucose monitoring, healthcare provider training, drug oversight and enforcement, and aseptic technique. This is an important document for all health professionals to read. The document can be found at: www.ismp.org/sc?id=1690.



Health Literacy Universal Precautions Toolkit. Only 12 percent of US adults have the health literacy skills needed to manage and navigate the complexities of the US healthcare system. Patient's ability to absorb and use health information can be compromised by stress or illness. Experts recommend assuming that everyone may have difficulty understanding in order to create an environment in which all patients can thrive. Healthcare professionals should take universal precautions to address health literacy because they have no way of knowing which patients are challenged by healthcare information and tasks.

The Agency for Healthcare Research and Quality (AHRQ) recently published the second edition of its health literacy universal precautions toolkit. The *AHRQ Health Literacy Universal Precautions Toolkit, Second Edition* (<http://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/index.html>) can help healthcare providers reduce the complexity of healthcare, increase patient understanding of health information, and enhance support for patients of all health literacy levels. We took a look at the various tools and found them very well done, particularly the slide sets with the speaker's notes. We encourage practitioners to put these tools into practice, and for healthcare professional schools to include them in the curriculum for students about to participate in clinical rotations.

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the pharmaceutical waste box* (see footnote on prior page) while the witness watches. Do not discard the syringe in the sharps box before removing and wasting any leftover medication. Document the volume and dose of the pharmaceutical wastage, which should be verified and cosigned by the witness.

Unused or expired controlled substance: Return the container of unused inventory to the pharmacy for disposal using a process that verifies delivery and receipt.

FentaNYL transdermal patches: Current manufacturer and US Food and Drug Administration (FDA) guidelines direct users to fold the patch in half with the sticky sides together, and then flush the patch down the toilet. If flushing the patch is not an option, a device that deactivates any remaining drug in the patch should be used prior to disposal. Deactivation and disposal should be documented with a second witness.

Selected high-alert medications: For selected high-alert medications (e.g., neuromuscular blocking agents, concentrated electrolytes), follow the same disposal procedures used for controlled substances, although witnessing waste may not be necessary.

Inventory disposal: Establish a witnessed process for disposal of controlled substance inventory in the pharmacy by a pharmacist, or by an authorized third party.

Monitoring

Implement monitoring systems

- Allocate sufficient human resources for an interprofessional team to develop and oversee a controlled substance management and prevention program. Activities should include: ensuring proper documentation, conducting periodic documentation reviews and routine inventory counts, investigating all reports of potential diversion or an impaired worker and unreconciled counts or discrepancies, viewing footage of monitoring, and conducting observations of practices with controlled substances.
- Use recording surveillance cameras in high-risk areas where diversion might take place (e.g., narcotic vault, pharmacy IV room, ADCs) and review the monitors or footage regularly.
- Use software to monitor controlled substance movement in ADCs (e.g., Pandora) and pharmacy narcotic vaults (e.g., NarcStation, CIISafe).

Periodic documentation review. Establish a system for reviewing the documentation and use of controlled substances, paying particular attention to:

- Comparing removal of a controlled substance from an ADC or other storage location to the medication administration record
- Comparing the time of removing a controlled substance to the time of dispensing or administering the drug (delays could signal diversion)
- Comparing pain medication administration time to patient reported pain scales
- Documented pain medication administered to an unconscious patient
- Pain scores much higher when a particular staff member is on duty
- Frequent ADC overrides by a practitioner to gain access to controlled substances
- Irregular usage reports from ADCs and narcotic vaults

Observe staff. Regularly observe how staff manage controlled substances, including wasting drugs and other security processes. Also observe staff for at-risk behaviors such as badge sharing or unsecured drugs, and coach them to exhibit the desired behaviors.

Investigate immediately. Start an investigation as soon as it is learned that the count of controlled substances does not reconcile with documentation. The investigation should be completed before any staff member on the unit or in the pharmacy leaves the facility.

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