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ISMP An ECRI Affiliate

Nurse AdviseERR®

Educating the Healthcare Community About Safe Medication Practices

Explore our updated ConsumerMedSafety.org website

We are delighted to announce we officially launched our newly updated consumer website in August 2022, ***ConsumerMedSafety.org***. In 2009, we initially launched *ConsumerMedSafety.org* as the only website designed by a nonprofit organization exclusively to bring the message of medication error prevention directly to the consumer. Our updated website (**Figure 1**) demonstrates our commitment to providing the most up-to-date information about medication safety to consumers in a way that is easy to navigate.

Figure 1. *ConsumerMedSafety.org* has a fresh look, and consumers can access the site via the internet on any computer, tablet, or smartphone.

ConsumerMedSafety.org has a newly branded logo (**Figure 1**). The updated website has a modern and clean look, and it remains advertisement free. Consumers can easily access, view, and use the website, which includes the following key features:

Scrolling marquee. The first feature that consumers will notice on the website is a scrolling marquee. The scrolling marquee provides vital and newly posted content, including the latest medication safety warnings and advice from experts. Current examples include a feature on how to avoid confusing "concentrated ibuprofen infant drops" with "children's ibuprofen," and a warning for consumers to use caution when taking medications that are packaged with desiccants.

Search feature. Consumers can use the search feature, located directly above the scrolling marquee, to find medication safety articles by entering a keyword. A robust search engine drives the search function to help consumers easily locate safety topics of interest. Consumers can also click the "browse all safety articles" button to scroll through hundreds of medication safety topics and breaking news about medication safety-related issues. Current examples include preventing mistakes with your pet's medications, tips for starting and stopping antidepressants safely, and clues that a pharmacist has forgotten to reconstitute a powdered medication.

Error-reporting feature. We invite consumers to share their stories about errors or other medication safety issues by clicking on the red button that says, **Report a Medication Error**. This button is prominently located above the scrolling marquee, and **Reporting Medication Errors** is also in the toolbar at the top of the webpage. Clicking the red button or top-screen navigation tool takes consumers to a

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Your *Reports* at *Work*

Elimination of orange-capped TB syringes.

We published a ***SAFETY* wire** in our March 2022 newsletter (www.ismp.org/node/30409), encouraging pharmacy staff to work with their wholesalers to avoid purchasing orange-capped Monoject 1 mL tuberculin (TB) syringes with a $^{5}/_{8}$ inch 25-gauge needle from Cardinal Health. The orange-capped TB syringes look very similar to orange-capped insulin syringes with permanently attached needles (**Figure 1**) and immediately caused confusion when distributed to patient care areas. ECRI, our affiliate and safety partner, also recently published an *ECRI Hazard Report* about this topic, which can be found by clicking here: www.ismp.org/ext/987.

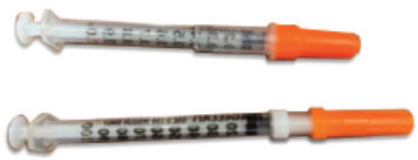

Figure 1. Orange-capped Cardinal Health tuberculin syringes (top) look similar to U-100 insulin syringes (bottom).

Since learning about your reports on this issue, Cardinal Health has told us that the company plans to change the color of its orange-capped TB syringes back to the original red/brown cap color. This will help distinguish the tuberculin syringe from similar-looking orange-capped insulin syringes. This will also help avoid potential tenfold insulin overdoses that have occurred due to confusion between unit and mL markings.

Until Cardinal Health resolves this issue, and the red/brown-capped tuberculin syringes become available again, continue to purchase TB syringes without orange caps. Also, confirm that the syringe selected for insulin preparation has unit markings and not mL markings.

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webpage that describes the importance of reporting medication errors and walks them through a user-friendly online reporting form. Or, consumers can always submit a report by calling ISMP directly at 215-947-7797. When consumers report errors to ISMP, it allows us to identify ways to improve medication safety. Staff at ISMP review all error reports and inform the US Food and Drug Administration (FDA) of the error. Additionally, ISMP notifies drug companies when the medication labeling or packaging requires changes. However, we keep all information about the consumer and the location where the event occurred confidential. We may then share some errors as anonymous stories in our newsletters, on our *ConsumerMedSafety.org* website, and/or on our professional website (www.ismp.org). These error examples often contain recommendations to prevent medication errors for consumers, healthcare providers, regulators, standards organizations, and drug companies.

