

# Top Medication Errors Reported to ISMP in 2019

## Top Medication Errors Reported to ISMP in 2019

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## Objectives

- Share globally relevant medication errors reported to ISMP between October 2018 to September 2019
- Discuss strategies that can be employed to help reduce medication errors

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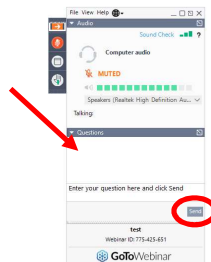
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## To ask a question:

1. Type your question into the "Questions" box and click send.
  - a) We will verbally answer your questions.



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# Top Medication Errors Reported to ISMP in 2019

## Abbreviating “tPA” and “TXA” leads to confusion between alteplase and tranexamic acid



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## Problem

- Practitioners still utilize the error-prone abbreviations “tPA” and “TXA” for alteplase and tranexamic acid
- A nurse mentally confused the abbreviations and removed tranexamic acid instead of alteplase from an automated dispensing cabinet
- A prescriber mentally mixed up the abbreviations and prescribed tranexamic acid instead of alteplase for a stroke patient

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## Recommendations

- Avoid abbreviations for drug names, including “tPA” and “TXA”
- Refer to medications by their generic or brand names only and include an indication with medication orders to further avoid confusion
- Alert practitioners to the risk of mental mix-ups between look- and sound-alike error-prone drug name abbreviations, such as “tPA,” “TXA,” “TNK,” and “TPN”

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# Top Medication Errors Reported to ISMP in 2019

## Inadvertent administration of tranexamic acid intraspinal instead of bupivacaine or ropivacaine



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## Problem

- Two cases of inadvertent intraspinal injection of tranexamic acid were reported, and a recent review article identified 21 additional cases
- The mortality rate is 50% and otherwise results in paralysis, including paraplegia
- In the US, all three products are available in vials with blue caps that are often stored upright making the labels difficult to read
- These medicines are typically used in areas where barcode scanning is not utilized (e.g. operating room, labor and delivery)

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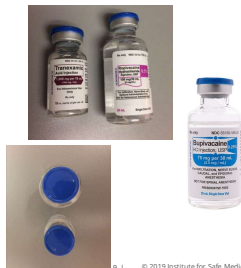
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## Problem

- In this example the label colors and vial sizes are different
- However, the caps of ropivacaine and tranexamic acid vials are both blue
- The same company's bupivacaine vial also had a blue cap
- There is also a great danger if the anesthetic is accidentally given intravenously instead of tranexamic acid



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## Recommendations

- Purchase these products from various manufacturers to help differentiate vial appearance
- Consider purchasing premixed tranexamic acid bags
- Avoid upright storage to ensure labels are always visible
- Store tranexamic acid vials separately and adding an auxiliary label to tranexamic containers to note the IV route of administration
- As much as possible, employ barcode scanning prior to dispensing or administering these products

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## Mix-ups between epidural bupivacaine and intravenous antibiotics in labor and delivery units



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## Problem

- Mix-ups in labor and delivery units between epidural bupivacaine and intravenous (IV) antibiotics continue
- The latest events include IV administration of epidural fentaNYL with bupivacaine and epidural administration of IV gentamicin
- Contributing factors included look-alike infusion bags, overlooked warning labels, not using a barcode medication administration system, and drug shortages
- In the above errors, both mothers and babies are without long-term sequelae, but prior IV administration of epidural bupivacaine has resulted in fatalities

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# Top Medication Errors Reported to ISMP in 2019

## Recommendations

- Educate practitioners about the risk of mix-ups due to look-alike bags
- During medication shortages, warn practitioners about changes in product appearance, labeling, container sizes, and concentrations
- Use colored overwraps or a different size and/or shape container for epidural analgesia with epidural-specific tubing
- The practitioner administering the epidural analgesia should bring fentanyl to the bedside immediately before use
- Encourage use of a barcode medication administration system

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## Designing effective warnings



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## Problem

- Warnings are generally less reliable than design strategies that eliminate hazards altogether, prevent hazards from touching targets, or detect errors before they reach patients
- But warnings can reduce the risk of errors when they are well designed
- If warnings do not reach the target audience, capture attention, and cause the recipient to understand the warning and the required response, they will not be effective

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## Recommendations

- Print visual warnings in big, bold font using mixed case letters (not all uppercase)
- Make sure the warning is clinically important
- Use correct signal words (*caution* or *warning* for injuries that *might* occur, *danger* for serious hazards that are *more likely to occur*) and color to draw attention to the warnings
- Use affirmative wording when possible (e.g. avoid “Not for IV use;” state “For oral use only”), and embed pictures

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## Safety enhancements every hospital must consider after another tragic neuromuscular blocker event



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## Problem

- National news in the US exposed the details of a fatal medication error in which a neuromuscular blocker was inadvertently administered to an unventilated patient.
- Intending to administer intravenous VERSED (midazolam) to a patient in radiology with claustrophobia, a nurse mistakenly selected vecuronium from an automated dispensing cabinet screen using the override function after typing the first two letters of the drug name, “VE,” for Versed. The patient was not monitored and was found in full arrest 30 minutes later. She died the next day.

