

Acute Care

ISMP Medication Safety Alert!®

Educating the Healthcare Community About Safe Medication Practices

COVID-19-related medication errors



In our April 9, 2020 newsletter (www.ismp.org/node/15489), we shared an idea to add a question, “Is this event related to COVID-19 (coronavirus)?” to reporting systems to categorize COVID-19-related events, allow rapid analysis of quickly emerging risks, and reduce leadership’s reaction time in knowing about and addressing some of these issues. Since then, we have received several COVID-19-related medication errors each week and wanted to update you on a few important issues.

Remdesivir investigational drug labeling confusion

ISMP received a report last week about a hospital compounding issue due in part to label confusion with the investigational drug remdesivir. Some facilities have received this drug, manufactured by Gilead Sciences, under a compassionate use program during a period of expanded access and through an emergency use authorization (EUA) program issued by the US Food and Drug Administration (FDA). The hospital had implemented an investigational study using intravenous (IV) doses of remdesivir to treat patients with severe COVID-19. The adult protocol called for an initial loading dose of 200 mg, followed by subsequent 100 mg doses. Each vial of remdesivir contains a total of 100 mg. Instead of using 1 vial to prepare each 100 mg subsequent dose, 2 vials were used, thus providing 200 mg for each subsequent dose instead of the intended 100 mg.

Remdesivir is available for use in clinical trials in at least two different dosage forms: a lyophilized powder for injection and a solution for injection. Like many investigational drug container labels, the vials are not clearly labeled, and the information presented is crowded and in a small font (see our 2-part article about problems with investigational drug labeling: www.ismp.org/node/1048; www.ismp.org/node/1068). The vials of lyophilized powder have a label listing the total amount (100 mg) of drug in the vial (**Figure 1**). The vials of remdesivir injectable solution have a label that lists the per mL strength, “Remdesivir (GS-5734) Injection, 5 mg/mL” (**Figure 2**). Below the 5 mg/mL listing, the vial label notes the total volume in the vial, “Contents: 21.2 mL,” which may

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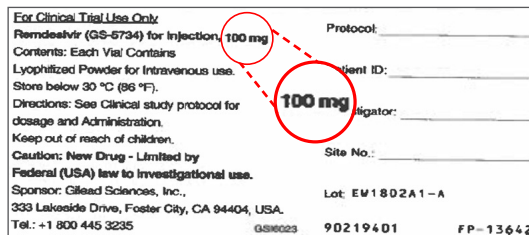


Figure 1. Label on vial of remdesivir lyophilized powder notes that it contains 100 mg.

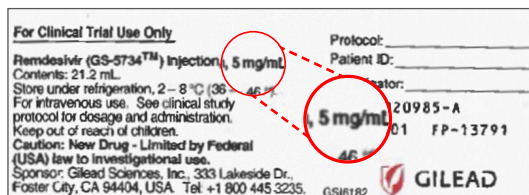


Figure 2. Label on vial of remdesivir injectable solution does not indicate the total amount (100 mg) of drug in each vial; instead, it lists a per mL amount (5 mg/mL) and below that, the total contents of the vial, 21.2 mL, which can be easily missed.

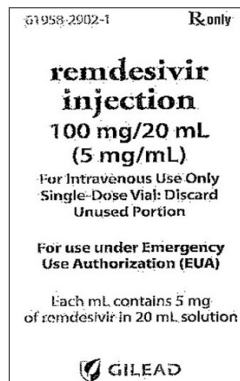


Figure 3. Another label from remdesivir injectable solution, which prominently lists the total amount of drug in each vial (100 mg/20 mL), with the per mL amount (5 mg/mL) in parentheses below it.

COVID-19 Collaboration

⚡ Double concentration (2%) propofol product becoming available

Fresenius Kabi received an emergency use authorization (EUA) on May 8, 2020, from the US Food and Drug Administration (FDA) to allow US marketing of **PROPOVEN 2%** (propofol 20 mg/mL) emulsion in 100 mL vials (www.ismp.org/ext/478). Propoven 2%, which is not approved in the US, contains the same active ingredient as FDA-approved **DIPRIVAN**; however, Propoven 2% contains double the propofol concentration (20 mg/mL) of Diprivan, which is a 1% (10 mg/mL) emulsion. The scope of the FDA EUA for Propoven 2% is limited to maintaining sedation via continuous infusion in patients 16 years and older who require mechanical ventilation in an intensive care unit (ICU) during the COVID-19 pandemic. Propoven 2% is expected to be available by mid-June. This will help address the unprecedented demand for propofol used to treat hospitalized patients with COVID-19, particularly given pending propofol shortages.