Medication Safety Tips. In the toolbar at the top of the website, the first navigation drop-down menu, **Medication Safety Tips**, includes three sections: *Safety with Medicines*, *Safety by Location*, and *Safety by Population*. Each section features articles and/or tools that are specific for certain topics or situations. For example, under the Safety with Medicines section, consumers will find teaching brochures on various high-alert medications, as well as safety information on over-the-counter (OTC) medications, vaccines, medication patches, and eye and ear drops. The *Safety by Location* section provides safety tips that are useful while consumers are at home or at the hospital, doctor's office, pharmacy, school, or on the go (traveling). Finally, the *Safety by Population* provides safety tips for various age groups, such as older adults, infants and children, and even has information about medication safety with pets.

Featured Resources. In the toolbar at the top of the website, the next navigation button, **Featured Resources** has a drop-down menu that lists six sections:

- The **Insulin Safety Center** provides tips for preventing mistakes with insulin, a high-alert medication frequently involved in harmful errors. This section offers consumers basic information about insulin, the typical errors that happen when using insulin, and the steps to prevent these errors. For example, this section provides detailed safety tips for using an insulin pen correctly.

- The **Over-The-Counter (OTC) Medicines** section is where consumers can navigate through 10 different topics related to medications that can be purchased without a prescription. In this section, consumers can find important safety tips about OTC medications, including medication storage and disposal; drug interactions, reactions, and allergies; multi-symptom and combination products; medications for children; measuring the dose of liquid medications; herbals, vitamins, and homeopathic products; OTC pain relievers; and OTC drug abuse.

- The section called **Top 10 Tips Lists** features various medication safety lists. For example, one list describes the *Top 10 Steps Parents Should Take to Prevent Medicine Mishaps* when giving a child medicine. Other examples include the *Top 10 Reasons to Suspect a Pharmacy Error*, the *Top 10 Ways to Prevent Drug Name Mix-ups*; the top 10 safety tips when using medicines that are applied to the skin, when traveling with medicines, and when measuring liquid medicine doses; the *Top 10 Over-The-Counter Medicines Abused by Teens;* and much more.

- **FDA Alerts** is a special section dedicated to delivering the latest updates on medications and products regulated by FDA, such as "Do not make or feed homemade infant formula to babies." This section also provides links to information on recent drug recalls, drug shortages, and Medication Guides.

- The **Additional Resources** section features specific topics related to general safety with medications. Here consumers can find information about how to read a prescription, keeping track of home medications, preparing for a disaster, measuring liquid medications, medications not to crush or chew, and much more.

- The **General Medication Safety** section provides general advice, such as what consumers can do to prevent medication errors at home, while in the hospital, and while at an appointment with your doctor.

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what's in a Name?

The -fungin drug stem name

Medications with the suffix "-fungin" belong to a class of antifungal medications known as echinocandins. Echinocandins work to weaken the fungal cell wall by inhibiting the synthesis of beta-(1,3)-D-glucan, an enzyme needed to create and maintain the integrity of the cell wall of the fungus. This class of antifungal medications has fungistatic (prohibit growth) activity against most species of *Aspergillus*. In addition, they have fungicidal (kill the fungus) activity against some species of *Candida*, particularly those that are resistant to fluconazole (another antifungal agent, in another drug class). Echinocandins are primarily used to treat esophageal candidiasis, candidemia, and invasive candidiasis. In addition, they are used as empiric treatment of febrile neutropenia and salvage therapy for the treatment of invasive aspergillosis.

There are three echinocandins (**Table 1**) approved for use in the United States by the US Food and Drug Administration (FDA). These drugs are poorly absorbed by the gastrointestinal (GI) tract and cannot be taken orally, and therefore, they must be given intravenously (IV). In addition, they do not cross the blood-brain barrier or penetrate the eye, so they are ineffective in treating fungal meningitis and intraocular inflammation.

