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ISMP 25 YEARS ADVANCING MEDICATION SAFETY

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

Highlights from a study of residents' electronic medication prescribing errors

In academic teaching hospitals, medical residents typically enter most of the medication orders for patients using electronic prescribing (e-prescribing) systems. However, little is known about the association between the residents' level of training and the frequency of medication prescribing errors or when they occur. Some studies have revealed the *July effect*, suggesting that errors increase in July as new residents begin their training.[1,2] However, these studies have not specifically analyzed medication errors as the sole adverse outcome. Also, most studies of errors by residents were conducted before widespread adoption of e-prescribing systems and electronic health records (EHRs).[2]

The results of a recent retrospective cohort study by Ari Garber and colleagues on medication e-prescribing errors made by 335 internal medicine residents in an academic medical center were just published in the first 2019 issue of the *Southern Medical Journal*.[2] The large study of more than 1.7 million inpatient electronic medication orders during a 4-year period (2011-2015) is among the first to specifically analyze resident medication e-prescribing errors. The objectives of the study were to describe the types and frequency of resident medication e-prescribing errors and to analyze their association with the post graduate year (PGY) of residency training, and the time of day and month that the errors occurred. The study did not identify all types of medication prescribing errors and instead focused only on problems detected by pharmacists that were classified into 5 categories: prescribing a drug that the EHR identified as an allergy; a drug interaction; duplicate therapy; an unclear or incomplete order that needed clarification; and a failure to adjust doses and/or monitor patients with renal impairment. The research team hypothesized that resident medication e-prescribing errors would decrease as they gained experience and would be highest at night, when the residents had less supervision.[2]

Highlights of the study are provided below;[2] however, we recommend that academic teaching hospitals with medical residents read the full results, discussion, and conclusions of this study (www.ismp.org/ext/153) to gain further insight into resident medication e-prescribing errors and to assist in planning effective strategies to reduce the risk of their occurrence.

Study Results[2]

Frequency and Harm

- Despite some error detection functionality (e.g., duplicate therapy and allergy alerts) with the e-prescribing system, pharmacists identified an error in approximately 4% of the residents' medication orders.
- None of the resident medication e-prescribing errors detected in this study resulted in patient harm because pharmacists identified and corrected them before reaching patients.

Types

- Overall, and for each PGY level (1, 2, 3), the most common type of error was a failure to adjust dosing or monitor for renal impairment (40%), followed by unclear or incomplete orders that needed clarification (27%), duplicate therapy (25%), drug interaction (5%), and prescribing a drug to which a patient may be allergic (4%).

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SAFETY brief

For medication orders, "fuzzy matching" is fuzzy illogical. The 2018 Epic upgrade released last year has incorporated "fuzzy matching" (also referred to as "fuzzy logic") into its new platform. Simply put, if you misspell a word (e.g., medications, other treatments such as lab tests) when entering orders, or a patient's name when searching, fuzzy matching in Epic presents a list of what the system "thinks" you are searching for, which may not be an exact match. You must then select the correct

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Become an ISMP Fellow

ISMP is accepting applications until **March 31** for three unique Fellowship programs commencing in the summer/fall of 2019:

The **ISMP Safe Medication Management Fellowship** offers a pharmacist, nurse, or physician an opportunity to spend 1 year learning from the nation's experts in medication safety at the Horsham, PA, office of ISMP.

The **FDA/ISMP Safe Medication Management Fellowship** offers a healthcare professional an opportunity to work with medication safety experts at ISMP in Horsham, PA, for 6 months, and at the US Food and Drug Administration (FDA) Division of Medication Error Prevention and Analysis (DMEPA) in Silver Spring, MD, for 6 months.

The **ISMP International Medication Safety Management Fellowship** offers a healthcare professional (fluent in written and spoken English) an opportunity to work with US and international experts on global medication safety initiatives for 1 or 2 years at the Horsham, PA, office of ISMP.

All candidates must have at least 1 year of postgraduate clinical experience and relocate to the area. For details and an application, visit: www.ismp.org/node/871.