There is an obvious concern with Propoven 2% given its double concentration. Use of the product may lead to overdoses if practitioners are unaware of the different concentration. Propoven 2% should be carefully reviewed by an interdisciplinary committee including pharmacy, nursing, medical, anesthesia, critical care, and ambulatory care representatives. Prior to use, all critical care prescribers (including those redeployed to COVID-19 critical care units), nurses working in critical care units, and anesthesia providers should be alerted to the double concentration. Fresenius Kabi will be providing stickers that warn about the 2% concentration, which should be applied immediately upon receipt of the product in the pharmacy so that each

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be easy to miss. Another label presentation is available for the remdesivir injectable solution, which lists the total dose per total volume first (100 mg/20 mL), with the per mL amount (5 mg/mL) in parentheses below it, as per USP <7> (**Figure 3**, page 1). The hospital where the error happened only had remdesivir with the first two label presentations in stock (**Figures 1 and 2**, page 1); pharmacy staff were using the remdesivir injectable solution (**Figure 2**, page 1) when the error occurred.

The hospital identified that at least two factors contributed to the compounding error. First, there was initial confusion with the labeling of the injectable solution vial, which does not include the total dose (100 mg) contained in the vial (**Figure 2**, page 1). Second, confirmation bias played a significant role in the error. The technician inadvertently used 2 vials to prepare each subsequent remdesivir dose, exactly as he had just done minutes before when preparing several loading doses. A pharmacist failed to catch the error during the checking process (there was no barcode available to scan on the vials), and the erroneous 200 mg doses (which were labeled as 100 mg doses) were administered to multiple patients that day. No adverse reactions have been reported at this point. Reconciliation in the pharmacy at the end of the day for all remaining remdesivir vials, which was performed similar to a narcotic inventory reconciliation, led to identification of the error.

To prevent errors, consider adding a printed barcode label to each remdesivir container so barcode scanning can be used for product and dose verification. If you stock the vials seen in **Figure 2** (page 1), pharmacies may also want to consider affixing an auxiliary label to remdesivir injectable solution vials to note the total amount of drug (100 mg) contained within. Also provide prescribers, pharmacy staff, and nurses with a Fact Sheet (www.ismp.org/ext/483) and/or Pharmacy Guide (www.ismp.org/ext/484) on remdesivir provided by the manufacturer. ISMP is in communication with Gilead about the label issue.

Failure to engage barcode medication administration (BCMA)

A hospital noticed that several COVID-19-related errors were undetected before reaching patients due to a failure to engage BCMA at the bedside. These errors were associated with COVID-19-induced staffing changes, which resulted in redeploying operating room (OR) nurses, who were not familiar with BCMA, to other patient care units. One error involved a redeployed OR nurse who administered an albuterol inhaler instead of the intended **BREO ELLIPTA** (fluticasone furoate and vilanterol) inhaler after failing to use the unfamiliar BCMA technology. The hospital learned that redeployed nurses require orientation to the patient population, technologies, processes, and medications typically used on the newly assigned unit.

Inability to weigh patients during telehealth encounters

An oncology clinic reported an unintended consequence of telehealth visits—the inability to document an accurate weight, leading to incorrect dosages of weight-based drugs. In this case, the patient had come into the clinic for her first chemotherapy treatment—protein-bound **PAClitaxel** and gemcitabine. Due to COVID-19, the patient had been participating in telehealth visits for several months prior to her first chemotherapy treatment, during which measured weights were not obtained or regularly updated. The patient's weight had not been measured or updated for 4 months; however, a weight was obtained when she arrived at the oncology clinic for her first dose of chemotherapy.

