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Acute Care
ISMP Medication Safety Alert!®
Educating the Healthcare Community About Safe Medication Practices

During the *pandemic*, aspire to identify and prevent medication errors and to avoid blaming attitudes

We recently spoke to a hospital nurse working in a location where the coronavirus (COVID-19) has again surged with a vengeance, causing a significant increase in patient admissions to the intensive care unit (ICU) and frequent, tragic fatalities. He was particularly concerned about the many opportunities for serious medication errors when providing what he called "pandemic nursing" care—the rushed, physically overwhelming, and emotionally draining care provided to an onslaught of critically ill patients. He acknowledged that serious medication errors were happening frequently at his hospital and was worried that frequent errors were occurring in other hospitals as well when attempting to handle another wave of COVID-19 patients. The nurse also was concerned that healthcare providers in his hospital are, once again, resorting to finger pointing and blaming nurses when medication errors happen. Overall, the nurse felt that few medication errors involving COVID-19 patients were being reported, given a significant and understandable lack of time, as well as a fear of retribution.

Environment of "pandemic nursing"

The nurse works in a busy ICU treating about 20 COVID-19 patients daily, most of whom have multiple intravenous (IV) high-alert medication infusions (e.g., fenta**NYL**, propofol, norepinephrine, cisatracurium) administered via smart infusion pumps located inside their rooms. Due to staffing shortages, each nurse has a taxing workload and is typically assigned three patients—two seriously ill, ventilated patients and one recovering patient. Nurses are constantly vigilant with infection control procedures and wear the usual personal protective equipment (PPE) (gown, mask, gloves) throughout their shift. They can only change gloves between patient encounters due to PPE shortages. By the end of each shift, nurses are exhausted and overwhelmed, and sweating profusely under the PPE.

Nurses typically spend several hours in a patient's isolation room and often bring in as many medications, infusions, and supplies as they think might be needed during this time. Any unused infusions and supplies are left in the patient's room, stored in drawers and closets, before the nurse leaves. If nurses realize they have not brought a necessary medication infusion into the patient's room, they search the drawers and closets for stashed supplies because there may not be anyone available outside the room to bring them the needed infusion. Also, when they are in a patient's room, nurses cannot hear if a smart pump is alarming in another assigned patient's room, often resulting in pumps alarming without a timely response. If a nurse outside a room happens to hear a smart pump alarm, they will typically enter the room and reprogram the pump and/or hang a new infusion if needed, looking for the medication in the patient's drawers and closets. Some nurses will also leave extra infusions at the bedside so they can be spiked and hung by any nurse entering the room.

Occasionally, a "resource" nurse is available to assist in the ICU. However, too often, the "resource" nurse is tasked with auditing activities to ensure proper nursing documentation rather than assisting with clinical patient care. Subsequently, nurses have been reprimanded for documentation failures and urged to document care they were unable to provide.

continued on page 2 — Avoid blaming >

SAFETY briefs

HIGH-ALERT

Label improvement for Myxredlin. We were pleased to see a revised container label for Baxter International's **MYXREDLIN** (insulin human, 100 units per 100 mL [1 unit per mL]) product. Previously, the bag size and black and white label looked too similar to other Baxter minibags, and the product's generic name, insulin human, was not highly visible on the label. We commented on the need for Baxter to improve Myxredlin container labeling in our October 10, 2019 newsletter, calling for better visualization of "Insulin" on the product container label. Also, in our November 7, 2019 issue, we described an incident reported to the ISMP National Medication Errors Reporting Program (ISMP MERP) in which a patient received Myxredlin during surgery instead of a minibag of ce**FAZ**olin.