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Medications

- Medication classes associated with the highest rates of pharmacy-detected errors were antimicrobials (14%), anticoagulants (9%), colony-stimulating factor agents (8%), biologicals (8%), and antidotes (6%). Among these medications:
  - Errors with antimicrobials were most often associated with lack of renal dose monitoring/adjustments (69%), unclear or incomplete orders (17%), and allergies (5%).
  - Errors with anticoagulants were most often associated with lack of renal dose monitoring/adjustments (65%), duplicate therapy (18%), and unclear or incomplete orders (14%).
  - Errors with colony-stimulating factor agents, biologicals, and antidotes were most often associated with unclear or incomplete orders (89%, 77%, 83%, respectively) and duplicate therapy (9%, 18%, 11%, respectively).
- With the exception of antimicrobials and anticoagulants, medications prescribed infrequently by residents had the highest rates of prescribing errors.

Timing

- Resident errors were highest during the day (peaking in the morning), not at night as hypothesized, which the researchers believed may be due to the volume and type of daytime orders and multitasking.
- Resident errors were less frequent than expected during transition periods (7-9 a.m., 5-7 p.m.), which the researchers believed may be due to the use of handoff tools that limit such errors (e.g., SBAR [Situation, Background, Assessment, Recommendation]), or a failure to detect errors that originate during transition periods because they may not manifest right away.
- Evidence of the *July effect* was not found. Errors were most frequent in August and among the least frequent in July. The researchers thought that lower error rates in July may be due to heightened supervision during the first month of residency training, and higher error rates in August may be due to the residents' growing confidence and realization that all medication orders are verified by a pharmacist.

Training Level

- The highest frequency of medication e-prescribing errors occurred during PGY 1. The researchers believed that the decrease in errors observed between PGY 1 and PGY 2 may be due to better medication knowledge and familiarity with the EHR.
- The lowest frequency of medication e-prescribing errors occurred during PGY 2. PGY 1 and PGY 3 residents committed more errors than PGY 2 residents. The higher error rate of PGY 3 residents compared to PGY 2 residents was puzzling, as PGY 3 residents ordered the fewest medications. Possible explanations suggested by the researchers included an increase in patient and therapy complexities, fewer consultations with others before placing orders, and knowledge decay.
- Resident errors declined during the course of the academic year, with the odds of an error decreasing by 16% throughout the year.

Study Take-Aways[2]

The researchers made the following recommendations based on their conclusions regarding the study results.

Additional Resident Supervision

- Although autonomy fosters resident learning, do not withdraw resident supervision prematurely after the first month of training. The timing of errors suggests the need for increased supervision in August and September, not just in July.

Continued Pharmacy Support

- The frequency of resident e-prescribing errors underscores the need and value

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> SAFETY brief

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medication, lab test, patient, or other intended word or name from on-screen listings of "near hits." Seemingly, that would be helpful given that misspellings and missing letters are common reasons why a requested drug or patient does not appear on the screen. However, for medications, near hits for drug names are not safe. In fact, they can be downright dangerous if they lead to a practitioner selecting the wrong drug. Medication selection errors are frequent when similar drug names are presented in drop-down lists and computer screens, which occurs when the list of near hits is generated. These selection errors are often caused by confirmation bias, during which the practitioner fails to notice that the drug name is different than intended, or by simple human error in which the practitioner accidentally selects the drug name above or below the name he or she intended to select. In some cases, a practitioner may not realize that the generic name on the list does not match the intended brand name ordered, or vice versa.

To reduce the potential for such errors, Epic has advised customers to test the fuzzy matching functionality before use by entering the drug names on the *ISMP List of Confused Drug Names*, using typographical errors such as transposed or missing characters and misspellings. Users can then enter what Epic refers to as "stop words" to prevent them from being suggested by the fuzzy matching system. Unfortunately, users can only add 100 stop words to the system. The *ISMP List of Confused Drug Names* contains hundreds of name pairs that have been involved in errors or close calls that were reported to the ISMP National Medication Errors Reporting Program (ISMP MERP).

