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ISMP An ECRI Affiliate

Acute Care
ISMP Medication Safety Alert!®
Educating the Healthcare Community About Safe Medication Practices

Leaving a discontinued fentaNYL infusion attached to the patient leads to a tragic error

Problem: A patient's death from a fenta**NYL** overdose in late 2019 came to our attention recently via the news media. The patient had been hospitalized after suffering a stroke. Although the patient's condition at first had improved, he later developed difficulty swallowing. After aspirating food and suffering an acute respiratory arrest, the patient was placed on a ventilator, during which he was sedated via an intravenous (IV) fenta**NYL** infusion (10 mcg/mL) connected to one of multiple channels on a smart infusion pump. Over the next several days, the patient received fenta**NYL** ranging from 25 mcg to 100 mcg per hour, with the dose titrated daily as needed for sedation. Several days later, the patient's physician discontinued the fenta**NYL** infusion in the morning, hoping to extubate the patient that afternoon. The pump channel infusing the fenta**NYL** was turned off, but the infusion container was left in place and remained connected to the patient's IV line.

Later that day, the smart infusion pump alarmed, alerting practitioners that a bag of Lactated Ringer's, which was infusing via a different pump channel, was near completion. A nurse filling in for the patient's primary nurse responded to the pump alarm, turned off the corresponding pump channel, retrieved a new Lactated Ringer's infusion, attached it to the correct pump channel, and programmed the infusion correctly. However, she accidentally restarted the fenta**NYL** infusion instead of the Lactated Ringer's solution. Although the pump alarmed, the nurse silenced it quickly, believing it had alarmed accidentally. An evening nurse caring for the patient also missed that the fenta**NYL**, not the Lactated Ringer's, was infusing. The rate of the fenta**NYL** infusion was not disclosed.

Several hours later, the patient's blood pressure had dropped significantly, and the error was recognized. Although the fenta**NYL** infusion was then quickly discontinued, the prolonged hypotension caused by the fenta**NYL** infusion caused serious brain and organ anoxia, and ultimately resulted in removing the patient from life support several days later.

Safe Practice Recommendations: Although ISMP has no additional details about the event other than what could be gathered through the news media, there are several risk-reduction strategies that we have previously recommended that might have prevented this error. It is our hope that, by sharing a brief description of this error, other hospitals will learn from it, assess their level of implementation of the following risk-reduction strategies, and enact plans to improve their use.

Disconnect and discard all discontinued or "held" infusion bags/syringes. Discontinued or "held" infusions should be immediately removed from the pump, disconnected from the patient, and discarded. Do not leave a discontinued infusion still set up via a stopped infusion pump that either remains connected to the patient and/or hanging on the patient's IV pole at the bedside. Also, the tubing should be changed if necessary to ensure no residual medication is left in the tubing, which could be inadvertently administered as a bolus when the tubing is used to administer other medications and fluids.

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SAFETY briefs

HIGH-ALERT

Confusion with InPen devices. ISMP received a report from an outpatient pharmacy regarding a close call with a product called **INPEN** (**Figure 1**). This is a Bluetooth-connected "smart" insulin pen system for mealtime insulins that is prescribed with either insulin aspart (**NOVOLOG** or **FIASP**) or insulin lispro (**HUMALOG**) U-100 cartridges. Once the pen is loaded with the cartridge, InPen is used along with a smart phone app to interact with continuous glucose monitoring systems, remind patients to use their insulin, and log and track insulin doses. It can also administer half-unit doses.

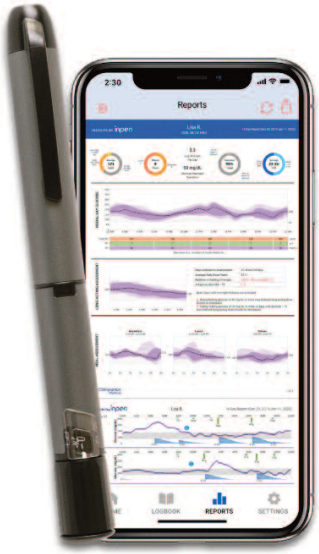

Figure 1. InPen device connects with a smart phone app via Bluetooth to help manage diabetes.

