

## Patient Safety Tip of the Week

August 27, 2019

### Double Check on Double Checks

One of our most popular columns has been our October 16, 2012 Patient Safety Tip of the Week [“What is the Evidence on Double Checks?”](#). In that column we pointed out the lack of high-quality studies addressing the efficacy of double checks, though we continue to recommend them in certain circumstances, with the caveat that they are not infallible.

Even though we have emphasized that double checks are a relatively weak intervention (we also know from other industries that the error rate when a supervisor checks someone else’s work may be 10% or higher), the literature suggests a medication error reduction of about 30% when using a double check system (see our July 15, 2008 Patient Safety Tip of the Week [“Heparin Flushes.....Again!”](#)). Also, for many high-risk medications you need to do truly independent double checks (see our March 30, 2010 Patient Safety Tip of the Week [“Publicly Released RCA’s: Everyone Learns from Them”](#) for a description of independent double checks). Another nice article on independent double checks in preventing medication errors ([ISMP Canada 2005](#)) describes the independent double check process and calculates that independent double checks would reduce the error rate of a process having an error rate of 5% all the way down to 1 in 400.

Our January 2010 What’s New in the Patient Safety World column [“ISMP Article on Double Checks”](#) highlighted an article [“Santa checks his list twice. Shouldn’t we?”](#) that puts the independent double check process in perspective. They cite some studies done in community pharmacies that show double checks found errors in 2.6% to 4.2% of cases, about half of which were potentially significant. And the “average” error checking rate is about 5%. But they also discuss how difficult it is for someone to pick up their own errors (because of phenomena such as confirmation bias) and point out that double checks work best when they are performed truly independently.

We’re now fortunate to have two timely articles on double checks within the past two months.

Koyama et al. ([Koyama 2019](#)) conducted a systematic review of studies evaluating evidence of the effectiveness of double checking to reduce medication administration errors. They identified thirteen studies but, of these, there were only two randomized controlled trials and one randomized trial in a simulated setting. The other 10 studies

used an observational study design. Among three good quality studies, only one showed a significant association between double checking and a reduction in medication administration errors, another showed no association, and the third study reported only adherence rates. Also, it should be noted that no studies investigated changes in medication-related harm associated with double checking. They conclude that there is insufficient evidence that double versus single checking of medication administration is associated with lower rates of medication administration errors or reduced harm. They call for higher-quality studies to determine if, and in what context (eg, drug type, setting), double checking produces sufficient benefits in patient safety to warrant the considerable resources required.

On the other hand, ISMP ([ISMP 2019](#)) published a very practical article on double checks. Though it notes the paucity of high-quality evidence on double checks, it summarizes findings from many of the observational studies that have demonstrated a benefit from correctly performed double checks. ISMP remains an advocate of truly independent double checks in special circumstances. Notably, it does **not** recommend them for all high alert medications. It cites the time-consuming nature of independent double checks as a downside.

ISMP suggests your decision about which processes should require an independent double check should be based upon analysis of 4 key considerations:

1. Processes and medications that pose the greatest risk of harm if an error occurs (e.g., intravenous [IV]/epidural opioids, IV insulin, IV heparin, IV chemotherapy)
2. The primary reason for the independent double check (what you are trying to catch) and what specifically needs to be verified to achieve that goal
3. Whether an independent double check is the best strategy to detect a specific risk or prevent a specific error
4. How the independent double check fits in with other risk-reduction strategies that might address the same or a similar safety concern

ISMP notes you might use findings from hazard and event analysis, or a FMEA (Failure mode and effects analysis) to help inform your decisions about what processes should require double checks. We've noted in our several columns on accidents with NMBA's (neuromuscular blocking agents) that, if you store these in an automated dispensing cabinet, you need a way of verifying that the patient is intubated and ventilated (or that the NMBA is being used to facilitate intubation and ventilation) before dispensing the NMBA from the ADC. But we've also recommended that a second qualified healthcare professional verify that dispensing of the NMBA from the ADC is correct. But you need to be wary that the second person is truly acting independently and not simply "signing off" complacently. How many times have you seen a transfusion reaction occur after two individuals supposedly "verified" the unit of blood was correct for that patient?

ISMP notes that bedside barcode verification may be more reliable than double checks for getting the correct patient, medication, and dose. But that independent double check at the bedside may be a better strategy for avoiding infusion pump programming errors and line confusion errors.

ISMP has always stressed that the double check needs to be a truly **independent** double check. That means that two qualified healthcare professionals need to assess the question(s) separately and only compare their conclusions after each has completed their assessments.

Both the ISMP and Koyama articles point out the considerable variation and often a lack of clarity about how the double check should be performed. They also note it is possible that double checking is never truly independent in real-world settings regardless of how the double-checking process is defined. For example, if the checker is “primed” in any way (as opposed to truly independent double checks), an error may not be detected due to confirmation bias.

