March 2026 | Volume 24 ■ Issue 3

ISMP Institute for Safe Medication Practices
An ECRI Company

Nurse AdviseERR®

Educating the Healthcare Community About Safe Medication Practices

what's in a Name?

The "-flozin" drug stem name

By Kara Jensen, PharmD, BCPS; 2025-2026 ISMP Safe Medication Management Fellow, supported by the US Army

Medications that end with the suffix "-flozin" belong to a class of oral medications known as sodium-glucose cotransporter 2 (SGLT2) inhibitors and are primarily used to treat type 2 diabetes. These drugs work by helping the kidneys flush out extra glucose through the urine, and in turn lower blood glucose levels. These drugs can also help reduce fluid volume, which has an added benefit for blood pressure and cardiovascular health. Notably, SGLT2 inhibitors have demonstrated protective effects on the heart and kidneys, even in some individuals without diabetes, making them valuable beyond glycemic control. Therefore, they also are used to treat chronic kidney disease, helping to slow disease progression and reduce the need for dialysis; and heart failure, by lowering the risk of flare-ups.

Currently, there are six single-agent SGLT2 inhibitors and seven combination products available in the United States (**Table 1**). While all share the same mechanism of action, subtle differences exist in their pharmacokinetic profiles and approved indications. For example, ertugliflozin and bexagliflozin are restricted to adults, while canagliflozin, dapagliflozin, and empagliflozin have approval for use in pediatric patients older than 10 years of age.

Table 1. List of SGLT2 and combination products available in the United States.

Generic Name(s)	Brand Name(s)	Key Notes
bexagliflozin	**BRENZAVVY**	SGLT2 inhibitor
canagliflozin	**INVOKANA**	
dapagliflozin	**FARXIGA**	
empagliflozin	**JARDIANCE**	
ertugliflozin	**STEGLATRO**	
sotagliflozin	**INPEFA**	SGLT1 and SGLT2 inhibitor
Combination Medications		
canagliflozin/met**FORMIN**	**INVOKAMET**; **INVOKAMET XR**	SGLT2 inhibitor and biguanide
dapagliflozin/met**FORMIN**	**XIGDUO XR**	
empagliflozin/met**FORMIN**	**SYNJARDY**; **SYNJARDY XR**	
ertugliflozin/met**FORMIN**	**SEGLUROMET**	
empagliflozin/linagliptin	**GLYXAMBI**	SGLT2 inhibitor and DPP-4 inhibitor
ertugliflozin/**SIT**agliptin	**STEGLUJAN**	
empagliflozin/linagliptin/met**FORMIN**	**TRIJARDY XR**	SGLT2 inhibitor, DPP-4 inhibitor, and biguanide

The newest SGLT2 inhibitor, sotagliflozin, was approved by the US Food and Drug Administration (FDA) in 2023. Sotagliflozin has dual action as an SGLT2 inhibitor and a sodium-glucose cotransporter 1 (SGLT1) inhibitor. It is currently indicated to reduce the risk of cardiovascular

continued on page 2 — what's in a Name? >

SAFETY wires

Irrigation solution infused intravenously. A nurse administered 0.9% sodium chloride irrigation solution intravenously (IV) to a patient in the emergency department (ED) instead of the prescribed 0.9% sodium chloride injection solution. Both products (ICU Medical) come as 1-liter bags, and the word "Irrigation" or "Injection" is printed in a smaller font, below the name of the solution (**Figure 1**). The hospital lacks 24/7 central supply and pharmacy services. Over the weekend, the ED ran out of 0.9% sodium chloride injection, so a nurse sought out product to restock it. Due to a shortage of 0.9% irrigation bottles, central supply had purchased 0.9% irrigation bags and stored them near cardboard boxes containing 0.9% sodium chloride injection. The organization has not implemented barcode medication administration (BCMA) in the ED.

Figure 1. ICU Medical's 1-liter bag of 0.9% sodium chloride irrigation solution (left) was administered IV instead of 0.9% sodium chloride injection (right).

It is time for all organizations to use barcode scanning when receiving, dispensing, restocking storage locations, and before administration. The ISMP Targeted Medication Safety Best Practices for Hospitals, Best Practice 18, calls for maximizing the use of barcode verification

continued on page 2 — SAFETY wires >

what's in a Name?

continued from page 1

death, hospitalization for heart failure, and urgent heart failure visits in adults with heart failure or type 2 diabetes mellitus, chronic kidney disease, and other cardiovascular risk factors.

Several of the combination products are available with met**FORMIN**, an antidiabetic agent belonging to the biguanide drug class. Others are combined with another class of oral antidiabetic agents, dipeptidyl peptidase 4 (DPP-4) inhibitors. And one combination product, **TRIJARDY XR**, includes all three classes.