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# Top Medication Errors Reported to ISMP in 2019

## Recommendations

- Assign minimum number of letter characters to select high-alert medications to minimize errors with other medications that start with the same beginning letter characters
- Consider a well-placed independent double check for select high-alert medications
- Establish a standard process for administering and monitoring patients who require sedation in radiology

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## Recommendations

- ISMP has asked automated dispensing cabinet manufacturers make software changes (e.g., drug name searches requiring at least 5 letters) and manufacturers to clarify the warning message on vials
- ISMP recommends practitioners routinely review automated dispensing cabinet policies and procedures

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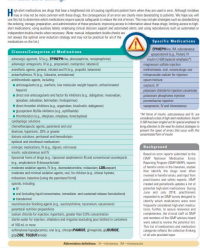
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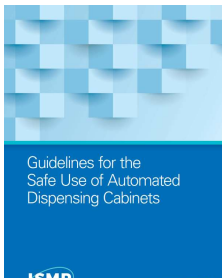
### ISMP List of High-Alert Medications in Adult Care Settings



The table lists high-alert medications categorized by drug class. It includes columns for drug name, concentration, and other relevant information. The list is organized into sections for different drug classes, such as anticoagulants, sedatives, and insulin.

| Drug Class     | Drug Name                          | Concentration          |
|----------------|------------------------------------|------------------------|
| Anticoagulants | Heparin                            | 10,000 units/mL        |
|                | Warfarin                           | 1 mg/mL                |
|                | Direct Oral Anticoagulants (DOACs) | Various concentrations |
|                | Insulin                            | Various concentrations |
| Sedatives      | Propofol                           | 10 mg/mL               |
|                | Midazolam                          | 2 mg/mL                |
|                | Fentanyl                           | 0.1 mg/mL              |
|                | Sufentanil                         | 0.5 mcg/mL             |
| Chemotherapy   | Cyclophosphamide                   | Various concentrations |
|                | Etoposide                          | 10 mg/mL               |
|                | Fluorouracil                       | 500 mg/mL              |
|                | Paclitaxel                         | 3 mg/mL                |

<https://www.ismp.org/sites/default/files/attachments/2018-10/highalert2018new-Oct2018-v1.pdf>



[https://www.ismp.org/system/files/resources/2019-11/ISMP170-ADC%20Guideline-020719\\_final.pdf](https://www.ismp.org/system/files/resources/2019-11/ISMP170-ADC%20Guideline-020719_final.pdf)

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# Top Medication Errors Reported to ISMP in 2019

## Finalized guidelines for electronic communication of medication information



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## Problem

- Electronic forms of communication are now widely used in healthcare.
- If the conventions used to communicate medication information electronically are not carefully considered, these technologies may contribute to medication errors rather than mitigate risks.

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## Recommendations

- Healthcare organizations and vendors of electronic health information technology should apply the principles in ISMP's updated *Guidelines for Safe Electronic Communication of Medication Information* ([www.ismp.org/node/1322](http://www.ismp.org/node/1322)) when information about medications.

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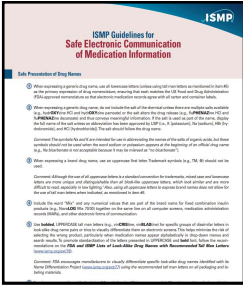
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ISMP Guidelines for Safe Electronic Communication of Medication Information

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Sound-alike error during telephone conversation with poison center

ISMP ADVANCING MEDICATION SAFETY 25

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## Problem

- Patient with insecticide poisoning presented to the emergency department (ED)
- Patient appeared to be suffering from organophosphate poisoning
- ED physician contacted poison control center (PCC), which recommended intravenous pralidoxime 30 mg/kg loading dose followed by an 8 mg/kg/hour infusion for 6 hours
- ED physician heard “pyridoxine” and repeated “pyridoxine” back to PCC