The revised label is a significant improvement (**Figure 1**). The principal display panel states "Insulin Human" in a red color band, and the font is about the same size as the brand name (federal regulations require that the nonproprietary name only be at least one-half of the font size used for the brand name). Also, the company includes a label on the back of the bag, which we previously recommended for pharmacists to add prior to dispensing the product. The

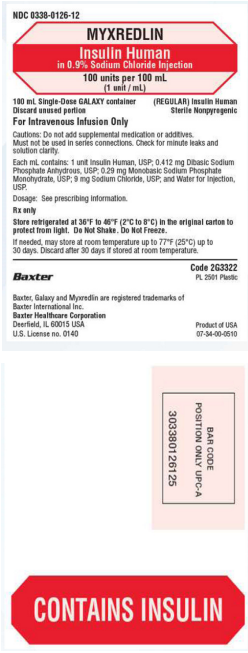

Figure 1. New and improved Myxredlin container labels, front (top) and back (bottom).

continued on page 2 — SAFETY briefs >

> Avoid blaming — continued from page 1

According to the nurse, a perfect storm for serious medication errors in the ICU is created in his hospital by:

- The hectic pace and disorganization of "pandemic nursing"
- The constantly under-resourced healthcare environment
- High nurse-to-patient ratios due to staffing shortages
- The exhausting and continuous donning of PPE
- The criticality of patients who require multiple high-alert medication infusions
- The stashes of medication infusions located in patients' drawers and closets
- The inability for timely response to smart pump alarms
- The need for any available nurse, not necessarily the assigned nurse who is familiar with the patient, to manage critical infusions

The errors

Most of the medication errors described by the nurse occurred after retrieving the wrong concentration of an infusion from stashes left in patients' rooms. Multiple concentrations of a drug may be available for one patient in response to required fluid restrictions due to renal and/or heart failure. Programming errors, titration errors, and mix-ups among the numerous infusions also occurred frequently. A few examples follow.

This hospital was utilizing two concentrations of fenta**NYL** infusions—the usual 10 mcg/mL concentration and a concentrated strength of 50 mcg/mL for fluid-restricted patients. Numerous errors occurred when the wrong concentration of fenta**NYL** was hung, which was often the result of administering a fenta**NYL** infusion bag left in a drawer or closet in the patient's room. Sometimes, the wrong concentration was selected when programming the smart pump. The nurse also mentioned that there were frequent errors associated with either prescribing and/or programming fenta**NYL** infusions in mg/hour instead of the intended mcg/kg/hour. Because bedside barcode scanning technology was not available in the ICU, and the smart pump drug library (dose error-reduction system) was often not engaged, these errors were not detected and corrected.

Similarly, the hospital utilized two concentrations of norepinephrine infusions, with the more concentrated infusion for fluid-restricted patients. Again, numerous errors occurred when the wrong concentration of norepinephrine was found in a drawer or closet and was administered, or the wrong concentration was selected during pump programming.

The nurse also described titration errors. In one case, norepinephrine had been prescribed for titration to manage significant hypotension in a ventilated, critically ill COVID-19 patient. When the patient's blood pressure dropped quickly, a physician at the bedside asked the nurse to progressively titrate up the norepinephrine. As they watched helplessly, significant hypotension worsened despite repeated upward titrations of norepinephrine. The patient continued to spiral downward, with no response to the norepinephrine titration, and subsequently died. It was then discovered that the nurse had actually been titrating a fenta**NYL** infusion instead of the norepinephrine infusion. It appears that fenta**NYL** had been administered via a smart pump programmed for norepinephrine, and norepinephrine had been administered via a smart pump programmed for fenta**NYL**.

The blaming cycle

The nurse we spoke with confided that, when a medication error happens in his hospital, there is usually gossip about the event, along with speculation regarding who was involved in the error given that many different nurses may have entered a patient's room to respond to an alarm, hang an infusion, or reprogram a smart pump. Managers and other leaders are concerned about the frequency of medication errors and frustrated about their inability to do anything about it; thus, they have resorted to blaming those

continued on page 3 — Avoid blaming >

> SAFETY briefs

cont'd from page 1

label on the reverse side now notes, "CONTAINS INSULIN." This improves visibility of the insulin content compared to the previous label. Similar changes have been applied to the Myxredlin outer carton label.