Some hospitals have conducted the suggested testing using the *ISMP List of Confused Drug Names* and found concerning matches—scary, in fact. For example, if you misspell daunorubicin as "dunorubicin," the near hit list will contain both daunorubicin and doxorubicin. Also, fuzzy matching will present only formulary medications. So, if daunorubicin is non-formulary but doxorubicin is on formulary, only doxorubicin will be listed as an option, even though it might

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of ongoing pharmacy review of all residents' medication orders, particularly given widespread alert fatigue that often leads to bypassing EHR error detection functionality.

- Establish safeguards when dispensing medications infrequently prescribed by residents.

Resident Education

- Educate residents about the specific kinds of errors that are common when ordering certain types of medications, particularly the 5 classes of medications most often involved in resident e-prescribing errors: antimicrobials, anticoagulants, colony-stimulating factor agents, biologicals, and antidotes.
- Educate residents about the differing types of errors seen with commonly versus less commonly prescribed medications.

Encourage Consultation

- Encourage PGY 3 residents to consult with other healthcare professionals when caring for complex patients or ordering medications prescribed infrequently.

Strengthen Renal Dosing/Monitoring Capabilities

- Establish a reliable plan to ensure medication dose adjustments and baseline/ongoing monitoring of patients with renal impairment occurs, particularly when certain anticoagulants and antimicrobials are prescribed. Until the EHR can integrate measures of creatinine clearance with drug prescribing, this may be best accomplished with a pharmacy renal dosing protocol that targets at-risk patients and medications.

References

1) van der Leeuw RM, Lombarts KM, Arah OA, Heineman MJ. A systematic review of the effects of residency training on patient outcomes. *BMC Med.* 2012;10:65.
2) Garber A, Nowacki AS, Chaitoff A, et al. Frequency, timing, and types of medication ordering errors made by residents in the electronic medical records era. *South Med J.* 2019;112(1):25-31. www.ismp.org/ext/153

Your *Reports* at *Work*

FDA tells pen injector needle manufacturers to improve patient instructions

Thanks to your reporting about patients who failed to remove the inner pen needle cover prior to administering insulin, the US Food and Drug Administration (FDA) has asked needle manufacturers to update labeling and improve patient instructions for use.

Standard pen needles have outer and inner needle covers, both of which must be removed prior to injection. However, hospitals often use safety needles for medication pens. These have an outer cover that must be removed, but there is no inner cover to remove. An inner shield over the needle automatically retracts during injection and covers the needle after injection to prevent needlestick injuries. After discharge, patients may receive standard pen needles from their pharmacy and not know that the inner needle cover must be removed, especially if they have not been taught this step while hospitalized. If the inner cover of a standard pen needle is not removed, patients may not receive the medication. ISMP and the American Society of Health-System Pharmacists (ASHP) published a National Alert Network (NAN) Alert about this issue (www.ismp.org/node/44) in October 2017.

In response to these concerns, FDA has asked needle manufacturers to review their labeling and educational materials and to update and clarify the need to remove the inner needle cover/cap before injection. The agency also requested manufacturers to add a warning in the labeling, such as: "Remove both the outer cover and the inner needle cover before an injection. If both the outer cover and the inner needle cover are not removed before use, the medication or dose may not be injected, which may result in serious injury or death." The FDA labeling request can be accessed at: www.ismp.org/ext/155.

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not be the intended drug. Some pharmacists have gone through most of the ISMP list and identified dozens of risk points. Here are a few examples that appeared on screens during testing (differences in formularies may result in different outcomes):

- If you type "alaprazolam" instead of alprazolam, you get estradiol transdermal (Alora)
- If you type "Arecept" instead of Aricept, you get Viracept
- If you type "cyclosorine" instead of cycloserine, you get cyclosporine
- If you type "Dilacar" instead of Dilacor (diltiazem), you get pilocarpine (Pilocar)

ISMP does not believe that fuzzy matching is currently safe for medication ordering. Fuzzy matching can be disabled for all search options, but not for medications only. It's either on or off. As soon as possible, Epic should prevent automatic enabling of fuzzy matching, and should allow the disabling of fuzzy matching for medications only. For now, the use of fuzzy matching is a risk not worth taking.

