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Educating the Healthcare Community About Safe Medication Practices

# Analysis of Estradiol Transdermal Patch Errors Highlights Safety Gaps – Part II

**Problem:** In the article Analysis of Estradiol Transdermal Patch Errors Highlights Safety Gaps – Part I, published in our July 2026 issue, we discussed errors associated with estradiol transdermal patches. Estradiol transdermal patches are medicated adhesive systems applied to intact skin such as the lower abdomen, hips, and upper buttocks to deliver estrogen continuously into the bloodstream for hormone replacement therapy (HRT) and relief of menopausal symptoms such as night sweats and hot flashes. We reviewed the widespread scope of patch-related errors, commonly involved products, and contributing factors associated with the errors (**Box 1**). To prevent errors with estradiol patches, both medical offices and community pharmacies should consider the following risk-reduction strategies.

## Risk Assessment

- Conduct a risk assessment of estradiol transdermal patches to determine risks and identify system-based strategies to safeguard the prescribing and dispensing of these products.

## Medication History

- Collect a medication history from each patient. Use standardized questions to identify all medications and substances that may not be readily identified by patients. Specifically question patients regarding the use of any type of transdermal patch.

## Prescribing

- Within electronic prescribing systems, develop standardized order sentences that clearly include the correct patch application frequency and automatically link to the appropriate formulation.
- Include brand names when prescribing estradiol patches since they have different application frequencies.
- Ensure directions match the formulation selected, especially when switching between products. Explore whether clinical decision support (CDS) can be leveraged to alert prescribers when the entered frequency for a patch is more or less frequent than indicated for that specific patch (e.g., it would alert if a once-weekly patch is entered as twice weekly).

**Box 1.** Identified factors contributing to errors involving estrogen transdermal patches.

- Differences in dosing frequency between once-weekly and twice-weekly formulations
- Multiple active prescriptions for different strengths
- Similar product names and packaging labeling
- Increased prescribing following regulatory changes
- Drug shortages leading to substitutions and work-flow disruptions
- System limitations in electronic prescribing and dispensing software
- Reliance on system defaults without adequate verification
- Incomplete communication among prescribers, pharmacists, and patients

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## SAFETY briefs

**Confused Drug Names–Finasteride and Fesoterodine.** A patient's home medication history collected and documented by a nurse several days prior to a scheduled orthopedic procedure included finasteride 1 mg with directions to take 8 mg daily. Finasteride is approved to treat alopecia and benign prostatic hyperplasia (BPH) in patients with significantly enlarged prostates. However, the patient did not have either condition. Instead, their medical history included an overactive bladder which was being treated with the medication fesoterodine (8 mg daily).

The error in the patient's medication history was not caught, and finasteride 8 mg was ordered to be continued after surgery. Thankfully, the pharmacist verifying the order recognized that this is a high dose for this drug. Typical dosing of finasteride for alopecia is 1 mg once daily, and for BPH it is 5 mg daily. The pharmacist then looked at the patient's prescription history and did not see that finasteride had been dispensed previously. They discovered that the patient had received fesoterodine 8 mg. The pharmacist contacted the patient who confirmed that they did not have a prescription which required them to take 8 tablets, but that they did take an 8 mg tablet for an overactive bladder, which aligns with the dosing and use of fesoterodine.

The names are similar, both starting with the letter "f" and containing a similar number of characters, many of which are the same. Both medications are also dosed daily and used to treat urological conditions. The reporter noted that staff more frequently encounter prescriptions for finasteride, so confirmation bias may have played a role in the error.

This report highlights the need and benefit of robust medication reconciliation processes. Discrepancies in medication histories and incomplete or inaccurate medication history collection and reconciliation are

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## Order Verification and Dispensing

- Clarify patient-specific dosing with the ordering provider when multiple strengths are active on the patient's profile.
- Double-check the strength, formulation, brand name, and manufacturer when filling estradiol patch prescriptions. If it is unclear which product is to be dispensed (e.g., the administration frequency does not match the product prescribed), clarify the prescription with the prescriber.
- Ensure prescriptions are properly flagged when manufacturer consistency is required.
- Explore differentiating the estradiol patch names in your pharmacy dispensing software. One organization shared that they modified the drug names to include the patch application frequency as well as "patch" as the dosage form (**Figure 1**). This change has made it easier for practitioners to identify which patch is intended to be used weekly or twice weekly.


