

Drug Shortage Impact on Medication Errors

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Disclosure Information

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SafetyBriefs

⚡ Doribax-Zovirax name confusion. At a hospital where medication orders are routinely entered by unit secretaries, a handwritten physician order for DORIBAX (doripenem), a carbapenem-type antibiotic, was incorrectly entered as ZOVIRAX (acyclovir) 500 mg IV q8h (see Figure 1). For verification, a copy of each order was also

Zovirax 500mg IV q8h

Figure 1. Zovirax or Doribax?

scanned and sent to a unit-based pharmacist covering the area. The pharmacist reviewing the order initially agreed that it appeared to be the antiviral, Zovirax, but later admitted that there was probably some bias on his part, since the order was already entered as Zovirax by the unit secretary. Also, 500 mg IV q8h would be an appropriate dose for Zovirax. However, this order was written by a pulmonologist, which seemed unusual, so the pharmacist decided to investigate. When he accessed an electronic copy of the history and physical, he did not see an indication for Zovirax, at least on the initial admission history. To determine if he needed to contact the physician, he went to the unit (a medical ICU) to read the physician's latest progress note to get a full picture of the situation. There, Doribax was clearly written. There may be a risk in having unit secretaries interpret orders and perform order entry, as they may see the drug names with which they are most familiar due to confirmation bias and/or may not be fully concentrating on the process, especially when there are high volumes of orders and frequent interruptions. Had the ordering physician been an infectious disease specialist, the order might not have been questioned. Nevertheless, due to potential carbapenem resistance, limiting the prescribing of Doribax to infectious disease physicians is best.

⚡ Ambiguous directions, wrong assumption by patient. A 67-year-old male arrived at a hospital emergency department (ED) with hypotension, tachycardia,

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Special Issue

Drug shortages: National survey reveals high level of frustration, low level of safety

An exhaustive account of frustrations, difficulties, and patient safety concerns came across loud and clear from more than 1,800 healthcare practitioners (68% pharmacists) who participated in our July-September 2010 survey on drug shortages.¹ Many respondents stated that the conditions associated with drug shortages during the past year have been the worst ever, without a glimmer of hope for any improvement in the near future. They feel unsupported by the Food and Drug Administration (FDA) and perplexed regarding why the US is experiencing drug shortages of epic proportion that are often associated with third-world countries. Respondents clearly believe the public is severely impacted by this issue, and several suggest that the problem has risen to the level of a national public health crisis.

By far, respondents were most alarmed by: the ever-increasing volume of critically important medications in short supply; the use of less desirable, often expensive, unfamiliar alternative drugs—if even available; the potential for errors and poor patient outcomes caused by absent or delayed treatment or preventable adverse drug events associated with alternative drugs or dosage forms; the lack of advanced warning about an impending shortage; and precious clinical hours lost to time-consuming activities required to manage drug shortages.

Frequency of drug shortage difficulties

During the past year, more than half of the respondents reported *frequently or always* encountering every one of the potential difficulties associated with drug shortages identified in our survey, which are listed in the next column in descending order starting with the most frequently encountered difficulty:

- Little or no information available about the duration of a drug shortage (85%)
- Lack of advanced warning from manufacturers or FDA to alert practitioners to an impending drug shortage and suggested alternatives (84%)
- Little or no information about the cause of the drug shortage (83%)
- Substantial resources spent investigating the shortage and developing a plan of action (82%)
- Difficulty obtaining a suitable alternative product (80%)
- Experience a significant financial impact (78%)
- Lack of a suitable alternative product (70%)
- Substantial resources spent preparing and/or administering the alternative products (69%)
- Risk of adverse patient outcomes (64%)
- Internal hoarding of medications associated with impending shortages (58%)
- Physician anger towards pharmacists/nurses/hospital in response to a drug shortage (55%).

Physicians and pharmacists, particularly pharmacy managers and directors, reported encountering the above-listed problems more frequently than nurses, especially in areas such as spending resources to investigate shortages, developing a plan of action, hoarding medications in short supply, obtaining a suitable alternative, and experiencing the financial impact of purchasing drugs off contract or through secondary markets, or higher rushed delivery costs. While all professional disciplines clearly reported grave concerns regarding the risk of adverse patient outcomes during drug shortages, physicians reported encountering this risk more frequently than others, preceded in frequency only by

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Drug Shortages

- Clinical effects of shortages
 - Compromise or delay medical treatment/procedures
 - Result in failure to treat and progression of disease
 - Pseudomonas patient sensitive only to amikacin
 - anesthesia awareness
 - chemotherapy regimen modified

Drug Shortages

- Over 1,000 medication errors reported, many with adverse outcomes
 - Hydromorphone-morphine errors
 - Epinephrine 1:1,000 given without dilution
 - Difficulty calculating ratio using expressions
 - Vin**BLA**Stine shortage led to replacement with vin**CRIS**tine
 - Parenteral nutrition electrolyte errors – (may involve numerous patients due to use of automated IV compounders)

Compromised technique during sterile compounding from active pharmaceutical ingredient

- Heparin flush solutions (Life-threatening cases of *Burkholderia cepacia* sepsis)
- Betamethasone injection (meningitis, epidural abscess)
- Magnesium sulfate injection (*Serratia marcescens* bloodstream infections)
- Prefilled heparin and saline syringes (*Pseudomonas* bloodstream infections)
- Amino acid solutions (9 deaths - *Serratia*)
- Bevacizumab (Blindness multiple patients)

Drug shortages

■ Financial effects of shortages

- Expend tremendous resources
 - Costly alternative medications for provider and patient
 - Significant time spent on addressing shortages
 - Additional costs associated with treatment of adverse outcomes

■ Emotional effects of shortages

- Frustration, anger, mistrust
- Strain professional relationships
- Ethical/moral decisions

Additional Difficulties

- Inability to keep up with important safety initiatives
 - LASA efforts
 - Double checks
 - Medication reconciliation
- Sterility and stability issues with nursing/pharmacy compounded products vs. manufacturers' products
 - Gray market issues
 - Where is drug coming from?
 - How stored? Counterfeit? Stolen?

Additional Difficulties

- Delay in updating computer systems/bar-coding systems with alternative products/strengths
 - Possible dispensing and administration errors
- Using opened medications past safe period of time
- Using single-dose/unit-of-use containers for multiple patients