No errors have been reported to ISMP yet, but it's very early in the implementation phase for hospitals. If you are using this functionality, please report any errors to ISMP (www.ismp.org/MERP).

Special *Announcements*

NEW ISMP tool helps find and minimize your IV push medication safety gaps

ISMP has launched a new tool to help healthcare facilities identify and manage targeted risks associated with the use of intravenous (IV) push medications in adults. The **ISMP Gap Analysis Tool (GAT) for Safe IV Push Medication Practices** is designed to assist practitioners in evaluating their practices, pinpointing specific challenges and potential areas for improvement, and tracking progress over time. The GAT, which is based on the *ISMP Safe Practice Guidelines for Adult IV Push Medications*, consists of 50 assessment items. The tool is being made available at no charge, thanks to support from the Baxter Healthcare Corporation.

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FDA Advise-ERR

Lumoxiti has unique preparation instructions!

The US Food and Drug Administration (FDA) approved **LUMOXITI** (moxetumomab pasudotox-tdfk) injection in September 2018. Lumoxiti is a CD22-directed cytotoxin indicated for the treatment of adult patients with relapsed or refractory hairy cell leukemia who received at least two prior systemic therapies, including treatment with a purine nucleoside analog. The recommended dose is 0.04 mg/kg administered as an intravenous (IV) infusion over 30 minutes on days 1, 3, and 5 of each 28-day cycle. Lumoxiti is available as a 1 mg lyophilized cake or powder in a single-dose vial for reconstitution and further dilution.

It's important for healthcare professionals to know that the preparation of Lumoxiti requires an intravenous solution stabilizer (IVSS) component that is packaged separately from Lumoxiti. The IVSS component is supplied in a 1 mL vial and is packaged separately because more than one vial of Lumoxiti may be needed for the dose, but only one vial of IVSS should be used per infusion bag. Separate packaging also helps to avoid using an IVSS to dilute Lumoxiti.

The preparation of Lumoxiti in the pharmacy requires 3 steps:

1) **Calculate the dose:** Calculate the dose and number of Lumoxiti vials to be reconstituted based on the patient's actual metric body weight. Multiple vials of Lumoxiti will likely be needed for each dose. For example, the dose for a 70 kg patient would be 2.8 mg, requiring 3 vials.

2) **Reconstitute:** Reconstitute each Lumoxiti vial with 1.1 mL of *sterile water for injection* to yield a final concentration of 1 mg/mL (each Lumoxiti vial will contain an extractable volume of 1 mL [1 mg]).

3) **Dilute:** Add 1 vial (1 mL) of IVSS (packaged separately from Lumoxiti) to a bag containing 50 mL of 0.9% sodium chloride for injection; then add the required volume/dose of Lumoxiti solution from the reconstituted vial(s) (steps 1 and 2) to the infusion bag.

Consider the following to help prevent preparation errors with Lumoxiti:

- Review the prescribing information and *Healthcare Provider Instructions for Use* to obtain important information on dosing, preparing, and administering Lumoxiti.
- Ensure the IVSS is present before starting to prepare Lumoxiti, as IVSS is packaged separately from Lumoxiti.
- Use only 1 vial of IVSS per infusion bag of Lumoxiti, regardless of the number of vials of Lumoxiti needed per dose.
- Reconstitute each Lumoxiti vial with 1.1 mL of sterile water for injection. Do NOT reconstitute Lumoxiti vials with the IVSS.
- Refer to full prescribing information, which contains complete, step-by-step instructions for reconstitution, dilution, and administration.

ISMP thanks Casmir Ogbonna, PharmD, MBA, BCPS, BCGP (Safety Evaluator) and Hina Mehta, PharmD (Team Leader) from the FDA Division of Medication Error Prevention and Analysis (DMEPA) for contributing this FDA Advise-ERR.

Special Announcements

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Healthcare facilities that submit their findings to ISMP anonymously via a secure online portal by **March 31, 2019**, will receive a gap analysis score and will have access to aggregate data after the submission period. The aggregate data can be used to compare a facility's experiences to that of demographically similar healthcare facilities. Participation can also help facilities assess their compliance with requirements associated with management of IV push medications from regulatory or accrediting agencies such as the Centers for Medicare & Medicaid Services (CMS). For information and to access the GAT, visit: www.ismp.org/node/1188.

