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ISMP An ECRI Affiliate

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

Prevent administration of ear drops into the eyes

Problem: When a practitioner, patient, or caregiver accidentally instills ear drops into the eye, it may lead to an immediate burning and/or stinging sensation, and the patient may later experience pain, redness, swelling, or blurred vision. Patients may need to flush their eyes with water or normal saline and/or apply warm or cold compresses. Others may need to go to the emergency department (ED), an ophthalmology clinic, or their eye doctor for care.

Figure 1. Carbamide peroxide 6.5% ear drops by Major Pharmaceuticals (left) is packaged in a dropper bottle similar in size and shape to an eye drop container. **DEBROX** by Prestige Consumer Healthcare has a long neck for otic administration and the label states "EARWAX REMOVAL AID" in large font (right).

Aside from look-alike eye and ear medication names and containers, another reported reason for this type of error is confusion between the words "optic" and "otic." Also, practitioners and patients sometimes use the term "eyedropper" when referring to the container used to instill both eye and ear drops, which could invite an error in which the person reading the label fails to see unexpected information in plain sight, such as the product formulation, a warning, or a picture/icon of an eye or ear. The eyes and ears are relatively close together anatomically, which adds a "human anatomy factor" to the equation. While ear drops should never be used in the eyes, eye drops are made to be gentle and are sometimes used in the ears due to cost or availability. This practice can contribute to practitioners using products interchangeably. While barcode scanning can prevent administration to the wrong patient and confirm the right product, it does not ensure the medication will be given via the correct route.

It has been more than 15 years since we warned that ear drops are frequently administered into patients' eyes (www.ismp.org/node/926). However, recent reports suggest wrong route errors still occur.

*A prescriber ordered two eye drops and one ear drop, carbamide peroxide (for earwax accumulation), for a patient. The patient's nurse utilized barcode scanning to verify the medications were correct. However, the nurse administered all drops via the ophthalmic route. The nurse was used to carbamide peroxide being dispensed in a bottle with a long neck, making it obvious that it was an otic formulation. However, before this event, the nurse had requested a replacement bottle from the pharmacy, and this time it was dispensed in a bottle resembling an ophthalmic container (**Figure 1**).*

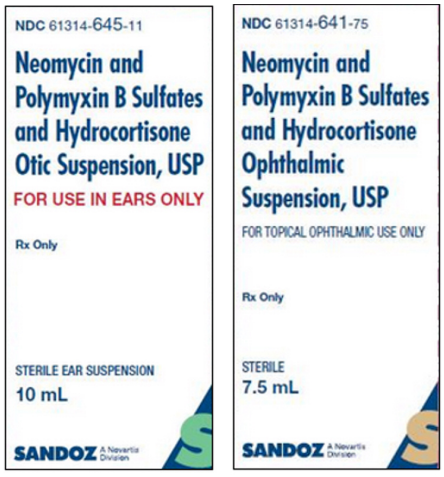

Figure 2. The carton of neomycin, polymyxin B, and hydrocortisone otic suspension (left) states "FOR USE IN EARS ONLY," but this can be overlooked when eye (right) and ear product cartons look similar.

A telehealth provider prescribed what they thought was neomycin sulfate 3.5 mg/mL, polymyxin B 10,000 units/mL, and hydrocortisone 1% ophthalmic drops for a patient with conjunctivitis. After picking up the medication

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SAFETY briefs

Prefilled glass syringes incompatible with certain needlefree connectors.

Due to drug shortages of certain vials or prefilled syringes of emergency medications, including atropine and naloxone injection, some hospitals have been providing prefilled glass syringes instead. However, certain needlefree syringe connectors for intravenous (IV) lines, called Luer-activated valve (LAV) connectors, are incompatible with prefilled glass syringes. We first reported this issue in April 2021 after receiving reports of naloxone injection failures when attached to MicroClave needlefree syringe connectors (www.ismp.org/node/42880). Now with

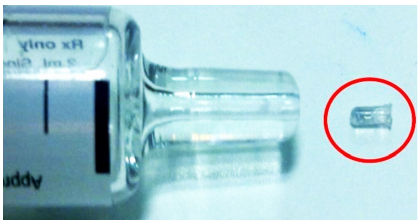

Figure 1. After connecting a glass syringe to the LAV connector, the pin from the connector became clogged in the syringe tip.