Echinocandins are very well tolerated and have minimal side effects. The most common adverse effects reported include rash, fever, nausea, and inflammation of a vein at the infusion site. Additionally, if the medication is infused too rapidly, the patient may experience a histamine-like reaction such as facial flushing. Treatment with antihistamines and reducing the infusion rate for future doses can help reduce this reaction. Finally, these medications are embryotoxic so they should not be given to pregnant women.

Table 1. Echinocandins medications available in the United States.

Generic name	Brand name
anidulafungin	**ERAXIS**
caspofungin	**CANCIDAS**
micafungin	**MYCAMINE**

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The website also includes information about ISMP and our mission, and why consumers can trust the information on *ConsumerMedSafety.org*.

Learning about safe medication practices and being involved in care decisions is an excellent way for consumers to help prevent a medication error from happening. We hope hospitals and health systems will share *ConsumerMedSafety.org* with their staff and patients, and help distribute this valuable medication safety information. If your organization would like to link to *ConsumerMedSafety.org* on your website, please go ahead and do so! Placement on the patient-facing portal section of your site is an ideal location for this information. Also, please consider making a charitable donation to ISMP (www.ismp.org/support/donate). With your help, we will be able to continue our work to keep consumers safe and to lead efforts to improve the medication-use process.

Trend shows increased nursing workload to address smart pump alerts for HYDROmorphone and fentaNYL infusions

Problem: After reviewing 2019-2021 smart infusion pump data from 20 health systems, Bainbridge Health identified a dramatic increase in the smart infusion pump alerts associated with both fenta**NYL** and **HYDRO**morphone infusions due to higher dosing requirements for patients during the coronavirus disease 2019 (COVID-19) pandemic. Palliative care infusions, when able to be identified (e.g., by care area), were excluded from the analysis. Because the increase in utilization and doses for these opioids has resulted in a significant number of infusion pump alerts, an analysis of the data is provided below to increase your awareness of the issue, prompt the review of your smart pump data for similar trends, and ensure your smart infusion pump alerts align with clinical practice to avoid alert fatigue.

Increase in Utilization

Fenta**NYL** is an essential medication for analgesia and sedation in critically ill patients,[1] as it acts quickly, has no active metabolites, and does not trigger the release of histamine. But during intermittent fenta**NYL** shortages, shifts in prescribed therapy may have resulted in an increase in **HYDRO**morphone infusions to sedate ventilator-dependent patients, especially during the COVID-19 pandemic. The data show a dramatic increase in **HYDRO**morphone infusions, from 2,024 in 2019, peaking to more than 20,000 in 2020, and remaining elevated at eight times higher than the baseline at 16,309 in 2021 (**Figure 1**). Despite fluctuations in fenta**NYL** availability, there was also a substantial increase in the use of fenta**NYL** infusions, which more than doubled between 2019 and 2021.

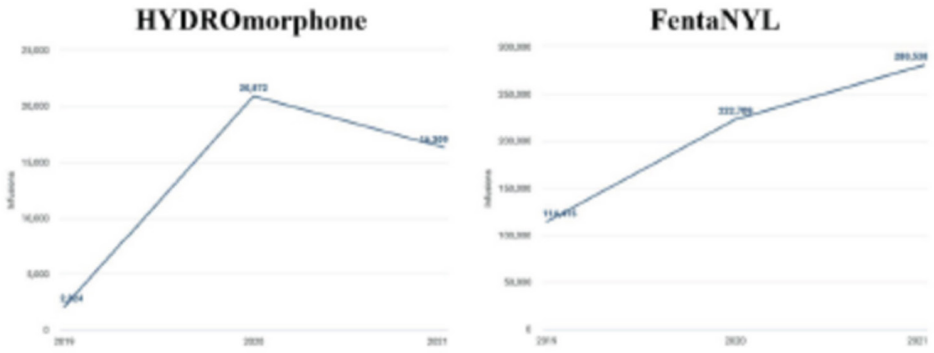

Figure 1. The frequency of both **HYDRO**morphone and fenta**NYL** infusions increased between 2019 and 2021