Don't miss the next Practitioner in Residence (PIR) mentorship session

Spend a week, **April 1-5**, being mentored by national medication safety experts as a **Practitioner in Residence** at ISMP's office in suburban Philadelphia, PA. Participants will learn to use ISMP's unique model for identifying and controlling areas of risk exposure, which can also help meet regulatory and accreditation requirements. Participants will also leave with comprehensive resources to support ongoing safety efforts at their organization. Spaces for the April session are going fast, so sign up soon. To learn more or to enroll, call Michelle Mandrack (215-947-7797) or visit: www.ismp.org/node/1218.

ISMP INSTITUTE FOR SAFE MEDICATION PRACTICES

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Report medication and vaccine errors to ISMP: Please call 1-800-FAIL-SAF(E), or visit our website at: www.ismp.org/MERP or www.ismp.org/VERP. ISMP guarantees the confidentiality of information received and respects the reporters' wishes regarding the level of detail included in publications.

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ISMP Medication Safety Alert!® ActionAgenda

One of the most important ways to prevent medication errors is to learn about problems that have occurred in other organizations and to use that information to prevent similar problems at your practice site. To promote such a process, the following selected items from the October – December 2018 issues of the *ISMP Medication Safety Alert!* have been prepared for leadership to use with an interdisciplinary committee or with frontline staff to stimulate discussion and action to reduce the risk of medication errors. Each item includes a brief description of the medication safety problem, a few recommendations to reduce the risk of errors, and the issue number to locate additional information. Look for our high-alert medication icon under the issue number if the agenda item involves one or more medications on the *ISMP List of High-Alert Medications* (www.ismp.org/node/103). The Action Agenda is also available for download in a Microsoft Word format (www.ismp.org/node/1336) that allows expansion of the columns in the table designated for organizational documentation of an assessment, actions required, and assignments for each agenda item. Continuing education credit is available for nurses at: www.ismp.org/nursing-ce.

Key: ⚠ — ISMP high-alert medication

Issue No.	Problem	Recommendation	Organization Assessment	Action Required/Assignment	Date Completed
Mix-ups between epidural bupivacaine and intravenous (IV) antibiotics in labor and delivery (L&D) units					
(20) ⚠	Mix-ups in L&D between epidural bupivacaine and 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 (BCMA) system, and drug shortages. Both mothers and babies are without long-term sequelae, but prior IV administration of epidural bupivacaine has resulted in fatalities.	Educate staff about the risk of mix-ups due to look-alike bags. During drug shortages, warn staff about changes in product appearance, labeling, container sizes, and concentrations. Use colored overwraps or a different size/shape container for epidural analgesia to differentiate it from IV infusions. Dispense epidural analgesia with yellow-striped epidural tubing. The practitioner administering the epidural analgesia should bring it to the bedside immediately before use. Require use of a BCMA system.			
503B outsourcers express per mL strength prominently leading to dosing errors in both perioperative locations and patient care units					
(20)	The label format used by some 503B outsourcers has led to dosing errors and confusion when the per mL strength is expressed prominently on syringe, vial, and infusion bag labels. Overdoses have occurred when the per mL amount was confused as the total container amount.	When purchasing outsourced products, require labeling that follows the same USP <7> standard to which commercial manufacturers are held—prominently expressing the drug strength per total volume in the container, followed by the strength per mL in parentheses.			
Mix-up between lidocaine and fentaNYL in the perioperative area					
(22) ⚠	An anesthesiologist administered IV lidocaine 2% instead of fentaNYL. Both products had blue colored caps (which is the standard color for opioids on anesthesia user-applied labels) and were stocked upright in the anesthesia tray so only the caps were showing before removal.	Barcode scanning in the perioperative area should be used. Set up anesthesia carts and automated dispensing cabinets so vial labels (not just caps) are visible. Do not store look-alike vials near one another. Provide one drug in a prefilled syringe and the other in a vial.			