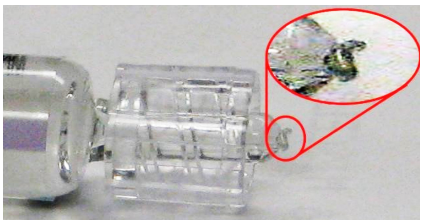

Figure 2. Pin from the LAV connector removed from the syringe tip.

the current drug shortages, the problem has increased. ISMP and the US Food and Drug Administration (FDA) have received multiple reports from practitioners who have been unable to inject a medication into an IV line once the prefilled glass syringe has been connected to the needlefree system. Evidently, inserting the glass syringe tip can cause the pin in the MicroClave needlefree access system to break off in the syringe tip, preventing delivery of the medication. In some events, a piece of plastic was

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*and instilling 4 drops into their eye, the patient felt severe burning. They read the label and realized the product was an otic suspension. The patient flushed their eye with water, but it did not relieve the pain. (An example of look-alike cartons is shown in **Figure 2**, page 1.)*

SAFE PRACTICE RECOMMENDATIONS: To reduce the risk of administering ear drops into the eyes, consider the following recommendations:

Storage. Keep medications in their original cartons, as icons of an ear or eye (**Figure 3**) are sometimes on boxes but not on dropper bottles. Separate the storage areas for ear and eye drop bottles on pharmacy shelves and in automated dispensing cabinets (ADCs).

Prescribing. Build order sets/sentences in the electronic health record (EHR) to guide prescribers to select the appropriate route, and automatically link the order with the corresponding product formulation. Specify the route of administration (e.g., right eye, left eye, each eye) and never use the abbreviations OD, OS, or OU, which can be mistaken as AD, AS, or AU (e.g., right ear, left ear, each ear) (www.ismp.org/node/8). Restrict prescribers from ordering ear drops for the "eye."

Figure 3. Examples of standard graphics that manufacturers can use on cartons and container labels to visually portray use in the ear (left) or the eye (right).

Dispensing. Utilize barcode scanning before dispensing. Consider placing an auxiliary label with a photo of an ear or eye on the dropper bottle to specify "ear" or "eye" drops.

Administration. When possible, administer ear drops and eye drops on different schedules (e.g., if given once daily). Use barcode scanning before administration and confirm the medication, route, and indication with the patient before administering ear drops or eye drops. Immediately dispose of any discontinued product.

Patient education. Confirm the expected route with the patient. Counsel patients using the teach-back method to reinforce the route. Educate patients to keep ear and eye drops in the carton, store them in separate locations at home, and discard any leftover medication.

Recommendations for manufacturers. We encourage manufacturers to consider strategies to reduce the risk of ear versus eye wrong route errors, including differentiating the container (e.g., bottle with a long neck for otic formulations), packaging, and labeling, and adding prominent standard text (e.g., "For use in ears only") to the respective carton and container labels. Also add standard graphics that visually depict the ear or eye (**Figure 3**) to the carton and/or container labels (www.ismp.org/ext/930).

Sulfa, sulfur, sulfite, and sulfate allergy confusion

PROBLEM: A prescriber ordered a dose of sulfamethoxazole-trimethoprim, a sulfonamide antimicrobial agent, for an emergency department (ED) patient with a urinary tract infection. Approximately 15 minutes after the nurse administered the dose, the patient experienced a throat-closing sensation, flushing, and shortness of breath. The patient's symptoms improved after the nurse administered **EPINEPH**rine, methyl**PREDNIS**olone, famotidine, diphenhydr**AMINE**, and intravenous fluids. The prescriber reviewed the patient's medical record and saw that the patient had a documented allergy to "sulfur." When the prescriber placed the order for the sulfonamide antimicrobial agent, an allergy alert did not fire, and the medication was auto-verified without a prospective pharmacist review. The organization reviewed the medical records for the health system and found that more than 1,600

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found lodged inside the syringe tip (nozzle), effectively blocking the flow of medication (**Figures 1** and **2**, page 1).

FDA released an alert (www.ismp.org/ext/1046) on November 22, 2022, regarding LAV internal pins breaking after practitioners attached prefilled glass syringes. This problem has involved glass syringes from Aurobindo Pharma, Dr. Reddy's Laboratories, and most recently, Accord Healthcare (atropine sulfate prefilled glass syringes). As FDA points out, incompatibility can delay therapy, particularly in emergent and urgent situations, and potentially result in serious harm. FDA has requested LAV connector manufacturers to update the labeling on their products to warn practitioners that connectors with an internal pin may not be compatible with prefilled glass syringes. For now, FDA recommends:

- Inform staff that compatibility issues may occur when using prefilled glass syringes with LAV connectors with an internal pin.
- Review the instructions on LAV connectors used in your organization to determine if they have an internal pin and/or contact the manufacturer to confirm.
- Stock medications that come in plastic prefilled syringes or vials (when possible), or purchase connectors that do not use an internal pin.
- If your facility uses LAV connectors with an internal pin and medications packaged in prefilled glass syringes, establish and implement a plan to ensure the safe administration of these drugs.