HIGH-ALERT

That's 15, not 50. A medical resident ordered 50 units of insulin glargine for a pediatric patient with diabetic ketoacidosis after discussing the patient's treatment plan with an endocrinologist. Normally, maximum doses are set at 0.5 units per kg at this hospital, and this child weighed 48 kg. A pharmacist confirmed the high dose with the resident. Later, the pharmacist saw the resident, who happened to mention that the consulting endocrinologist seemed tired when they spoke. The pharmacist then checked the endocrinologist's note in the patient's electronic health record (EHR), which mentioned a plan to possibly start insulin glargine 20 units. The pharmacist asked the resident to again verify the dose with the endocrinologist, who said he had actually ordered 15 units, not 50 units, during the phone consultation with the resident.

When oral communications are necessary, the receiver might misunderstand the information being communicated. Wearing a mask and/or face shield during the COVID-19 pandemic can further muffle sounds, which adds to the risk of mishearing. When safe to do so, remove the mask and/or face shield when speaking by phone. For medication doses in the teens, state the dose the way pilots state numbers—for example, "15 units" should be stated as "one-five units." Other double-digit doses (e.g., 30, 40, 50, 60, 70, 80, 90) may also benefit from stating each digit separately. Always follow through with readback, where the listener documents what is heard, then reads it back to the speaker, assuring that the order was heard and transcribed correctly.

Prevent potential hydrALAZINE—hydrOXYzine mix-ups. When putting away an order, a technician noticed nearly identical cartons of unit dose 50 mg tablets of hydr**ALAZINE** and hydr**OXY**zine from Major Pharmaceuticals (**Figure 1**, page 3). While the drug names on the carton labels incorporate tall man lettering, the rest of the letters in the drug names and formulations (i.e., hydrochloride tablets) are pre-

continued on page 3 — SAFETY briefs >

> Avoid blaming — continued from page 2

at the sharp end of the error—nurses in general if the individual nurse involved is unknown. In turn, nurses feel targeted, isolated, frustrated, and fearful of being fired; however, they are also concerned about the frequency of medication errors and feel unsupported by leaders in minimizing the risk of errors. Their suggestions for improvement seem to fall on deaf ears, and therefore they blame managers and leaders for their inability to prevent medication errors. Thus, the blaming cycle comes back full circle.

Nurses and other healthcare professionals have also joined in the blaming and shaming of the public for not taking the pandemic seriously and not following scientific recommendations to wear masks in public and maintain social distancing. They are angry at the anti-maskers and resentful of members of the public who wear masks under their chins or attend large gatherings without the necessary precautions.

Recommendations

COVID-19 is proving to be a long, uphill battle, with an end that is barely visible on the horizon. Thus, it is critical for healthcare leaders to plan for recurring waves of this pandemic. During a pandemic surge, all healthcare workers, including nurses and leaders, will face unimaginable anxiety and stress caused by the burden of this pandemic. Of course, no one wants to contribute to needless patient suffering and potential harm. We all need to aspire to identify and prevent errors and to avoid blaming attitudes when medication errors happen—and they will!

Identifying errors during the pandemic. During a pandemic surge, hospital leaders and managers should anticipate medication errors given the altered workflow and hectic environment, and should make it easy and safe for practitioners to report errors. To promote error reporting under the best of circumstances, leaders and managers must be trustworthy and credible, and the reporting system must be confidential, clear, and easy to use, as well as useful. During the pandemic, those who receive and act on error reports must understand that the probability of human error is significantly increased given the many adverse performance shaping factors that impact workers. They must earn and maintain the trust of reporters and prove that reporting is safe, allaying all fears of blame and punishment. They must also pay attention to the format and length of the required report, and provide rapid, useful, and understandable feedback to reporters, keeping them informed about how their reports are being used to improve systems and processes. Few things impede reporting more than perceived inaction and failure to use the information contained in a report to improve safety. During the pandemic, it is advisable to create a streamlined reporting process and build informal reporting pathways that promote communication and feedback, such as daily safety huddles.