Issue No.	Problem	Recommendation	Organization Assessment	Action Required/Assignment	Date Completed
Thinking of "tPA" and "TXA" leads to confusion between alteplase and tranexamic acid					
(21) ⚠	Practitioners still think of alteplase and tranexamic acid by their error-prone abbreviations, "tPA" and "TXA." A nurse mentally confused the abbreviations and removed tranexamic acid instead of alteplase from an automated dispensing cabinet left on full access mode. A prescriber mentally mixed up the abbreviations and prescribed tranexamic acid instead of alteplase for a stroke patient.	Avoid abbreviations for drug names, including "tPA" and "TXA." Instead, refer to medications by their generic and/or brand names only and include an indication with medication orders to further avoid confusion. Alert prescribers to the risk of mental mix-ups between look- and sound-alike error-prone drug name abbreviations, such as "tPA," "TXA," "TNK," and "TPN."			
Peel-off label on rocuronium vial leads to confusion					
(21) ⚠	Some rocuronium products include a peel-off label on the vial (for syringe labeling) that lists the strength per mL. This label covers the vial label, which lists the total amount of drug per total volume (USP <7>). The strength on the peel-off label has led to confusion regarding the total amount of drug in the vial.	If your facility uses products with peel-off labels, implement strategies to ensure staff are aware of the total amount of drug in the vial. Peel-off labels should be included on a separate card or attached in a way that does not cover the total amount of the drug per total volume or other important information.			
Misuse of pen needles can result in patients not receiving medication					
(20)	Standard pen needles used by patients at home have outer and inner needle covers that must be removed before injection. Safety pen needles used in hospitals have an outer needle cover that must be removed and an inner needle shield that retracts. Patients taught to use a pen with a safety needle may forget or not know to remove the inner cover of a standard pen needle, thus blocking administration.	When teaching patients to self-inject medications from a pen, make them aware of the different types of pen needles available and teach them to remove the proper pen needle covers. Whenever possible, use the type of pen needle for training that the patient will use at home. Use the teach back method and ensure the patient can demonstrate the correct administration technique.			
Packaging of GLEOLAN (aminolevulinic acid) oral optical imaging solution may lead to inadvertent intravenous (IV) administration					
(25)	Gleolan oral solution comes as a lyophilized powder packaged in a 50 mL single-dose vial that looks just like vials used for parenteral medications, risking IV administration. A "For Oral Use Only" warning on the label is printed in red type on a black background and is hard to see.	To prevent inadvertent IV administration, pharmacy should reconstitute the medication, transfer the patient-specific dose to an oral medicine bottle, and clearly label the bottle with directions for the patient to drink the oral solution 2-4 hours prior to the start of anesthesia.			

Issue No.	Problem	Recommendation	Organization Assessment	Action Required/Assignment	Date Completed
Subcutaneous and intramuscular (IM) EPINEPHrine withdrawn from glass ampule does not need filtration					
(23) ⚠	The ***ISMP Safe Practice Guidelines for Adult IV Push Medications*** recommend using a filter needle when withdrawing IV push medications from glass ampules. However, for **EPINEPH**rine supplied in a glass ampule, filter needles may add another step when preparing an emergency subcutaneous or IM dose, delaying lifesaving treatment.	ISMP does NOT recommend using a filter needle for subcutaneous or IM injections of emergency **EPINEPH**rine withdrawn from glass ampules. The small-bore needle would likely prevent glass fragments from being drawn into the syringe. Using **EPINEPH**rine autoinjectors avoids the issue and prevents dosing errors and IV administration.			
Generic EPINEPHrine 0.15 mg autoinjectors do not use the abbreviation "Jr"					
(24) ⚠	Brand **EPINEPH**rine autoinjectors (**EPIPEN**, **EPIPEN Jr**) use "Jr" on the 0.15 mg strength to help identify that it should be used for patients weighing 15 to 30 kg. Generic autoinjectors list only the metric strength (0.15 mg, 0.3 mg) and not the "Jr" designation for the 0.15 mg strength.	If using generic **EPINEPH**rine autoinjectors, educate practitioners (and consumers) about the lack of the "Jr" designation on the 0.15 mg strength product and which strength should be used based on the patient's weight.			
Dosing error with WINRHO SDF (Rh_o[D] immune globulin [human, anti-D])					
(22)	While verifying a WinRho SDF dose, a pharmacist noticed that the prescribed dose was 4,000 mcg (equivalent to 20,000 units) but the syringe was labeled 4,000 units. The wholesaler and pharmacy computer only listed the strength in units. The wrong strength (in units) was ordered from the wholesaler and used to prepare the dose.	Until labeling changes are made by the manufacturer to a single dosing unit, standardize the way the strength for WinRho SDF is displayed in computer systems, both for ordering products from wholesalers as well as for prescribing and dispensing the product.			
Migalastat (GALAFOLD) and miglustat (ZAVESCA) look and sound alike					
(22)	Migalastat (for Fabry disease) and miglustat (for type 1 Gaucher disease) look and sound alike. Both drugs are only available in a single strength capsule (123 mg for migalastat; 100 mg for miglustat), so the dose may be omitted when ordering. Also, the odd migalastat strength of 123 mg may be viewed as a dosing mistake.	Store these products apart and refer to them by brand and generic names. Use barcode scanning during product selection and administration. Add an order entry/verification alert to warn about possible mix-ups or require a hard stop to verify the diagnosis. ISMP is considering the application of tall man letters.			