The images used in this article are from the FDA alert (www.ismp.org/ext/1046).

HIGH-ALERT

QuVa Pharma two-sided labels for IV bags. We are pleased to share that intravenous (IV) bag labels by QuVa Pharma, a 503B outsourcing facility, will have significant improvements so that practitioners can view product information from both sides of the bag (www.ismp.org/ext/1043). The oxytocin IV bag (**Figure 1**, page 3) will be the first product with these new labels to be released in early 2023, with additional IV bags with these labels to follow later next year. The front of the IV bag label contains the required drug/dosing information, barcode, and important warnings, while the back of

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patients had a documented allergy to "sulfur." To mitigate this, they created an alert to review the patient's allergy history and to update the documented allergy to the actual medication that caused the reaction.

In an August 11, 2022, ***SAFETY* brief**, we discussed common myths surrounding iodine and allergic cross-reactivity with shellfish and iodine-based medications. Similarly, sulfa, sulfur, sulfite, and sulfate allergies can also lead to confusion. Like iodine, sulfur is an element that is present throughout the human body, and as such, cannot elicit an allergic response. Sulfates are found in some medications (e.g., morphine sulfate, heparin sulfate), soaps, and detergents. Sulfite preservatives, also called sulfur dioxide and metabisulfites, are found in wine and dried fruits and vegetables. These agents may cause skin or eye irritation, or asthma-like symptoms, rhinitis, or urticaria if inhaled, but rarely result in anaphylactic-like reactions. These reactions are not immune-related and are not linked with cross-reactivity to sulfonamide antimicrobials or sulfur-containing medications.

Unfortunately, practitioners may tell patients who react to a sulfonamide antimicrobial agent (e.g., sulfamethoxazole, sulfacetamide, sulf**ADIAZINE**) that they have a "sulfur" allergy, which can lead to confusion. Although sulfonamide antimicrobials are commonly reported as a source of medication allergies, it is estimated that only 3% of these allergies represent true hypersensitivity reactions.[1,2] Also, many other medications contain the sulfonamide chemical component but are structurally different from sulfonamide antimicrobials and lack the characteristic side chains that are attributed to allergic reactions. Examples of these medications include carbonic anhydrase inhibitors (e.g., aceta**ZOLAMIDE**, dorzolamide), diuretics (e.g., furosemide, hydro**CHLORO**thiazide), sulfonylureas (e.g., gly**BURIDE**, glimepiride), protease inhibitors (e.g., darunavir, fosamprenavir), and others (e.g., **SUMA**triptan, topiramate). However, some agents pose a risk of cross-reactivity or hypersensitivity reactions. They include sulfa**SALA**zine, which releases sulfapyridine (a possible sulfonamide antimicrobial cross-reactive agent); dapsone (a sulfone agent), which produces hypersensitivity similar to that seen with sulfonamide antimicrobials and has unclear cross-reactivity; and celecoxib, which, while not a sulfonamide antimicrobial cross-reactive agent, carries a risk of Stevens-Johnson syndrome (SJS) and may require caution when used in patients with febrile or blistering reactions to sulfonamide antimicrobials.[3]

SAFE PRACTICE RECOMMENDATIONS: Remove "sulfur" as an option for users to select when adding an allergy to a patient's chart. Educate staff, including pharmacy technicians and medical assistants, to avoid documenting that a patient is allergic to "sulfa" and instead document the specific medication that caused the adverse reaction, along with the specific reaction and symptoms. Patients with an allergy to sulfonamide antimicrobials are at no greater risk of reacting to sulfates, sulfites, or other elemental sulfur products.

For patients with a history of non-life-threatening reactions to a sulfonamide antimicrobial agent, with no other non-antimicrobial sulfonamide reactions, there may be some risk of reacting to a non-antimicrobial sulfonamide; however, the risk may be equivalent to those with allergies to a medication in a different drug class, so avoidance is likely not necessary.