The report sent to us mentioned that an electronic prescription was received for "InPen (for Novolog or Fiasp) subcutaneous." Shortly afterwards, a prescription for the same patient was received for three Novo**LOG** U-100 3 mL cartridges. When a pharmacy technician went to the pharmacy's wholesaler website, there were six different InPen devices listed, each with a description of their color (blue, gray, or pink). The technician incorrectly assumed that the pens only differed by color. The pen labeled

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Label the tubing and pump channel. Labels with the name of the drug being infused and route of administration should be affixed to each access line (e.g., IV, epidural) at the distal end of the tubing closest to the patient and on the tubing above the pump or channel. If available as a pump feature, ensure the name of the infusion is clearly visible on the pump screen.

Trace the tubing. When parenteral infusions are started, reconnected, or changed (new bag or syringe), or the rate is adjusted, the tubing should be traced by hand from the solution container to the pump, and then to the patient for verification of the proper pump/channel and route of administration immediately *prior* to starting or changing the rate of the infusion.

Change of shift verification. Require oncoming nurses to verify all of their assigned patients' infusions, tracing the lines and inspecting the pump settings and infusion labels, and then matching each with current orders. This verification process is best performed together with both the oncoming nurse and the nurse finishing her shift for the assigned patient.

Manage operational alarms. For a variety of reasons, operational alarms may be overlooked or quickly overridden without careful consideration of the warning, including alert fatigue and poor design of the warning. To maximize the efficiency and response to operational alarms, establish the thresholds for frequency and duration, identify the top alarms by type and care area/profile, and determine if they are critical alerts. Remove non-critical alerts as needed to decrease alert fatigue.

Implement interoperability. Implement bi-directional (i.e., auto-programming and auto-documentation) smart infusion pump interoperability with the electronic health record to reduce the risk of pump programming errors.

Close calls—a sign of resilience or vulnerability? Odds are higher that vulnerabilities are reported

In the January 2021 issue of *The Joint Commission Journal on Quality and Patient Safety*, Jung et al. examined how the proximity of a close call to the averted failure (reaching the patient) impacted healthcare workers' psychological safety and willingness to report the event.[1] A close call (also referred to as a near miss) is an event, situation, or error that took place but was captured before reaching the patient. To cite one example of a close call, the wrong drug was dispensed by the pharmacy, but a nurse caught the error before it was administered to the patient.

Jung et al. note that reports of close calls contain contrasting clues or associations that highlight either *resilience*—we managed to avoid the failure and were successful in terms of the outcome—or *vulnerability*—we nearly failed in what transpired right before the averted outcome. They found that close calls that were caught early in the process were often perceived as successful because they were further away from the averted failure, thus underscoring a sense of *resilience*. In contrast, close calls that were caught later in the process were often perceived as near failures, thus underscoring a sense of *vulnerability*.

The authors emphasized that close calls were not processed and treated equally. They found that the likelihood of reporting close calls seems dependent not only on the degree of psychological safety felt by the worker in reporting the event, but also whether the close call was caught early (evidence of *resiliency*) or later (evidence of *vulnerability*) in the process.

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"InPen/blue/Lilly" was ordered, along with NovoLOG cartridges. However, when the InPen arrived, pharmacists noticed a label on the product that stated, "For use with Humalog 3 mL U-100 insulin cartridges."

Upon further investigation, it was found that of the six pens available, there are only two different models of the InPen, and each model is available in three colors. One model is used with HumaLOG while the other model is for NovoLOG or Fiasp. The models are not interchangeable due to the size differences between the respective insulin cartridges. The choice in colors appears to be for patient-preference and does not indicate which type of insulin is being used. Upon discovery of the error, the correct InPen device was ordered and replaced prior to dispensing the pen and insulin cartridges to the patient. It was noted by the reporter that the wholesaler's information online regarding the InPen device was confusing and contributed to the ordering error. It is not clear why three different color pens are needed for each model. This type of error would be less likely to occur if each model was one unique color.

Mitigation strategies include educating pharmacy staff on the availability and details of these new products, packaging differences between NovoLOG and Fiasp cartridges and HumaLOG cartridges; adding warnings in the computer system to alert pharmacy staff to verify that the InPen device selected is compatible with the patient's insulin cartridges; and clearly naming each InPen in the computer system with the name of the insulin with which it is compatible. At the pharmacy counter, show the InPen and insulin cartridges to the patient and have both the patient and pharmacy staff person independently verify that the device and cartridge are compatible. For more information on dispensing InPen devices and their specific national drug codes (NDCs) and compatibilities, visit: www.ismp.org/ext/724.