Issue No.	Problem	Recommendation	Organization Assessment	Action Required/Assignment	Date Completed
Message codes on ACCU-CHEK Inform II and possibly other glucometer result screens can cause confusion					
(21) ⚠	A study found that the abbreviation RR LO (out of reportable range; low limit) on glucometer result screens led staff to believe the patient had a high glucose level requiring insulin, when it was critically low requiring glucose. Mistakes were prevalent when RR LO was paired with a numerical error code (e.g., W-510), which was misunderstood as a blood glucose level. Mistakes are possible with other screen abbreviations (e.g., RR HI, CR HI).	Configure the result screen on your facility's glucometer to display the patient's numeric blood glucose level in order to eliminate the risk of treatment errors caused by abbreviations. Work with the manufacturer of your glucometer, if necessary, to achieve this. Teach staff how to interpret glucometer result messages.			
Survey results: Unsafe practices persist with adult intravenous (IV) push medications					
(22, 23)	Results from our 2018 survey on adult IV push medication practices revealed unsafe practices that have persisted, including: 1) Using prefilled syringes or cartridges as vials; 2) Diluting IV push medications despite their availability in a ready-to-administer form; 3) Diluting or reconstituting medications in a prefilled saline flush syringe, which leads to a mislabeled syringe; and 4) Failing to label syringes of IV push medications prepared away from the patient's bedside. The survey also identified conditions that foster these unsafe practices, such as ongoing drug shortages, teaching these unsafe practices during orientation, mistaken beliefs, and system vulnerabilities.	Dispense IV push medications in ready-to-administer, prefilled syringes when possible, and ensure cartridge holders are available. Require pharmacy to dilute medications if necessary. If nurse dilution of unstable medications is necessary, provide standardized guidelines. Do not allow dilution/reconstitution in saline flush syringes. Provide units with syringe labels and require labeling of syringes prepared away from the bedside. Assess orientation content to ensure staff are not teaching new clinicians unsafe practices. Utilize the ***ISMP Gap Analysis Tool for Safe IV Push Medication Practices*** to identify opportunities for improvement (www.ismp.org/node/1188).			
KENALOG-40 (triamcinolone) injection labeling is causing overdoses					
(25)	A patient received 200 mg instead of 40 mg of Kenalog-40 injection from a 5 mL vial on which the total dose per volume (200 mg/5 mL) is listed less prominently than the product name, Kenalog-40. The drug is available in 40 mg (1 mL) vials, but the 5 mL vials (200 mg) were received in error. Despite recent label revisions, "40" is still part of the Kenalog-40 brand name.	If your facility uses the brand Kenalog-40, check the volume of the vials as soon as they are received to ensure you have the intended size (1 mL or 5 mL). If both vial sizes are used, circle the strength and vial size to increase awareness. Require the use of barcode scanning for product selection and administration.			