Preventing errors during the pandemic. While time is a very precious commodity during a pandemic surge, certain steps can be taken to minimize the risk of a medication error once it has been reported and analyzed. For example, in the case of the hospital described above and the associated medication errors, the following steps could be taken, even during a surge, to minimize the risk of concentration errors, programming errors, titration errors, and other mix-ups among IV infusions:

- Standardize to a single concentration of IV high-alert medication infusions whenever possible, taking into consideration the need for fluid restriction in COVID-19 patients
- Standardize the dose-rate (mcg/kg/hour vs. mg/hour) for certain IV infusions, ensure that only these standard dose-rates are available as a choice in smart pump drug libraries, and require the use of standardized order sets that are in alignment with the standardized dose-rates when prescribing the infusions
- For common infusions, use premixed, commercially available solutions that are visually distinct from each other (i.e., do not look alike), whenever possible
- In the pharmacy, affix bold auxiliary labels to critical care infusions when dispensing

continued on page 4 — Avoid blaming >

> SAFETY briefs cont'd from page 2

sented in all uppercase letters, lessening the desired impact of the tall man letters. The prominence of "hydrochloride" in uppercase letters, listed on a separate line and spelled out rather than as HCl on the same line as the drug name, draws attention away from the drug name and adds to the similarity. The 50 mg strength is displayed on boxes using the same background and format. The technician confirmed each product before placing it in storage, but the risk of a mix-up is great.

One of the most frequent generic name pair mix-ups is with hydr**OXY**zine and hydr**ALAZINE**. With alphabetically similar names, the products are often stored next

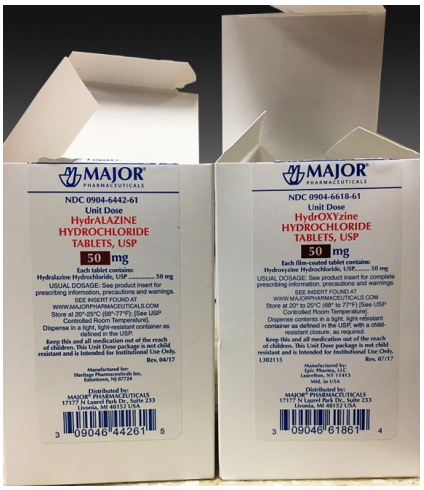

Figure 1. Look-alike packaging of hydr**ALAZINE** and hydr**OXY**zine from Major Pharmaceuticals.

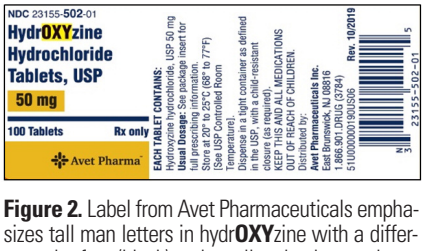

Figure 2. Label from Avet Pharmaceuticals emphasizes tall man letters in hydr**OXY**zine with a different color font (black) and a yellow background.

to one another on pharmacy shelves. Similar dosage strengths (10, 25, 50, 100 mg), tablet formulation, and adjacent presentation in drop-down menus and picklists also contribute to mix-ups.

