

## When the Indications for Drug Administration Blur

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### Case Objectives

- Discuss five patient safety targets associated with this case
- State the eight rights of medication administration
- Recognize the importance of documentation of all medications
- Acknowledge the importance of handoffs in reducing medication errors
- Identify unique challenges associated with care during the night shift

### The Case

A 55-year-old woman was admitted to the intensive care unit (ICU) with necrotizing pneumonia and underwent a pneumonectomy and tracheostomy. While in the ICU, she had a seizure; however, the workup for the seizure did not reveal a clear etiology. After the seizure she was prescribed lorazepam 4 mg intravenously every 2 hours as needed for seizure. She tolerated the tracheostomy collar support and was stable for 24 hours and was then transferred from the ICU to the inpatient floor. The medication list was not

revised during the transition.

On the inpatient floor she was generally stable, but on the night shift she became anxious and could not sleep. The nurse checked her vitals, which were normal and seeing lorazepam on her medication list, gave lorazepam 4 mg to help alleviate the anxiety. After the first dose, the patient was able to sleep for a short period but woke with more anxiety. The nurse repeated the lorazepam each time the patient complained of anxiety, resulting in a total of 4 doses, or 16 mg, of intravenous lorazepam over the course of 12 hours.

When the morning shift change occurred, the morning nurse evaluated the patient and found her to be barely arousable with a very low blood oxygen saturation of 89-90%. Only one dose of lorazepam had been documented as given during the night shift, and the night nurse did not communicate the additional undocumented doses when she signed out, leaving the morning nurse unsure as to the cause of the decrease in mental status and low blood oxygen. The Rapid Response Team was called immediately, and the patient was placed on a ventilator. Upon later finding out she had received 16 mg of intravenous lorazepam overnight, she was moved back to the ICU for treatment of altered mental status due to iatrogenic medication overuse. Subsequently, the patient improved, was extubated, and eventually returned to her baseline mental status and was safely transferred back to the floor.

## The Commentary

*By Julia Munsch, PharmD and Amy Doroy, PhD, RN*

Benzodiazepines, including lorazepam, are effective for termination of seizure activity, especially in early stages.<sup>1</sup> Recommended dosing from the American Epilepsy Society is lorazepam 0.1 mg/kg, maximum 4 mg, may repeat once.<sup>2</sup> Benzodiazepines are commonly used during hospitalization for a variety of indications; however, this class of drugs is frequently associated with errors that can result in adverse events including falls, central nervous system depression and respiratory depression.<sup>3</sup> Due to their high-risk nature, extra attention is essential when ordering, verifying, and administering benzodiazepines.

The following Patient Safety Targets were unmet in this case:

- Thorough medication reconciliation
- Accurate medication administration according to the practitioner's order
- Appropriate and timely assessment of response and consideration of efficacy
- Complete documentation and handoff communication regarding the medication and patient status
- Availability of colleagues for consultation

Even partial achievement of these targets would have reduced the risk of harm to the patient.

### Causes of Medication Error and Adverse Outcomes

Medication administration is complex and often leads to errors and adverse outcomes when best practices are not followed. Providers should always reconcile medications when transfer orders are written and prior

to transfer to another level of care. In this case, the discharging prescriber should have discontinued the order if seizure activity had subsided or at least limited its use to “one time only and then notify the physician.” While pharmacy staff may have reasonably assumed that seizure activity was ongoing and that an order was warranted, they could have intervened to revise the frequency, in consideration of the transfer to a lower level of care. Discontinuing the order or replacing it with a more conservative order for seizure management would have reduced the risk of harm to this patient.

The night nurse caring for this patient did not follow the “8 Rights of Medication Administration,” which are: the right patient, the right drug, the right dose, the right route, the right time, the right documentation, for the right reason and the right response.<sup>4-7</sup> The nurse should have recognized that lorazepam 4 mg every two hours intravenously as needed is a high-risk medication even when given for seizures, especially in a patient with no recent history of benzodiazepine use. The nurse should also have recognized that this dose of lorazepam is inappropriate for anxiety, which would typically be treated with a lower dose. They might have further questioned the intravenous route of administration for the indication of anxiety. Because of the failure to recognize this as a high-risk medication, the night nurse did not consistently assess the patient’s response to the medication, or they would have recognized the patient’s change in level of consciousness before she became less than fully alert. Lastly, the night nurse failed to document the medication and the patient’s response to each dose of the medication and failed to provide shift-to-shift handoff communication, leaving the day nurse without critical information needed to care for this patient. There was also a failure of systems to prevent this situation from happening.