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## Problem

- PCC staff member did not hear that the physician was saying the incorrect medication name
- Pyridoxine (vitamin B6), ordered by ED physician
- Verifying pharmacist reviewed the prescribing information for pyridoxine in a drug database and felt comfortable approving the order since it was within the dose range ordered
- Pyridoxine is listed among other antidotes and is used for isoniazid overdose toxicity

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## Problem

- Pharmacist had enough pyridoxine vials on hand for the 2,200 mg bolus dose that was calculated for the patient. But he had to borrow more vials from another hospital
- Patient received the bolus dose and a partial infusion of pyridoxine before the error was recognized by an intensive care unit (ICU) physician
- Patient did not experience any side effects and no longer needed treatment with pralidoxime as the symptoms of organophosphate poisoning had already subsided

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## Recommendations

- Use read back for telephone communications involving drug names
- Spell drug names
- Poison control center staff should consider sending a confirmation email or fax of their recommendations immediately back to healthcare providers so that any mistakes related to mishearing or misinterpreting the recommendations could more easily be recognized

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# Top Medication Errors Reported to ISMP in 2019

## Dangerous look-alike products



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## Problem

- ISMP received several complaints about look-alike labeling of vials from same manufacturer, including rocuronium, metoprolol, tranexamic acid, deferoxamine mesylate, dexrazoxane, midazolam, labetalol, vancomycin, and ketorolac
- All have carton and vial labels with the same distinct yellow background
- Mix-ups could lead to patient harm

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## Problem

Carton and vial labels have the same mustard yellow background, and a color band highlighting the **strength** distracts one's eyes away from the **drug name**.



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# Top Medication Errors Reported to ISMP in 2019



Rocuronium and metoprolol vials have similar yellow labels and caps



Tranexamic acid vials have been reported to look like rocuronium vials when the caps are removed

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## Recommendations

- ISMP recommends for look-alike products purchasing one or more products from different manufacturers so appearance is changed
- Affixing auxiliary labels may also help prevent mix-ups
- Barcode scanning should be used prior to drug preparation and administration to detect drug mix-ups

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Unintentional 1,000-fold zinc overdose when transposing mcg and mg dosing units



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# Top Medication Errors Reported to ISMP in 2019

## Problem

- When prescribing parenteral nutrition (PN) for a child, a physician ordered 700 mg instead of 700 mcg of zinc
- The PN template defaulted to mg dosing units, which could not be changed to mcg had the physician noticed the error (should have been 0.7 mg)
- Drug Information vendor alerts didn't include zinc sulfate
- Two pharmacists verified the order but failed to notice the error
- The error was noticed by the outsourcing compounder

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## Recommendations

- Ensure that a warning with a hard stop for critical zinc overdoses (e.g., above 250 mcg/kg) appears in order entry systems
- Default to mcg dosing units for zinc in pediatric PN templates and ensure that this corresponds to the way orders are entered in automated compounders
- Conduct effective order verification processes in the pharmacy
- Validate the competencies of staff who order, transcribe, verify, and compound PN

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## Mix-up between methotrexate and metOLazone



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# Top Medication Errors Reported to ISMP in 2019

## Problem

- A patient died after receiving daily methotrexate for a month instead of met**OL**azone
- A common cause of drug name mix-ups is searching by just the first few letter characters, which presents multiple look-alike drug names on the screen
- In this case, the first three letters are the same (M-E-T), and both are available in 2.5 and 5 mg tablet strengths

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## Recommendations

- Use at least 5 letters (see *ISMP Guidelines for Safe Electronic Communication of Medication Information*) to reduce the number of different drugs that appear on a screen during a search
- Use tall man letters for met**OL**azone
- Employ a hard stop in order entry systems to avoid daily methotrexate orders without an appropriate cancer indication

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[illegible]

<https://www.ismp.org/recommendations/content/used-drug-names-list>

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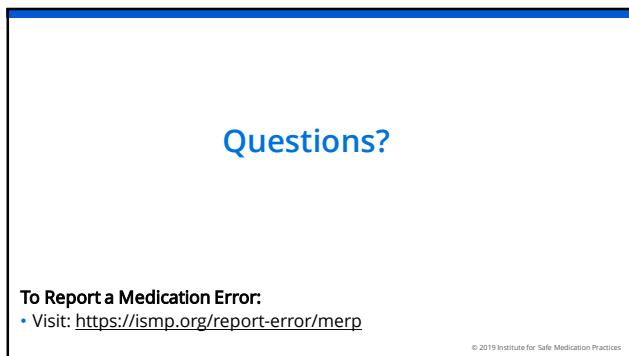
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