

Label design may affect risk of medication errors in OR

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Special redesigned labels for intravenous (IV) medication bags may help to prevent serious medication errors in the operating room, reports a study in the March issue of the *Journal of Patient Safety*. The journal is published by Wolters Kluwer.

Based on trainee behaviors during OR simulations, "The results of this study provide additional evidence to support the use of opaque, white medication labels and the use of inverted text for highlighting key medication information on the label," writes Jamie L. Estock, MA, of the VA Pittsburgh Healthcare System and colleagues.

Simulations Assess Impact of Medication Labels Designed for Safety

The researchers performed a study to explore how one recommended label design for IV medication bags might affect the risk of giving the wrong drug during an OR emergency. In the study, 96 anesthesia trainees (anesthesiologists or nurse-anesthetists) were randomly assigned to participate in simulations of a "realistic, high-stress, clinical situation" using standard or redesigned medication labels.

The redesigned labels were opaque, white, two-sided labels, with "inverted text"—in this case, white letters on a dark background—highlighting key medication information. The standard labels were printed only on one side of the clear medication bags, with

smaller text and a more cluttered appearance.

The experiment used a simulated crisis, in which the surgeon called for emergency administration of a volume expander (hetastarch) to a patient in unstable condition. Participating trainees had to quickly select the correct medication from their anesthesia cart.

However, the carts were "incorrectly stocked," with a bag of local anesthetic (lidocaine) placed where hetastarch should have been. This scenario was prompted by a "close call" involving an IV bag of lidocaine that could have been substituted for a bag of hetastarch due to lookalike packaging. The trainees' responses were videotaped to see if the redesigned labels would help them correctly select hetastarch from the anesthesia cart.

Redesigned Labels Reduce the Rate of Medication 'Errors'

"The percentage of participants who correctly selected hetastarch from the cart was significantly higher for the redesigned labels than the current labels," Ms Estock and coauthors write. More than 60 percent of trainees correctly chose the hetastarch bag when the redesigned labels were used, compared to about 40 percent with the standard labels. On statistical analysis, the odds of selecting the correct medication were more than twice as high with the redesigned labels.

All of the participants who selected hetastarch from the cart went on to administer hetastarch. Thus, "[T]he redesigned label prevented some potentially catastrophic errors from reaching the simulated patient," Ms Estock and colleagues conclude.

Medication labels are just one of many factors that can contribute to

[medication errors](#) in complex health care environments. Although [medication safety](#) organizations have suggested labeling changes with the goal of reducing error risk, there is little evidence showing that the redesigned [labels](#) will improve medication safety in real clinical practice settings.

The new results provide a new piece of evidence that one specific label design for IV bags can reduce the risk of medication errors. The researchers emphasize that their study was in simulation—likely with a higher rate of errors than in the "real world." Ms Estock and colleagues call for further studies to evaluate recommended label redesigns, with adoption of those designs that show "a measurable improvement on medication safety."

More information: "Label Design Affects Medication Safety in an Operating Room Crisis: A Controlled Simulation Study." [DOI: 10.1097/PTS.000000000000176](#)

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