SGLT2 inhibitors are typically administered orally, usually once daily in the morning. Specific instructions may vary slightly depending on the chosen medication, but generally, they can be taken with or without food. SGLT2s are not recommended during pregnancy, especially in the second and third trimesters due to potential adverse effects on renal development in the fetus. Additionally, patients should not breastfeed while using any of the SGLT2 medications.

When managing patients taking SGLT2 inhibitors, monitoring is crucial. Healthcare providers should watch for signs of dehydration, assess kidney function, and inquire about genitourinary symptoms. Common side effects include increased urination, yeast infections, and urinary tract infections. Less common, but important side effects to be aware of include severe joint pain and upper respiratory tract infections. It is also vital to be vigilant for a rare but serious complication, euglycemic diabetic ketoacidosis (euDKA). This condition is characterized by elevated blood acid levels despite relatively normal blood sugar. This makes it more difficult to diagnose since the hyperglycemia (blood glucose greater than 250 mg/dL) typically associated with "classic" DKA is often absent. Therefore, patients should be educated about the symptoms of euDKA (i.e., nausea, vomiting, abdominal pain, weakness, confusion) and instructed to seek immediate medical attention if they occur. Educating patients about proper hygiene, emphasizing hydration, and encouraging prompt reporting of any unusual symptoms is essential. Lastly, during illness or before surgery, patients may need to temporarily discontinue the medication, resuming it only when they are well and eating normally.

Barcode scanning is crucial to prevent mix-ups with similar-looking heparin bags

A nurse went to remove a bag of heparin 1,000 units/500 mL from the automated dispensing cabinet (ADC) for a patient in the operating room (OR). She discovered bags of heparin 25,000 units/250 mL had been placed in the heparin 1,000 units/500 mL bin and notified the pharmacy. Both products by Hospira are supplied in clear bags with similar red fonts on the labels (**Figure 1**). This hospital had not yet implemented barcode medication administration (BCMA) scanning prior to administration in the OR.

Upon investigation, the hospital found that although pharmacy technicians were expected to scan medication barcodes and cabinet barcodes when restocking the ADC, scanning is not required by the system and could be bypassed. In addition, both heparin bags were stored near each other in the pharmacy. The pharmacy purchased Hospira's 1,000 units/500 mL heparin bags because their usual supplier experienced a supply chain interruption. After this event, due to the concern for mix-ups with Hospira's 25,000 units/250 mL bags, the pharmacy blocked staff from purchasing Hospira's 1,000 units/500 mL heparin in the ordering system.

Figure 1. Bags of heparin 25,000 units/250 mL (left) and heparin 1,000 units/500 mL (right) look similar.

continued on page 3 — Barcode scanning >

>SAFETYwires

continued from page 1

prior to medication administration by expanding use beyond inpatient care areas, and specifically targeting clinical areas with a short or limited patient stay, including the ED. When possible, purchase irrigation bottles or larger bag sizes (e.g., 2 or 3 liters) rather than 1-liter bags that could be mistaken as infusions. When central supply purchases an alternative item during drug shortages, the pharmacy must be notified and should then conduct a review to identify potential risks with the product's design, including look-alike labeling and packaging. If risks are identified, consider purchasing the product (or one product of a problematic pair) from a different manufacturer. Store look-alike products separately and consider the use of signage or other warnings on the bags and in storage locations.

Titratable infusions call for an interdisciplinary approach. An organization reported a recent Joint Commission finding related to incorrect documentation of titratable medication infusions. The organization initially approached this by focusing solely on the perspective of the nurse—how do we get nurses to better document titration? However, organizations must understand this complex process and the need for unpacking latent conditions across the medication-use process, which leads to sharp end failures, like with documentation.

The challenge is not unique to this organization. Issues with titration orders continue to be a common Joint Commission finding, such as:

- Medications not administered based on the assessed level of condition
- Titrated medications not started and/or adjusted at prescribed rates
- Titrated medications not adjusted to meet patients' targeted clinical end points

Titratable infusions are often high-alert medications that bear a heightened risk of causing significant patient harm if used in error.

continued on page 3 — SAFETYwires >

> **Barcode scanning** — continued from page 2

The hospital also reported that Hospira's magnesium sulfate 20 g/500 mL bags (**Figure 2**) look similar to the heparin bags involved in the close call. A similar concern was reported to us last year, after bags of Hospira's magnesium sulfate 20 g/500 mL were restocked in the heparin 25,000 units/250 mL ADC bin.

