

Patient Safety Tip of the Week

June 23, 2015

Again! Mistaking Antiseptic Solution for Radiographic Contrast

Most of us remember an unfortunate case a few years ago where a patient was inadvertently given intraarterially the antiseptic skin prep solution, chlorhexidine, instead of contrast media ([ISMP 2004](#)). That resulted in a leg amputation, followed by a stroke and multiple organ failure and, ultimately, death.

In that case there were two unlabeled basins containing clear solutions that looked alike. So it was not surprising that such accidents might occur. The Joint Commission now requires that all basins, syringes, and other containers in the sterile field be appropriately labeled. Moreover, when any such liquid is to be injected into a patient there should be a verification that the agent is the one intended for injection.

It has been several years since we've heard about such accidents. But now the National Health Service in England has just issued an alert following three incidents involving inadvertent injection of skin antiseptic solutions since 2012, and one additional near miss ([NHS 2015](#)). Two incidents involved severe harm from confusion between 2% chlorhexidine and x-ray contrast media in circumstances where both substances were in unlabeled basins. The near miss also involved confusion between chlorhexidine and x-ray contrast material despite the fact the two solutions were on different tables. The other incident involved flushing a renal dialysis line with chlorhexidine rather than saline. These cases occurred despite two previous alerts from the National Patient Safety Agency in the UK ([NPSA 2007](#), [NPSA 2010](#)).

Incidents involving injection of the wrong substance when two look-alike substances are in proximity and are unlabeled have occurred in multiple venues (angiography suites, cath labs, dialysis units, hospital OR's, ambulatory surgery centers, and others). Most hospitals have really focused on enforcing the "no unlabeled syringes" and "no unlabeled solutions in basins" in the OR. But it may be that those **other areas (radiology suites, cath labs, dialysis units, etc.) may be even more vulnerable to such incidents. And don't forget bedside procedures. They are probably even more prone to such mistakes.** Clear, colorless skin antiseptics might be easily confused with substances intended for spinal injection or injection into other body cavity.

There's always that tendency to think "I know what's in that basin" and "there will only be one basin". Then another basin shows up with a substance similar in appearance, often unbeknownst to the person who will actually be injecting.

There's also a tendency to keep the skin antiseptics around "just in case we might need them". Once you've prepped the skin, the antiseptic agent should be removed from the sterile field (and even adjacent stands). There is usually easy access to these in most venues if you really do need them again so there is little reason to "keep them around just in case you might need them again". And remember that the alcohol-based antiseptics are also flammable so you especially don't want them sitting around where they might get ignited by a heat source during a procedure.

Note that the switch in antiseptics from a brown povidone-iodine solution to a clear chlorhexidine solution likely played a role in some of these incidents, such as the one described in the 2004 ISMP alert.

The steps recommended by ISMP in that 2004 Alert ([ISMP 2004](#)) still bear repeating:

- Develop and implement policies and procedures for safe labeling of medications and solutions used in all settings where procedures might be done.
- Make labeling easy by purchasing sterile markers, blank labels, and preprinted labels prepared by the facility or commercially available that can be opened onto the sterile field during all procedures. (ISMP had also recommended preprinted labels for all anticipated medications and solutions for a case but we are always concerned that having multiple labels increases the risk the wrong label might be affixed to the wrong substance).
- Require labels on all medications, medication containers (e.g., syringes, medicine cups, basins), or other solutions on and off the sterile field, even if there is only one medication or solution involved
- Require labels on all solutions, chemicals, and reagents (e.g., formalin, saline, Lugol's solution, radiocontrast media, etc.) that are used in the units where procedures might be done.
- Differentiate look-alike products (eg. tall man lettering, highlight/circle the distinguishing information on the label, etc.) When possible, purchase skin antiseptic products in prepackaged swabs or sponges to clearly differentiate them from medications or other solutions and eliminate the risk of accidental injection.
- Label only one at a time.
- Verify all labels and medications/solutions. Verbally confirm the product name, strength and dosage form between the scrub person and circulating nurse and when passing it to the physician or person performing the procedure.
- Keep all original medication/solution containers in the room for reference until the procedure is concluded.
- Re-verify with relief staff. Shift changes, temporary or permanent, are vulnerable periods and the handoffs should include verification of all medications/substances and their labels on the sterile field.
- Discard unlabeled medications. Don't assume that you know what is contained in an unlabeled syringe, cup, or basin. Discard any unlabeled solution or medication

- found in the procedural area (including the sterile field) and report the event as a hazardous condition. Nothing should leave the hand unless it is labeled.
- Audit or do walk rounds in all areas doing procedures to ensure compliance with these policies and practices. You really need to risk assess injectable medicine procedures and products and practices in all clinical areas.
 - Stories, not statistics. Stories about tragic mixups remain one of the best ways to ingrain safety concerns in all staff.

To these we'd add:

- Once you've prepped the skin, the antiseptic agent should be removed from the sterile field (and even adjacent stands).
- Areas that use saline (or other substance) to "flush" lines or fill balloons might be especially at risk and the flushing substance needs to be carefully labeled and identified.
- If you supply blank sterile labels, make sure you supply a sterile pen so those labels can be appropriately labeled
- Pay careful attention to the risks not just in the OR but in other areas and don't forget bedside procedures may be vulnerable

Such tragic mixups involving accidental injection of skin antiseptic agents are, fortunately, rare. But you don't want one happening at your facility or to your patients.

References:

ISMP (Institute for Safe Medication Practices). Loud wake-up call: Unlabeled containers lead to patient's death. ISMP Medication Safety Alert! Acute Care Edition. December 2, 2004

<http://www.ismp.org/newsletters/acutecare/articles/20041202.asp>

NHS (National Health Service) England. Patient Safety Alert NHS/PSA/W/2015/005. Stage One: Warning. Risk of death or severe harm due to inadvertent injection of skin preparation solution. May 26, 2015

<http://www.england.nhs.uk/wp-content/uploads/2015/05/psa-skin-prep-solutions-may15.pdf>

National Patient Safety Agency. Promoting safer use of injectable medicines. Patient Safety Alert 20, 2007

<http://www.nrls.npsa.nhs.uk/resources/type/alerts/?entryid45=59812&q=0%C2%ACinjectable+medicine%C2%AC>

National Patient Safety Agency. Injectable medicines in theatres. Signal 1162, 2010;
<http://www.nrls.npsa.nhs.uk/resources/?entryid45=66753>

 The
Truax
Group
Healthcare Consulting
www.patientsafetysolutions.com

<http://www.patientsafetysolutions.com/>

[Home](#)

[Tip of the Week Archive](#)

[What's New in the Patient Safety World Archive](#)