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SAFETY wires

Scan before you flush. Due to drug shortages, organizations have sometimes been purchasing products in short supply from different, unfamiliar manufacturers. One organization reported purchasing 0.9% sodium chloride (10 mL in a 12 mL syringe) and heparin flush in 0.9% sodium chloride solution (500 units/5 mL in a 12 mL syringe) from Medefil that looked nearly identical. The heparin flush syringes have yellow syringe caps and labels while the sodium chloride flush syringes have peach (which may appear yellow to practitioners) syringe caps and labels. Also, both state "0.9% sodium chloride" in similar positions, and they are both packaged in 12 mL syringes (**Figure 1**). One organization told us that the heparin flush syringes were accidentally placed in a bin intended for saline syringes. Fortunately, this mix-up was caught prior to administration by a visual check and barcode scanning.

Other organizations reported concerns due to the similarity between the Medefil heparin flush syringe (500 units/5 mL) and the 10% calcium chloride (1,000 mg/10 mL) syringe, also packaged in a 12 mL syringe by Medefil (**Figure 2,** page 4). Out of the overwrap, these syringes are hard to tell apart visually and are likely to be confused with one another. In these cases, practitioners were able to purchase the calcium chloride syringes from a different manufacturer due to concerns with stocking these syringes in code carts.

Figure 1. Heparin 500 units/5 mL (top) and 0.9% sodium chloride (bottom) flush syringes by Medefil look similar. Both use shades of yellow (or peach) for the syringe labels and caps, and are in 12 mL syringes.

To detect wrong product selection, require practitioners to scan all flushes prior to dispensing, when refilling stock, and prior to administration. We also recommend a proactive review of the packaging and labeling of products when purchased, especially during drug shortages when products could be changing rapidly. If look-alike products must be purchased,

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Increase in Doses

In addition to an increase in use, doses for **HYDRO**morphone and fenta**NYL** infusions have trended higher for both the mean and maximum (**Figures 2** and **3,** page 4) programmed doses in the same timeframe. For example, the average maximum dose for **HYDRO**morphone infusions rose from 2.7 mg/hour to 3.9 mg/hour, and for fenta**NYL** infusions, the average maximum dose rose from 146 mcg/hour in 2019 to 165 mcg/hour in 2021 during the 3-year period. These findings are not surprising given that the literature suggests ventilator-dependent COVID-19 patients might require higher doses of sedation.[2]

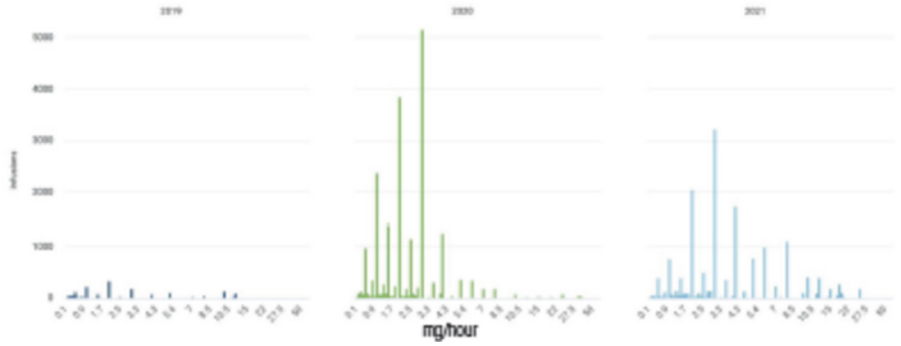

Figure 2. HYDROmorphone maximum infusion dose distribution (mg/hour) between 2019 and 2021

