

Transdermal patches: High risk for error?

✕ Although transdermal patches provide a useful alternative to oral medications, patch administration can be complicated. Transdermal patches are a common route of administration for hormonal therapy, narcotic analgesia, and nicotine. There are patches available for over-the-counter and prescription-only use.

Medication errors with patches occur in every healthcare practice setting—patients' homes, physician offices, intensive care units, cardiac step-down units, day care facilities, inpatient institutional settings, emergency departments, etc. Outcomes have been associated with patient harm, including death. The highest risk is with the narcotic analgesic patches because of the potential for respiratory depression associated with this class of medications.

Not all patches are equal

Like all medication errors, mistakes associated with transdermal patches are multifactorial. One common cause of error seems to be related to the patch designs, which have confused patients, caregivers, and practitioners.

The transdermal patch products available in this country vary in units of dosage-strength expression, frequency of administration, shape, size, color, and site of administration. Given all these factors and the complex healthcare environment, opportunities for errors abound.

Application, removal of patches

•*What is an overlay?* The overlay is the portion of the two-piece patch that secures the medicated patch to the skin of the patient. In the institutional setting, the overlay is sometimes returned to the pharmacy in the patient drawers when the medication cassettes are exchanged. This can be a clue to the pharmacy staff

that the patches are not being applied appropriately.

•*Why can't you tape it on?* The technology of most patches is designed to use the occlusive dressing to facilitate the absorption of the drug through the skin. Some patients do not realize that the patch must be applied directly to the skin. There was a report of a patient who applied his new patch directly on top of the old one. This continued until he had four patches stuck to one another instead of to his skin. In one case, a practitioner applied the overlay to the patient's skin and taped the medicated patch on top of the overlay patch.

Additionally, some patients do not realize they must remove the protective liner (usually a plastic/paper lining such as you see on an adhesive bandage) in order to expose the adhesive and medication to the skin for absorption. One report describes only partial removal of the backing, whereby a patient does not receive the proper amount of drug because the protective lining blocks the absorption.

Many patches have different instructions for *where* the patch is to be placed. Most patch directions suggest rotating the area of application to avoid skin irritation. For example, there are patches that are applied to the torso or trunk of the body between the neck and waistline; to the scrotal tissue; on the skin behind the ear or upper arm.

In the case of Testoderm patches, one type is to be applied to the scrotal tissue, while the other is not. Since both patches have the name Testo-

derm, there is potential for confusion, which may result in the patches being applied to the wrong area.

Errors have been reported wherein patients receive or apply multiple patches at once. One man did not survive after his wife applied six fentanyl patches to his skin at one time. Another common problem is that the old patch is not removed when the new patch is applied.

Clear patches have become popular because you cannot see them on the skin; however, this feature has also made them error-prone. Nitroglycerin and nicotine patches are available as clear patch formulations. These patches become problematic for practitioners and patients because they are difficult to find on the patient's skin when it is time to remove or replace them.

The risk for errors is increased when there are multiple caregivers, for example, when nurses change shifts or if multiple family members take turns helping patients with their medications. This arrangement can result in miscommunication, or lack of communication, about where and when the last patch was placed and the next one is due. It is also possible for a patient's transdermal patch therapy to go unnoticed by the staff as they transition between different levels of care in the healthcare environment.

Nomenclature issues

Various units of measure are used to express the dosage strength of transdermal patches. Some are expressed as mg/hour, mg/day, mcg/hr, or simply as milligrams. For patches that are changed weekly, you may see the dosage strength expressed as mg/day/week.

Another source of confusion is the use of obscure abbreviations as modifiers. What does TTS mean? TTS stands for Transdermal Therapeutic

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System, and some patches include this in the name of the product (for example, Catapres-TTS and Testoderm TTS). TTS has been read as an abbreviation for Tuesday, Thursday, Saturday, resulting in patch application on three days instead of once weekly.

Dosing intervals for patches

•*When do I change my patch?* Patches are changed daily, every three days, twice weekly, weekly, every three weeks, and so on. Confusion surrounding the frequency of patch administration presents another opportunity for error. And it seems that the longer the time between patch changes, the greater the risk for forgetting where the patch was placed or forgetting to remove the old patch.

Appropriate prescribing of patches

It is possible for prescribers to confuse the dosing interval, dosage strengths, and instructions for use among various patch formulations. An order for Catapres TTS was written in error as once daily instead of once weekly. Ironically, even after clarification of the dosing interval took place, an error still occurred because the practitioner applied only the overlay patch and not the medicated patch portion.

Many products are available in multiple dosage formulations, including a transdermal patch and oral or injectable forms. There is a potential for error when a patient is being switched from one form to another. Additionally, there is potential for patients to receive duplicate therapy with the same or similar medications. For example, it is possible for a patient to receive a nitroglycerin transdermal patch and oral isosorbide mononitrate, in error.

Pediatric patch issues

For the pediatric patient population, only small portions of transdermal patches may be needed. Although some patches can be cut for partial patch administration, cutting others destroys the release of the medication. It is recommended that pharmacists

dispense all patches to nurses intact, with instructions as appropriate.

Safe patch storage and disposal

Accidental and intentional ingestion of transdermal patches has been reported. Safe storage and disposal of transdermal patches are critical to preventing accidental poisoning of children and pets. Some patches come with a container for safe disposal. It may be safer to cut a used patch into pieces before disposing of it.

Strategies for error prevention

When possible, avoid prescribing, purchasing, or adding to the formula-ry any CLEAR patches.

To prevent duplication of therapy in the institutional setting, document the patch removal on the patient medication administration record (as if it

were its own order), as well as the application of each new patch. Documentation of patch administration should include site of application—critical if there are multiple caregivers involved in the patient care.

In the inpatient setting, monitor medication cassettes for return of overlay patches to pharmacy, and follow up on this issue with the practitioners caring for that patient to rule out improper patch application.

Monitor patients with two-piece patches to ensure they are receiving active drug. If the therapy seems to be ineffective, rule out improper patch application.

Patient education can help prevent patch-related medication errors.

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