**Figure 1.** One organization changed how the drug names for estradiol patches appear in their pharmacy dispensing software. The original view (left) did not include information regarding the frequency of application (i.e., once versus twice weekly). The modified view (right) includes the product's frequency of application and makes it clear that the product is a patch.

- Explore whether CDS can be employed to alert pharmacists when the entered frequency does not match what is indicated for the selected product.
- Use barcode scanning consistently during dispensing to verify the correct product and reduce selection errors.
- Verify product selection during each step of the workflow process.
- Consider utilizing auxiliary labels or system-generated warnings on manufacturer cartons to highlight key differences in dosing frequency (e.g., "Apply once weekly," "Apply twice weekly").

## Patient Education

- Consider marking prescriptions for estrogen patches for mandatory patient education.
- Engage patients to review the pharmacy labels and contents of each prescription carton to check that the medication is correct—even if this requires opening the bag.
- Educate patients to inform healthcare providers that they are using a transdermal patch, especially during transitions of care, as patches can be overlooked if not communicated.
- Instruct patients to remove their patch before an MRI procedure, since some patches may contain metal and cause skin burns.
- Educate patients on how often to apply their patch and what to expect from therapy.
- Reinforce the importance of reviewing directions with each refill, even for patients familiar with patch use.
- Counsel patients to avoid exposing patches to heat sources, such as heating pads and heated car seats, as this can increase drug absorption.
- Educate patients to check that the patch remains securely in place and to follow instructions if it falls off.
- Counsel patients to fold used patches so the adhesive sides stick together and dispose of them in household trash, keeping them out of reach of children and pets.

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common causes of errors, especially during transitions of care. Establish expectations for conducting medication history collection, verification, and reconciliation. Designate specific and appropriate individuals to complete each process step, including the medication history collection and reconciliation processes. Include scripting in your medication reconciliation processes to collect information about prescription medications, over-the-counter medications (including herbals and dietary supplements), and non-enteral medications (e.g., infusions, including parenteral nutrition, transdermal patches). Also, add prompts to ask patients about the purpose of each medication.

Alert staff to the risk of confusion between these drugs. Enhance clinical decision support (CDS) to provide both prescribers and pharmacists with robust indication-based and dose screening of prescriptions. Test the CDS periodically and ensure that the screening is providing appropriate alerts as needed. Prescribers should include the purpose of the medication on the prescription. When picking up their prescription(s) at the pharmacy, have the patient review the pharmacy label and contents of each prescription container to confirm that the medication is correct. This provides an opportunity for the patient and pharmacy staff to recognize an error if the wrong drug is being dispensed.

**Look-Alike Dicyclomine and Doxycycline Manufacturer Bottles.** A practitioner reported that bottles of dicyclomine 20 mg tablets and doxycycline 20 mg tablets, both manufactured by PD-Rx Pharmaceuticals, look identical (**Figure 1**, page 3). The labeling for both products uses the same font style and colors for the trade dress elements (i.e., green wave at the top of the container label and blue wave at the bottom of the container label). Also, the dosage strengths are presented in the same red color. While the quantity of tablets contained in each bottle is different (100 tablets of dicyclomine and 60 tablets of doxycycline), the bottles are the same size. The reporter also noted that the drug names look and sound similar and that the bottles may be stored near one another.

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- Encourage patients to speak up if something does not look right to help identify errors early.
- For more medication safety tips for patients using patches, please review and share the patch safety information on our consumer website consumermedsafety.org.

Thank you to those who shared the strategies you have implemented to prevent these types of errors. If you have other suggestions, please send a message to medicationsafety@ecri.org to continue the dialogue on this important issue.