HIGH-ALERT **Mix-ups between Ketalar and ketorolac.** A fire department emergency medical technician (EMT) and an EMT-paramedic responded to a call about a patient who had suffered an injury due to a fall. The

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While psychological safety is important to feel comfortable reporting a close call, Jung et al. found that the odds of reporting were higher if it was caught later in the process, was discerned as a *vulnerability* or near failure, or was felt to be an event that "nearly happened" rather than "could have happened." The willingness to report the event seemed to be related to a strong outcome bias and how close the event came to harming the patient. On the other hand, the odds of reporting a close call were lower if it was caught earlier in the process, deemed a chance success or a sign of *resilience*, or was felt to be an event that "could have happened" rather than "nearly happened." Healthcare workers were less inclined to report close calls that seemed to be distant to patient harm or have a weak or neutral outcome bias.

Prior research suggests that the perceived severity of a close call may reduce psychological safety and thus reduce the willingness to report the event. However, these recent findings suggest that another variable that predicts the likelihood of reporting close calls is whether the event is perceived as a failure or *vulnerability* rather than a success or a sign of *resilience*. Jung et al. point out that close calls that are identified early in the process may resemble an ordinary, everyday occurrence, more so than a reportable incident. These early mistakes may not be regarded as sufficiently important to report.

The authors suggest that educating healthcare workers about the dual nature of close calls, which can demonstrate either *vulnerability* or *resilience*, may aid appropriate recognition of all close calls as learning opportunities. Healthcare workers should be encouraged to report all types of close calls, including seemingly minor ones that occur early in the process. There is much that can be learned about both the *vulnerability* and *resilience* of your systems from all close calls.

Reference

1) Jung OS, Kundu P, Edmondson AC, et al. Resilience vs. vulnerability: psychological safety and reporting of near misses with varying proximity to harm in radiation oncology. *Jt Comm J Qual Patient Saf.* 2021;47(1):15-22. www.ismp.org/ext/713

Infection transmission risk with shared glucometers, fingerstick devices, and insulin pens

The Centers for Disease Control and Prevention (CDC) has issued several warnings regarding unsafe practices that might result in the transmission of hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), and other infectious diseases during assisted blood glucose monitoring and insulin administration (www.ismp.org/ext/714). Assisted blood glucose monitoring is when a healthcare worker uses a shared glucometer to assist or perform glucose testing, usually for multiple patients with diabetes (as opposed to self-blood glucose monitoring using the patient's own glucometer). This typically occurs in hospitals or clinics, ambulatory care settings, senior centers, correctional facilities, long-term care settings, health fairs, and schools or camps.

Outbreaks associated with assisted blood glucose monitoring have been identified with increasing regularity in various inpatient and outpatient healthcare settings where blood glucose monitoring equipment is shared. Failure to follow the most basic principles of infection control contributed to most of these outbreaks.

Most frequently, the unsafe practices that have contributed to the transmission of infections include the following:

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patient was in significant pain due to a fracture in her right leg. The EMT-paramedic determined that it was appropriate to administer ketamine for pain management. Per protocol, the dosing for ketamine was 0.25 mg/kg intravenously (IV) with a maximum initial dose of 25 mg (which applied to this patient). However, the EMT gave the patient 25 mg of ketorolac after both the EMT and EMT-paramedic confirmed the vial was in date and the dosing was correct. It appears that they both mixed up ketorolac and KETALAR (ketamine), even though ketorolac was available in their medication stock in 30 mg per 1 mL vials and Ketalar was packaged in 500 mg per 10 mL vials. Thankfully, for this patient, an appropriate dose of ketorolac would have been similar, and the patient did not suffer any adverse effects from the error. The EMT and EMT-paramedic did not realize the mistake until later when they were restocking their truck.

ISMP has received eight separate reports about mix-ups between these drugs. Some cases appear to be a crossover problem between the ketamine brand name, Ketalar, and the nonproprietary name, ketorolac. Both names share the letters K, E, T, A, L, and R (A, L, and R are positioned in a different order). Other events appear to be related to both generic names and the brand name Ketalar beginning with K-E-T. Using the first three letters also may lead to the names appearing on the same computer screen, increasing the risk of a selection error. Since ketamine is a generically available medication, removing the name Ketalar from drug databases might help prevent some mix-ups but not those between the generic names. ISMP believes that at least five letter characters should be entered when searching for and selecting medications in electronic systems. Also, the pharmacy that supplies the emergency medical services (EMS) medications can help avoid drug selection mix-ups by applying auxiliary labels to these products. This name pair already appears on our confused drug name list (www.ismp.org/node/102).