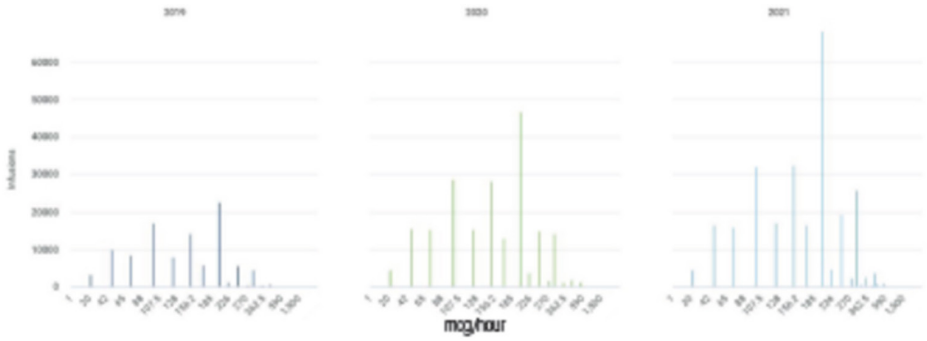

Figure 3. Fenta**NYL** maximum infusion dose distribution (mcg/hour) between 2019 and 2021

Increase in Smart Pump Alerts

HYDROmorphone and fenta**NYL** contribute to a significant number of smart infusion pump alerts. Together, they accounted for 5.4% of the alerts for all continuous infusions programmed into smart infusion pumps in 2019, but the alerts rose to more than 16% in 2021 (**Table 1**). While the percentage of alerts for these medications increased and stayed higher than baseline during the 3-year review period, alerts for **HYDRO**morphone showed a dramatic spike from 2019 to 2020, followed by a decrease in alerts during 2021. This may be explained by an intentional focus on reducing clinically insignificant **HYDRO**morphone alerts during 2020 in the health systems providing data. Fenta**NYL** alerts continued to rise during the 3-year period.

Table 1. Percent of smart infusion pump alerts from **HYDRO**morphone and fenta**NYL**

Year	Continuous Infusion Alerts		All Alerts (including bolus dose alerts)	
	% from HYDROmorphone	% from fentaNYL	% from HYDROmorphone	% from fentaNYL
2019	1.1%	4.3%	2.5%	1.7%
2020	8.4%	10%	5.7%	4.7%
2021	4.4%	12.3%	4%	6.1%

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implement strategies (e.g., auxiliary labels, circling important information) to call out their differences. Make practitioners aware of new products that pose look-alike issues, and emphasize the importance of barcode scanning, including flush syringes. FDA and Medefil have been notified of these concerns, and Medefil told us they are in the process of changing the syringe colors.

Figure 2. Heparin flush 500 units/5 mL (top) and 10% calcium chloride (1,000 mg/10 mL) syringes by Medefil look similar, as both have yellow labeling.

Pharmacy and nursing staff should also be involved with other hospital groups like central supply, purchasing, or value analysis teams to help identify these issues proactively. Flush syringes are not considered "medications" and may be purchased and distributed outside of the pharmacy, making it more difficult to identify these look-alike issues.

Confirm tenecteplase indication and dose before use. TNKASE (tenecteplase), a Genentech product, is an intravenous (IV) thrombolytic agent approved for ST-elevation myocardial infarction (STEMI). This indication is displayed on the top panel of the carton (**Figure 1,** on page 5), and the dosing regimen for this indication is printed on the inside flap of the panel. Many hospitals are now considering or are already using tenecteplase off-label for acute ischemic stroke, as it may have more favorable clinical outcomes and a simplified administration process compared to alteplase (www.ismp.org/ext/952). However, the dose for acute ischemic stroke (0.25 mg/kg, maximum dose of 25 mg) is very different than the tiered dosing for STEMI, which is based on a weight range (maximum dose of 50 mg). For acute ischemic stroke, patients could receive a twofold overdose if practitioners follow the dosing instructions for the only approved indication, STEMI, as prominently displayed on the carton.

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SAFE PRACTICE RECOMMENDATIONS: Has your organization experienced similar increases in **HYDRO**morphone and fenta**NYL** infusion use/dosing and associated smart pump alerts as a result of clinical practice changes associated with treating patients with COVID-19? We suggest that you review your smart pump data and evaluate the trends in **HYDRO**morphone and fenta**NYL** infusion utilization, dosing, and alerts. A comprehensive medication-use evaluation (MUE) for each medication infusion may be needed to better understand the impact. Share and discuss the pump data analysis and MUE results with your medication safety committee to determine whether modifications to protocols, order sets, and smart pump libraries are warranted.