Typically, the electronic health record (EHR) could help to prevent medication errors and adverse events through hard stops when maximum doses are exceeded; that did not happen in this case even though excessive doses of lorazepam were administered. Additionally, because the night nurse in this case did not document the lorazepam, the Rapid Response Team did not readily know the cause of the respiratory problem. In addition to the harm to this patient, this night nurse put the hospital at legal risk by failing to follow several of the 8 “rights” of medication administration including: the right dose, the right time, the right documentation, the right reason and the right response.

### **Review of Existing System Structures using a Quality Improvement Lens**

The occurrence of this error and the resulting adverse event during night shift is probably not a coincidence. Multiple complicating factors exist at night, including the well documented effect of sleep disturbance on shift workers.<sup>8</sup> Also relevant to this case is the reduced presence of other health care providers, such as a physician or pharmacist, to consult with during night shift. It is possible the night nurse intended to check the patient more frequently but was stretched too thin providing care to other patients; the workload is often heavier for night nurses and there are fewer resource nurses available to provide guidance.<sup>9</sup> New, inexperienced nurses are often placed on night shift, adding another element of risk. Hospitals must ensure that new graduates and nurses with less experience have adequate supervision and mentoring. This requires both appropriate staffing levels with adequate numbers of nurses (based on the case-mix of patients) and enough experienced nurses and supervisors to provide oversight.<sup>10</sup> Programs that provide strong orientation and onboarding, not only to the hospital but also to working on night and/or

weekend shifts when supportive resources are limited, can be helpful in reducing errors and harm to patients.<sup>11</sup> Nurses must document all instances of medication administration as required by their state's Nurse Practice Act and Code of Regulations. Health systems have made attempts to decrease the likelihood of adverse drug events by implementing health information technologies such as EHR systems with embedded alerts, handheld barcode medication administration devices that document medications as they are administered in real time, and electronic medication administration records.

The approach to anxiety and insomnia in hospitalized patients should start with non-pharmacologic sleep hygiene measures including a dark and quiet environment, comfortable temperature and bedding, caffeine avoidance, and limited interruptions.<sup>11,12</sup> Pain control is another important factor for which treatment is usually pharmacologic and can be deliberately utilized to promote sleep by administration at bedtime. Additionally, more often given the opioid crisis, multi-modal pain control strategies are commonly utilized with both pharmacologic and non-pharmacologic interventions to decrease the usage of opioids and promote sleep. Whether pharmacologic intervention improves sleep in hospitalized patients remains unclear but common initial treatments include melatonin or low dose oral benzodiazepines ordered to be administered as needed.<sup>12</sup> Persistent or extreme anxiety and insomnia warrant an investigation of underlying causes before more aggressive treatment. Repurposing a medication for another indication without consulting the physician is never appropriate. Even if a nurse is experienced with using a certain medication to treat the indication in question, order parameters such as dose, route and frequency often vary widely depending on the indication.<sup>12</sup>

In most community hospitals there are few physicians or pharmacy staff available to the inpatient units at night. A hospitalist might be available, but at night they tend to be focused on patients in the intensive care and step-down units and do not round regularly on the medical-surgical units unless called upon. Had they been making regular rounds, as is done on day shift, the rounding physician(s) or service-based pharmacist might have noticed and investigated the repeated lorazepam doses, prompting realization of the error before the patient became obtunded.

Lastly, restorative sleep initiatives may lead to the expectation that all patients need to be sleeping at night, which can be problematic in some cases.<sup>13</sup> The encouragement of restorative sleep does not come with the explicit expectation to appropriately monitor response to a given medication. In this example, the expectation of sleep/rest may have resulted in the night nurse having a lower threshold for giving medication to treat anxiety to encourage better sleep. This can create a risk to patient safety because of the difficulty in monitoring for oversedation; determining whether a patient is sleeping versus becoming more obtunded or less alert can be challenging.

## Take-Home Points

- Review and adjustment of medication orders upon patient transfer is an important safeguard to prevent inappropriate and/or unnecessary orders remaining in effect.
- Consistent use of the 8 Rights of Medication Administration is essential.

- Reading the complete medication order, including “as needed” indications and administration instructions, is critical for ensuring medications are given for the correct reasons.
- Assessment of patient response is crucial for ascertaining whether an ordered medication is having the intended or an unintended effect.
- Documentation of medication administration and thorough communication—preferably a warm handoff—helps ensure that incoming staff are fully informed about patients’ conditions.
- Night shift presents unique challenges related to limited resources (fewer colleagues with whom nurses can confer, absence of a service-based pharmacist and rounding physicians who might notice and question drug administration events and patient responses) and sleep expectations.

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