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- Using fingerstick devices, also called lancing devices, for more than one person
- Using a blood glucometer for more than one person without cleaning and disinfecting it after every use
- Failing to change gloves and perform hand hygiene between fingerstick procedures
- Using insulin pens for more than one person risks infection transmission

Fingerstick devices should **never** be used for more than one person. Although some fingerstick devices have been previously approved and marketed for multi-patient use and require the lancet and disposable components to be changed between each patient, CDC recommends **never** using these devices for more than one person due to failures to change the disposable components, difficulties with cleaning and disinfection after use, and their link to multiple HBV infection outbreaks. Single-use fingerstick devices are disposable and prevent reuse through an auto-disabling feature.

Whenever possible, blood glucometers should **not** be shared. If they must be shared, each device should be cleaned and disinfected after every use, per the manufacturer's instructions. The glucometer must be cleaned before it can be disinfected, which might require the repeated application of an approved cleaning agent following the manufacturer's recommendations. If the manufacturer does not specify how the device should be cleaned and disinfected, then the glucometer should not be shared. Organizations have the responsibility to verify with the manufacturer that the glucometers are, in fact, approved to be used for multiple patients.

Using insulin pens for more than one patient is an ongoing medication safety risk we have previously discussed in this newsletter and during consultations and live presentations, starting as early as 2008. Since then, ISMP and others have chronicled large-scale, potential exposures to bloodborne pathogens caused by using insulin pens for multiple patients even after changing the needle. Insulin pens should **never** be used for more than one patient.

Additionally, The Joint Commission (TJC) has found that knowledge gaps among providers and leaders associated with assisted glucose monitoring and insulin administration via a pen have resulted in unsafe practices and subsequent escalation to an *Immediate Threat to Health or Safety*. TJC has just released an informational video that examines some of the more common mistakes witnessed by surveyors when staff administer insulin via a pen or perform glucose monitoring using a shared glucometer (www.ismp.org/ext/715). Additionally, the May 2021 issue of *Perspectives* details helpful information on compliance with standards related to glucose monitoring and insulin administration (The Joint Commission. Consistent Interpretation. Joint Commission surveyor's observations of staff competency related to blood glucose monitoring and insulin administration. *Perspectives*. 2021;41[5]:38-41).

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Confirm correct mg and mL dose based on product concentration supplied.

A discharge prescription for testosterone cypionate 100 mg/mL in oil for intramuscular (IM) injection included directions to administer 0.5 mL (50 mg) into the muscle every week. However, in the outpatient pharmacy, testosterone cypionate in oil was only available in a 200 mg/mL strength from the pharmacy wholesaler. A pharmacy technician selected the only strength listed in the computer and prepared a 200 mg/mL vial for dispensing. However, the technician mistakenly used the original prescription directions to "inject 0.5 mL" into the muscle every week. A pharmacist verifying the medication did not catch the error. The directions should have been changed to inject 0.25 mL for a 50 mg dose.

As a result of this error, pharmacy technicians at this pharmacy now document not only the mL amount but also the mg amount so the pharmacist can confirm the dose in mg and mL when conducting the final product verification. The prescriber will be called if a prescribed concentration does not match the available product concentration.

Special Announcements

Accepting CHEERS AWARDS nominations

Nominations for this year's **ISMP CHEERS AWARDS** will be accepted through **September 10, 2021**. The prestigious AWARDS celebrate the efforts of individuals, organizations, and groups that have demonstrated an exemplary commitment to medication safety. ISMP accepts external nominations, including self-nominations. To submit a nomination, visit: www.ismp.org/node/1036.

FREE ISMP webinar

Join us on **July 20, 2021**, for a **FREE** webinar on ***The Inside Track on Drug Naming Safety Standards***. Hear first-hand from our panel of experts about the problems that created a need to improve drug naming safety, the steps in the development of a drug name, and the benefits of drug name testing. For more information and to register, visit: www.ismp.org/node/25216.

A New Risk Evaluation Tool

ISMP Medication Safety Self Assessment®

for Perioperative Settings

If you have any questions while conducting the assessment, refer to the **Frequently Asked Questions** (www.ismp.org/node/18027) or **contact ISMP** at: selfassess@ismp.org

View a **free recorded webinar** to help you obtain the most accurate and useful results: www.ismp.org/node/23830

Take part in the ***ISMP Medication Safety Self Assessment® for Perioperative Settings***

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- Follow the instructions for completing the assessment
- Access the online assessment and create a login
- Submit your findings by: **August 31, 2021**
- www.ismp.org/node/18027

Participate in a **unique opportunity** for **collaborative groups** to pool members' assessment results! Collaborative codes can be added to your login account **after** submitting your findings to ISMP. For information, contact: selfassess@ismp.org.

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