We reached out to the manufacturer to recommend differentiating these heparin infusion bags by making the labels less similar. Use barcode scanning technology in the pharmacy to confirm that medications chosen for distribution to the ADC match the medications listed on the ADC fill report. Those loading the ADC should use barcode scanning to confirm the accurate placement of medications and confirm that each product is in the correct drawer, pocket, or bin. The ISMP Targeted Medication Safety Best Practices for Hospitals, Best Practice 18, calls for expanding the use of BCMA technology to short- and limited-stay locations such as perioperative areas.

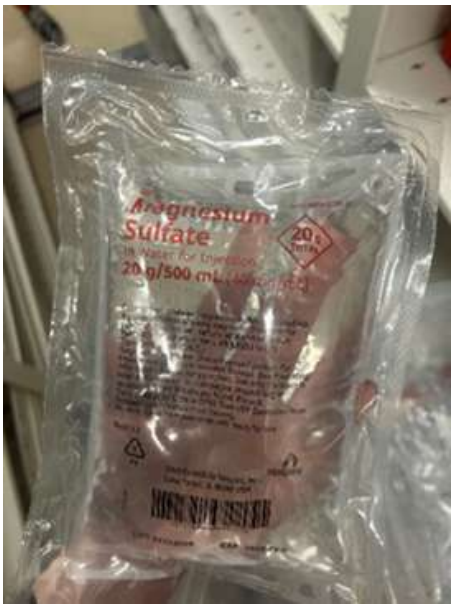

Figure 2. Hospira's 20 g/500 mL magnesium sulfate is supplied in clear bags with red font on the labels.

When pharmacy receives a new product, conduct a review to identify potential risks with the product's design, including look-alike labeling and packaging. If risks are identified, consider purchasing the product (or one product of a problematic pair) from a different manufacturer. Store look-alike products separately and consider the use of signage or other warnings in storage locations and on infusion bags. Educate nurses to carefully review individual product labels after removing the medication from the ADC, when spiking an IV bag, prior to administration (before scanning), and when discarding or returning it to storage.

Special Announcement

Doctor and nurse participants needed for study

Practitioners sometimes confuse drug names that look and sound alike. Researchers at Northwestern University invite you to participate in an online experiment studying drug name confusion errors. **The experiment takes about an hour and pays $100 upon completion.** To participate, you must be a physician or nurse who has prescribed or administered at least one medication in the United States in the past year (no more pharmacists are needed to sign up for this study at this time). If interested, email drugname.study@northwestern.edu.

ISMP Nurse *AdviseERR* (ISSN 1550-6304) **© 2026 Institute for Safe Medication Practices (ISMP)**. All rights reserved. Redistribution and reproduction of this newsletter, including posting on a public-access website, beyond the terms of agreement of your subscription, is prohibited without written permission from ISMP. This is a peer-reviewed publication.

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

Editors: Ann Shastay, MSN, RN, AOCN; Shannon Bertagnoli, PharmD; Jana O'Hara, MSN, RN, CPHQ, CPPS. ISMP, 3959 Welsh Road, #364, Willow Grove, PA 19090. Email: ismpinfo@ismp.org; Tel: 215-947-7797.

>SAFETY wires

continued from page 2

Organizations should use an interdisciplinary approach to evaluate the process of prescribing, verifying, administering, documenting, and monitoring titratable infusions. Ensure your titration orders are complete and easy for nurses to follow. Instead of starting with improving nurse documentation, examine the titration orders themselves with an interdisciplinary team. Ensure order sets include specific elements for titration such as the medication name, route, a starting rate (e.g., mg/minute), incremental units to increase or decrease the rate, frequency for incremental dose rate change (e.g., every 5 minutes), maximum dose rate, and an objective clinical endpoint (e.g., Richmond Agitation-Sedation Scale [RASS] score) for the infusion.

Also, review The Joint Commission Standards FAQs regarding the use of block charting, an option to document multiple dose/rate changes made to an infusion over a period of time. Block charting may be used when rapid titration of medication is necessary in specific, urgent/emergent situations defined in an organization's policy.

Nurse leaders and medication safety specialists should complete walkarounds to evaluate current practices and to ensure orders align with safe care standards. In addition, regularly review the documentation of monitoring parameters. Gather feedback from end users on issues and workarounds related to titratable infusions and develop mitigation strategies.

If not already done, plan for bidirectional (i.e., auto-programming and auto-documentation) smart infusion pump interoperability with the electronic health record (EHR). In addition, advancements in interoperability between systems and simplifying documentation processes for nurses may ensure accuracy and reliability by "making it easy to do the right thing." Currently, much of this relies on the nurse's memory. ISMP urges vendors to pursue innovations for integrating the EHR with infusion pumps and vital signs monitors.