ISMP reiterates the several themes from Armitage ([Armitage 2008](#)) that we discussed in our October 16, 2012 Patient Safety Tip of the Week “[What is the Evidence on Double Checks?](#)” that can lead to errors in the double checking process. These include:

- Deference to authority
- Reduction or diffusion of responsibility
- Distractions and interruptions
- Auto-processing
- Lack of time

ISMP adds another contributing factor: “**satisficing**” (failure to look for and process additional information once initial information looks correct).

**Deference to authority** occurs when the individual being asked to perform the double check perceives the first checker to be above them in the “hierarchy”. Note that sometimes it was the other person’s formal title or status that put them “above” in the hierarchy. For example, it could be the new hire double checking the work of an experienced worker. But at other times it was a perceived skill, often their ability to perform mathematical calculations rapidly, that put them in a position of authority!

**Reduction or diffusion of responsibility** refers to the complacency that tends to occur when someone feels that someone else will catch any mistakes that they made. We’ll actually take that a step further and note that we all have a tendency in the information age to think that “the computer says it’s ok so it must be ok”.

**Distractions and interruptions** might include social interactions and unrelated conversations that often interfere with the double checking process. The latter reminds us to use “**the sterile cockpit**” aviation concept, in which no extraneous conversation is allowed to occur during high risk activities such as takeoff and landing.

**Auto-processing.** An example of this might involve two people standing together with one reading item by item and the other simply nodding assent to each.

**Lack of time** is self-explanatory. But it also serves as a reminder that, because the independent double check process is time-consuming, we need to use it only in those circumstances where it is most important.

In our October 16, 2012 Patient Safety Tip of the Week “[What is the Evidence on Double Checks?](#)” we mentioned use of **checklists** to help with the double check process. Indeed, checklists have been used successfully in the double checking process but there is a science to developing such checklists ([White 2010](#)). White and colleagues looked at the independent double checking process for administering outpatient chemotherapy medications. They used a very realistic simulation environment to observe nurses administering chemotherapy using two different checklists. While use of the two checklists did not differ significantly in detection of pump programming errors, there was a significant difference in the ability to detect other types of errors. They found that using very specific items, rather than more general warnings, significantly improved certain error types. For example, more errors occurred with a checklist that simply told them to check the medication label against the original order than with a checklist that specified the exact elements to check on the label and the order. Also, **a general reminder** to “think critically” and “remember the 5 rights” **had virtually no impact**. (We love the concept in John Nance’s book mentioned in our June 2, 2009 Patient Safety Tip of the Week “[Why Hospitals Should Fly...John Nance Nails It!](#)” where everyone always asks themselves “Could what I’m about to do cause harm to this patient?” but this article by White et al. would suggest that won’t actually have much of an impact). White et al. conclude that for independent double checking the most important factor is completion by the second individual of a well-designed checklist with **specific items for each high-risk error**. They provide a nice table of 7 important steps in developing such checklists.

The current ISMP article provides some good examples of questions that can be used in templates for double checks in some specific scenarios.

A very important point in the ISMP article is the need for **standardization**. It suggests that, to reduce inconsistencies, we should always establish a standard process for carrying out an independent double check and educate staff about its importance and how to carry it out properly. We must emphasize that it is not a superficial routine task or just a “cosigning” requirement. Rather, it is a significant independent cognitive task.

Finally, ISMP reminds us to avoid sole reliance on independent double checks.

We’d also like to point out the demise of another form of double check, **the “mental” double check**, in the era of computerized medicine. When we talk about double checks, we are usually talking about two separate individuals independently checking something. The mental double check may simply involve one person employing a separate cognitive process to double check. Or, it may be a nurse or pharmacist doing a quick mental double check of an order from a physician. In the “old days”, when a nurse looked at an order for a medication, he/she would do a quick mental calculation of the ordered dose and decide if the result fell into a reasonable range. In the era of CPOE and e-prescribing, it’s often

assumed that whatever the computer says is correct and the step of “mental double checking” seems to be a lost art.

**Some of our other columns on double checks:**

January 2010	<a href="#">“ISMP Article on Double Checks”</a>
October 26, 2010	<a href="#">“Confirming Medications During Anesthesia”</a>
October 16, 2012	<a href="#">“What is the Evidence on Double Checks?”</a>
December 9, 2014	<a href="#">“More Trouble with NMBA’s”</a>
April 19, 2016	<a href="#">“Independent Double Checks and Oral Chemotherapy”</a>
December 11, 2018	<a href="#">“Another NMBA Accident”</a>
March 5, 2019	<a href="#">“Infusion Pump Problems”</a>

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