# Dupixent Dispensing Quantity and Insurance Requirements

**Problem:** A specialty pharmacy contacted us regarding requirements from some insurance companies to dispense the exact number of **DUPIXENT** (dupilumab) prefilled syringe or pen devices needed to satisfy the patient's monthly prescription. Dupixent is approved for a number of indications in both adults and pediatric patients of varying age ranges, including atopic dermatitis, asthma, chronic rhinosinusitis with nasal polyps, eosinophilic esophagitis, chronic spontaneous urticaria, and allergic fungal rhinosinusitis. While the adult dosing is typically 300 mg (one pen or syringe) every two weeks, some pediatric patients (depending upon their body weight), may only receive a dose once every 4 weeks. To accommodate every two-week dosing, Sanofi, the manufacturer of Dupixent, packages the medication devices in cartons containing two devices each. However, this means that each carton contains more medication than is needed for some pediatric patients. For example, a pediatric patient between the ages of 6 months and 5 years who weighs 5 to less than 15 kg would receive 200 mg every 4 weeks for atopic dermatitis. Similarly, a patient in the same age range but weighing 15 to less than 30 kg would receive 300 mg every 4 weeks. Each of these dosing regimens requires the use of only one syringe or pen device per month.

This situation is similar to what we reported in our March 2019 article, Insulin Pen Dispensing and Pharmacy Storage of Open Cartons, about insulin pen cartons. At the time, a number of pharmacists contacted us regarding requirements from insurance companies to dispense the exact number of pen devices needed to satisfy the patient's prescription. Manufacturers package most insulin pen devices in cartons containing two to five pens; however, a patient's monthly dose may only require a subset of the pens in the carton. Historically, many pharmacies would dispense an entire carton of pens to a patient instead of dispensing just one or two pens.

There are risks with insurance companies mandating pharmacies to dispense only a single pen or syringe device. For example, Dupixent is light sensitive. In fact, the product's prescribing information directs practitioners to store the medication refrigerated in the original carton to protect it from light. Also, each carton contains only a single copy of the patient information sheet and instructions for use (IFU). The IFU provides critical step-by-step instructions on how to properly use the medication device. When each syringe or pen in a carton is dispensed to different patients, only one of the patients will receive the IFU.

**Safe Practice Recommendations:** We have discussed with the US Food and Drug Administration (FDA) the possibility of encouraging manufacturers to produce cartons that contain only a single device, which would ensure that each pen has the full product labeling and IFU. However, in the meantime, if a pharmacy must dispense single devices, consider having staff clearly and prominently indicate on the carton that it has been opened. Since Dupixent must be protected from light, consider using commercially available boxes/cartons or light protected bags, rather than a clear plastic bag, that can accommodate a pharmacy-generated label to package the single syringe or pen. Also, mark these prescriptions for mandatory counseling. We are interested in learning about whether you have faced similar issues from insurance companies and any strategies you may have employed to help safeguard the dispensing of the medication. Please email your comments and strategies to: medicationsafety@ecri.org.

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Dicyclomine is approved to treat irritable bowel syndrome–associated pain while doxycycline is an antibiotic. Dispensing doxycycline instead of dicyclomine to a patient with irritable bowel syndrome may result in increased gastrointestinal adverse effects. If dicyclomine is dispensed in error instead of doxycycline, the patient's infection will be untreated.

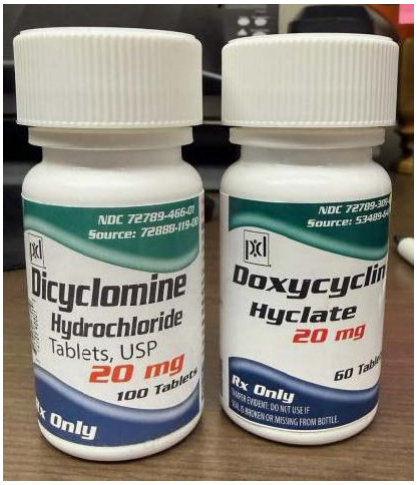


**Figure 1.** Look-alike bottles of dicyclomine 20 mg tablets (left) and doxycycline 20 mg tablets (right), both manufactured by PD-Rx Pharmaceuticals.

Alert staff to the potential for mix-ups. When possible, purchase products from different manufacturers to reduce the number of look-alike containers. If you currently have these products, consider storing them separately. Make sure staff are aware that they have been separated and where to locate the medications. Explore ways to differentiate the products to highlight critical information when they are received from the supplier. Employ barcode scanning during dispensing and verification.

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