Unfortunately, the current chemotherapy plan had been based upon the previous weight measured 4 months ago. The patient had lost substantial weight since that time, and while double-checking the chemotherapy dose, the nurse noticed that the patient's body surface area (BSA) was 7% lower than the BSA listed on her chemotherapy treatment plan. In this organization, a BSA difference of 5% or greater

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container is labeled prior to storage and distribution. Updates to electronic drug databases as well as smart infusion pump drug libraries will be necessary, as typical infusion rates for propofol 1% will need to be halved with Propoven 2%. One positive change is that fewer bottle changes will be necessary for patients receiving Propoven 2% instead of Diprivan. Before use, organizations will also need to confirm that barcode scanning systems will provide correct information when Propoven 2% is scanned. The barcode used on the product is an international pharmaceutical manufacturing code and may not be appropriately recognized by scanning systems used in the US. You may need to affix your own printed barcode to the product.

A wall chart that compares Propoven 2% to Diprivan and provides additional information about the product can be found on the **last page of this newsletter** and also on the FDA website (www.ismp.org/ext/479). A Healthcare Provider Fact Sheet (www.ismp.org/ext/480) and a Patient and Parent/Caregiver Fact Sheet (www.ismp.org/ext/481) are also available. Please contact Fresenius Kabi USA Medical Affairs at 1-800-551-7176 (Option 3) with any additional inquiries about the product.

**Perhaps tall man letters would help**

Two doses of compounded hydroxychloroquine oral suspension were incorrectly drawn up instead of compounded hydro**CHLORO**thiazide oral suspension.

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Figure 1. Bottles of extemporaneously prepared hydroxychloroquine and hydro**CHLORO**thiazide were mixed up. Using tall man letters—hydro**OXY**chloro**QUINE** and hydro**CHLORO**thiazide—might help prevent confusion.

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requires a change in the dose; however, it took more than 2 hours to authorize a revised dose based on the patient's current BSA, delaying the beginning of chemotherapy administration. The clinic is working on a process to flag weights in the electronic health record that require updating prior to prescribing, dispensing, and/or administering weight-based medications. The clinic staff are now inquiring about weight loss or gain during all telehealth encounters.

Entering just a few letters for an ADC drug name search leads to an error

In the intensive care unit, a 40-year-old intubated man with COVID-19 received verapamil instead of **VERSED** (a former brand of midazolam). The patient had become agitated, so the physician verbally asked a nurse to increase the dose-rate of the patient's propofol infusion and to administer "Versed" 2 mg IV push. The nurse used the override feature in the automated dispensing cabinet (ADC) to select and access the drug "Versed" by entering the first few letters of the drug name. She accidentally selected and removed a vial of verapamil (5 mg/2 mL) from the ADC, which was available via override. The nurse administered verapamil IV push to the patient, believing it was "Versed." She did not employ the available bedside barcode scanning system because the medication was a verbal order and had not yet been entered into the health record. About 15 minutes later, the nurse recognized the error when documenting administration. The patient was monitored and suffered no long-term harm from the error.

The hospital is now assessing its verbal order practices, intending to eliminate their use except in emergencies; examining its ADC override practices, intending to restrict their use; increasing the minimum number of letters used when searching for drugs in the ADC; and taking all the necessary steps to optimize the bedside barcode scanning system. In our **Guidelines for Safe Electronic Communication of Medication Information** (www.ismp.org/node/1322), we recommend using at least 5 letters when searching for a drug in electronic systems. This error sounds eerily similar to a fatal ADC vecuronium-Versed mix-up, which was published in our January 17, 2019 newsletter (www.ismp.org/node/1366). Please see that newsletter issue for recommendations related to limiting and monitoring ADC overrides and safe drug name searches.

Missed doses

One hospital analyzed numerous reports of missed medication doses for COVID-19 patients. Some reports involved missed doses of albuterol inhalers due to communication failures between nurses and respiratory therapists at the beginning of the COVID-19 pandemic. With improved communication strategies between departments, the issue has since been resolved. Other reports of missed doses related to the need to frequently enter patients' rooms for drug administration. This resulted in further consolidation of standard medication administration times so that efforts to conserve personal protective equipment (PPE) and nurses' time at the bedside could be continued.

If you would like to subscribe to this newsletter, visit: www.ismp.org/node/10



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Both medications were in the same size amber bottles (**Figure 1**, page 2) and were apparently near one another on a medication dose preparation counter when the wrong bottle was accessed. The computer-generated pharmacy labels look similar overall, as do the medication names, especially at first glance. Ensuring separate storage, even on drug preparation counters; affixing a barcode on extemporaneously prepared oral suspensions/solutions; and scanning the barcode prior to dose preparation can help prevent errors.