Different design strategies are needed to make the tall man letters stand out. For example, Heritage Pharmaceuticals, doing business as Avet Pharmaceuticals, emphasizes the tall man letters in hydr**OXY**zine using a different color font (black) and a yellow background (**Figure 2**).

continued on page 4 — SAFETY briefs >

> Avoid blaming — continued from page 3

a nonstandard concentration or a neuromuscular blocking agent (e.g., **Warning: Paralyzing Agent, Patient Must Be Ventilated**) to reduce the risk of mix-ups
- Label all IV lines between the smart pump and source container, and close to the access into the patient's body; trace the line from the source container to the smart pump, and to the patient prior to hanging a new source container or programming a pump
- Establish a process for conducting independent double checks prior to administration of certain critical infusions
- Conduct daily safety huddles with physicians, pharmacists, and nurses
- When possible, schedule a "resource" nurse in the ICU with a light patient assignment to decrease the nurse-patient ratio and to help the team with other clinical activities

Plans should also be made to implement strategies that require more significant resources between waves of the pandemic, including:

- Implement bedside barcode scanning technology in the ICU and plan a procedure for its use in isolation rooms
- Increase and monitor compliance with engaging the smart pump drug library
- Implement smart pump interoperability with the electronic health record (EHR)
- Consider (and plan) the feasibility of locating smart pumps in hallways to facilitate timely management of pump alarms, infusion bag changes, and to prevent stashes of medications in COVID-19 patient rooms (please see our April 3, 2020 newsletter article, *Clinical experiences keeping infusion pumps outside the room for COVID-19 patients,* for details on how to implement: www.ismp.org/node/15327)

Avoiding blaming attitudes during the pandemic. ISMP believes everyone should follow the safeguards recommended by the Centers for Disease Control and Prevention (CDC) to prevent the spread of COVID-19 infection and to avoid endangering the lives of others. And, yes, we might respectfully coach others around us who may not be following these safeguards. Nonetheless, the vitriol hurled towards the public from both sides—by anti-maskers towards those wearing masks, or by those following CDC guidelines towards those not wearing masks or not practicing social distancing—is spreading discord during an already distressing time. This growing culture of blame and shame has had tragic consequences (e.g., violence, injuries from physical altercations, suicide from online shaming) and has done little to effect change. Perhaps this public finger pointing during the pandemic has contributed to the recurrent cycle of blaming and shaming in healthcare in the wake of an error?

Why is finger pointing happening during the pandemic? COVID-19 is an unseen, unpredictable, unknown, and horrific adversary. Because we feel powerless, it is natural to look to where we can find some sense of power, even if it is simply pointing the finger of blame at another. However, healthcare leaders and workers should not regress to the seductive powers of blaming and shaming so they can feel as though they are "doing something" about the problem. Blaming and shaming is neither a noble nor productive way to reduce errors—the opposite is true, as we have abundantly learned in healthcare.

Instead, leaders and managers should set a good example and support workers through the turmoil of the pandemic. First and foremost, workers need to know that their leaders and managers have their backs during the pandemic. Leaders and managers need to be effective listeners and transparent communicators, make collective decisions that support workers' needs and safety, and visibly demonstrate their trust, respect, and appreciation for the workforce. They also need to make it very clear that blaming and shaming is not acceptable—for leaders, managers, and healthcare workers alike—particularly in the wake of an error. Please see our May 1, 2020 newsletter article, *Leadership support is vital: If we fail to support caregivers, there will be few left to support care*, for additional recommendations to support the workforce during the pandemic: www.ismp.org/node/17459.

> SAFETY briefs cont'd from page 3

For now, employ barcode scanning when these products are received and stored in your pharmacy to help prevent mix-ups. Consider distinguishing the unique characters in each name by circling them with a pen, or purchase one of these products from a different manufacturer, to further differentiate their appearance.

Special Announcement

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- **September 15:** ***Enhancing Your Medication Error Reporting Program to Improve Global Medication Safety***
- **October 14:** ***Human Factors and Medication Errors***

On **September 15**, an international audience will learn how to improve practitioner reporting and apply ISMP's system-based approach to error analysis. To register, please visit: www.ismp.org/node/19035.

On **October 14**, we will explore human cognition and the cognitive tendencies and biases that contribute to medication errors, along with human-centered system design strategies that can prevent medication errors. To register, please visit: www.ismp.org/node/19915.

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