Use caution for patients with severe sulfonamide antimicrobial allergies (e.g., anaphylaxis, SJS), with multiple allergies, or with allergies to other non-antimicrobial sulfonamide agents, as this is where the data show there is a higher possibility of increased risk of reactions. In these cases, practitioners must evaluate the risks and benefits, and consider test dosing or desensitization in a controlled environment.[4]

References

1) Ponka D. Approach to managing patients with sulfa allergy: use of antibiotic and nonantibiotic sulfonamides. *Can Fam Physician.* 2006;52(11):1434–8.
2) Slatore CG, Tilles SA. Sulfonamide hypersensitivity. *Immunol Allergy Clin North Am.* 2004;24(3):477–90.
3) Montanaro A. Sulfonamide allergy in HIV-uninfected patients. Adkinson NF, Feldweg AM, eds. UpToDate. Waltham, MA: UpToDate Inc. Accessed September 7, 2022. www.uptodate.com
4) Australasian Society of Clinical Immunology and Allergy (ASCIA). Sulfonamide antibiotic allergy: information for patients, consumers and carers. 2019:1-2. Accessed September 7, 2022. www.ismp.org/ext/1041

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the label contains the drug name and concentration in large font so practitioners can see it when looking through the IV bag solution from the back side. The new label will help differentiate oxytocin bags from hydrating solutions and magnesium infusions as suggested in the ***ISMP Targeted Medication Safety Best Practices for Hospitals***, Best Practice #17 (www.ismp.org/ext/986).

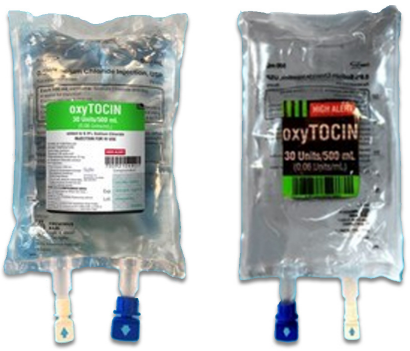

Figure 1. Practitioners can view the new and improved oxytocin IV bag label from the front (left) and back (right) sides of the IV bag.

Employment opportunity

ISMP is seeking a full-time pharmacist with at least 5 years of experience in the community and specialty pharmacy practice settings. In addition, 3 years of experience in managing performance improvement projects and writing articles and proposals are required. This **Medication Safety Specialist** position will support our membership services initiative. For more information and to apply for the position, please visit: www.ismp.org/node/20395.

To subscribe: www.ismp.org/node/10

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Walk the Red Carpet with Safety Stars

ISMP 25th Annual Cheers Awards

Join us on Tuesday evening, **December 6, 2022**, at 6:00 pm for the ISMP 25th Annual Cheers Awards at Stoney's Rockin' Country in Las Vegas. The awards will celebrate a group of healthcare leaders who are shining bright and have developed innovative strategies that resulted in sustained improvements in patient safety.

You can help honor this year's blockbuster Cheers Award winners **by making a donation and/or attending the awards dinner.** Your participation helps bring attention to safety advances and enables ISMP to continue the core of its lifesaving work – preventing medication errors. To make a donation and/or register for the dinner, please visit: **www.ismp.org/node/34185.**

Keynote Speaker and Lifetime Achievement Award Winner:
Michael R. Cohen, RPh, MS, ScD (hon), DPS (hon), FASHP

ISMP ACTIVITIES AT THE 2022 ASHP MIDYEAR MEETING IN LAS VEGAS

Workshop *(registration required)*

Thursday, December 1 & Friday, December 2
Medication Safety Intensive
7:30 am – 4:30 pm ET
Virtual format
To register, visit: www.ismp.org/node/32779

Symposium *(at Mandalay Bay North Convention Center)*

Monday, December 5
Optimizing Sterile Compounding Best Practices: Leveraging Technologies and Removing Barriers to Improve Safety

11:30 am – 1:00 pm PT, Doors open at 10:45 am
Room: South Pacific J, Lower Level
To register, visit: www.ismp.org/node/45374

Educational Sessions with ISMP Speakers

Sunday, December 4
The Pharmacy Team: A Patient Safety Anchor in a Turbulent Sea
1:00 pm – 4:00 pm PT
Room: Islander Ballroom I, Lower Level

Tuesday, December 6
High on Safety: Practical Approaches to Becoming Highly Reliable
8:00 am – 9:15 am PT
Room: Breakers C, Level 2

Wednesday, December 7
ISMP Medication Safety Update 2022
2:00 pm – 3:30 pm PT
Room: Breakers C, Level 2

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