Hospitals might also want to consider using tall man letters (uppercase and bolding) when expressing the drug names on computer-generated labels. Tall man letters for hydro**CHLORO**thiazide have been previously recommended to prevent confusion with hydro**OXY**zine. Using tall man letters for hydro**OXY**-chloro**QUINE** might also be helpful in decreasing the products' similar name appearance.

 Announcement**Participate in CHAMPS study**

Villanova University Fitzpatrick College of Nursing has launched a national study on the experiences and self-reported health and well-being of healthcare professionals, first responders, essential workers, and service staff who are providing support for patients and the community during the COVID-19 pandemic. The study, **Caring about Health for All** (called the **CHAMPS** study), will assess the short- and long-term physical, social, and behavioral health of all who are involved in supporting or delivering care to COVID-19 patients. The researchers hope to learn from this experience and understand the broad scope of the impact on the health of those on the front lines and their potential future health needs. Outcomes will be followed longitudinally for 20 years. If you work in any setting that treats COVID-19 patients or in the community as a first responder, please consider participating in this important study. For details and to enroll in the study, visit: www.ismp.org/ext/482.

Special Propofol Alert

Key Differences between Fresenius Propoven 2% (Propofol 20 mg per mL) Emulsion for Injection or Infusion and Diprivan® Injectable Emulsion, USP 10 mg per mL

Important Information	Fresenius Propoven 2% (propofol 20 mg per mL) Emulsion	Diprivan Injectable Emulsion, USP 10 mg per mL
Fresenius Propoven 2% (propofol 20 mg per mL) is double the concentration of US approved Diprivan® 10 mg per mL (propofol 1%). Exercise caution and implement steps to ensure dosing calculations, infusion rates, and infusion pump settings are accurate.		
Active Ingredient	Propofol	Propofol
Concentration	20 mg per mL (2%)	10 mg per mL (1%)
Strength	2,000 mg per 100 mL	1,000 mg per 100 mL
Fill Volume	100 mL	100 mL
Description	Single Dose Vial for Single Patient Use Only	Single Dose Vial for Single Patient Use Only
Anti-microbial Retardant	Does not contain ethylenediaminetetraacetic acid (EDTA)	Contains EDTA
Excipients	Contains a combination of medium-chain triglycerides (MCT) and long-chain triglycerides (LCT)	Contains long-chain triglycerides (LCT)

Fresenius Propoven 2% Emulsion contains the same active ingredient, propofol, as DIPRIVAN®, but in a higher concentration. **Propoven 2% has double the concentration of propofol compared to DIPRIVAN®.**

Special attention is needed to ensure accurate dosing calculations and infusion rates.

- Consider addition of the new concentration (20 mg per mL) to the drug library of the respective pumps and to electronic health records (EHR).
- Institutions should confirm that barcode systems provide correct information when the product is scanned. The barcode used on Fresenius Propoven 2% Emulsion is an international pharmaceutical manufacturing code and may not be appropriately recognized by scanning systems used in the United States.

Institutions should take extra care during preparations and administration as the Fresenius Propoven 2% (propofol 20 mg per mL) labeling information is NOT expressed in typical US format (total strength per total volume).

For questions regarding Fresenius Propoven 2% Emulsion in the United States, please contact

Fresenius Kabi USA Medical Affairs at 1-800-551-7176 Option 3,
Monday – Friday, between the hours of 8 a.m. and 5 p.m. (CST)
or e-mail: medinfo.USA@fresenius-kabi.com

SEE AUTHORIZED FACT SHEET FOR HEATHCARE PROVIDERS

- Fresenius Propoven 2% Emulsion is not FDA-approved
- Fresenius Propoven 2% Emulsion has been authorized by FDA for use under an Emergency Use Authorization (EUA)
- Fresenius Propoven 2% Emulsion is authorized only for the duration of the declaration that circumstances exist justifying the authorization of the emergency use under Section 564(b)(1) of the Act, 21 U.S.C. § 360bbb-3(b)(1), unless the authorization is terminated or revoked sooner