Maximum dose limit alerts from smart infusion pumps that do not align with current clinical practices are likely to lead to alert fatigue, overridden alerts, and potential patient harm. However, before increasing the maximum dose limit thresholds for fenta**NYL** and **HYDRO**morphone infusions, review the literature and your data to ensure your clinical decision support parameters are safe. For example, increasing the dose limit for fenta**NYL** infusions to 500 mcg/hour may lead to tenfold dosing errors for patients who should receive 50 mcg/hour. Also, if your organization does not have a separate care profile in the drug library for palliative care and/or end-of-life care, consider adding one to avoid nuisance alerts while sustaining safe limits for all patient populations.

ISMP thanks Sean O'Neill, PharmD, and Joanne Hatfield, PharmD, BCPS, at Bainbridge Health or providing data for this article (www.bainbridgehealth.com).

References

1) Devlin JW, Skrobik Y, Gélinas C, et al. Clinical practice guidelines for the prevention and management of pain, agitation/sedation, delirium, immobility, and sleep disruption in adult patients in the ICU. *Crit Care Med*. 2018;46(9):e825-73.
2) Hanidziar D, Bittner EA. Sedation of mechanically ventilated COVID-19 patients: challenges and special considerations. *Anesth Analg*. 2020;131(1):e40-1.

Please take our survey on tall man letters!

ISMP is updating our list of ***Look-Alike Drug Names with Recommended Tall Man Letters*** (www.ismp.org/node/136). We are asking for your input by taking a short survey. Please submit your responses by **December 2, 2022**, online at: www.ismp.org/ext/1014. Our list of drug name pairs with tall man letters was first compiled in 2008 to help healthcare organizations employ a standard set of tall man letters to differentiate look-alike drug names. We are considering adding a few name pairs that have been involved in errors, and we truly value your opinion! Meanwhile, ISMP is participating in a 4-year Northwestern University (Chicago) research project, led by Bruce L. Lambert, PhD, and funded by the US Food and Drug Administration (FDA), to assess the comparative effectiveness of various methods of drug name text enhancements and the ability of tall man (mixed case) lettering to reduce errors during drug selection.

>SAFETYwires

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Using tenecteplase for both STEMI and acute ischemic stroke may also allow some facilities to avoid routine use of **ACTIVASE** (alteplase), another tissue plasminogen activator. This could help steer clear of well-documented mix-ups due to the use of abbreviations, "TNK" for tenecteplase or TNKase, and "t-PA" or "TPA" for alteplase. Practitioners involved in these mix-ups assumed that t-PA was shorthand for TNKase and attributed the error to confusion between TNK and TPA.

Determine if your organization can carry only one tissue plasminogen activator on formulary. If your hospital is considering the use of tenecteplase for ischemic stroke, risk-reduction strategies may include removing the vial from the carton and storing the medication in a stroke kit or creating a stroke dosing card that is affixed to each carton. Review how the medication is ordered in the electronic health record (EHR) and use order sets to guide the correct dose based on the indication. To avoid confusion, especially when transitioning from alteplase to tenecteplase, remove abbreviations from all order sets, order entry screens, automated dispensing cabinets, smart infusion devices, and treatment protocols. Educate practitioners to never use abbreviations for drug names; the full drug name should always be used. When possible and timely, have the pharmacy prepare and dispense each dose. As more hospitals use tenecteplase off-label for stroke, it makes sense for Genentech to consider removing the STEMI dosing table from the inside flap of the carton. However, unless the indication for use in acute ischemic stroke is approved, this will not occur.

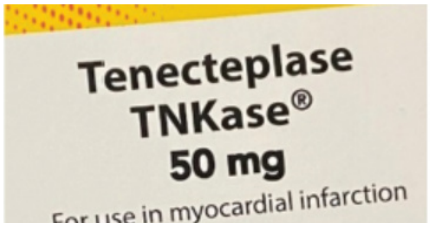

Figure 1. The top of the TNKase (tenecteplase) carton specifies use in STEMI. Currently, this is the only labeled indication; however, off-label use for acute ischemic stroke is increasing, and the dosing is different.

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