

# ISMP Medication Safety Alert! <sup>®</sup> Acute Care

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## Safety Briefs



### Scan product, not storage

**container label.** A vial of generic sulfamethoxazole and trimethoprim injection was accidentally placed in a pharmacy shelf bin meant for EPINEPHrine injection 30 mL multiple-dose vials. Sometime later, a technician went to remove an EPINEPHrine vial from the bin as part of a refill process for automated dispensing cabinets (ADCs) located on nursing units. The technician scanned a drug identification label on the medication bin but did not scan the label on the vial itself. The vial was placed in a ziplock bag with a barcoded label and then placed with other items for the surgery department ADCs. A pharmacist checked the item by scanning the barcode on the ziplock bag but, again, not the vial inside the bag. Later the technician placed the item in the ADC, again scanning the barcode on the ziplock bag, which matched the ADC barcode where the product was stored. When performing a monthly ADC check as required by the pharmacy's state regulations, a pharmacist discovered the error and removed the erroneous vial. The size, shape, and colors of the vials, seen in Figure 1, are similar, especially when one vial among many is oriented in a bin where the drug name is not visible. The hospital has now switched to a different manufacturer for the sulfamethoxazole-trimethoprim product to help avoid mix-ups.



**Figure 1.** Vials resemble each other, particularly when the front of the labels face away from the healthcare practitioner.

Although bar-coding technology, automated dispensing, and multiple checks can dramatically decrease the potential for product mix-ups, only scanning the barcode on the product label itself when removed from bins, ADC pockets, or

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## Ohio government plays **Whack-a-Mole** with pharmacist

On August 14, 2009, Ohio pharmacist Eric Cropp was sentenced to 6 months in prison, 6 months of home confinement with electronic monitoring, 3 years of probation, 400 hours of community service, a \$5,000 fine, and payment of court costs, for his role in a fatal medication error. (Early last week, ISMP President Michael Cohen posted comments regarding the sentencing at: [www.ismp.org/pressroom/injustice-jail-time-for-pharmacist.asp](http://www.ismp.org/pressroom/injustice-jail-time-for-pharmacist.asp).) Eric made a human error that tragically led to the death of a child—the fodder of nightmares that plague many health professionals who perpetually fear making that one fatal error. During manual inspection of a compounded chemotherapy solution, Eric failed to recognize that a pharmacy technician had made the base solution using too much 23.4% sodium chloride. The child received the chemotherapy solution and developed severe hypernatremia, which led to her death.

Human factors research confirms that manual checking systems are not 100% reliable. Under *ideal* conditions, we—meaning all human beings—fail to perform a check correctly about 5%<sup>1,2</sup> of the time, and we fail to detect an error during the checking process between 5%<sup>2</sup> and 10%<sup>3</sup> of the time. While under *moderate stress*, our failure to detect an error during an inspection or verification process increases to about 20%.<sup>4,5</sup>

According to news media<sup>6-8</sup> and personal conversations with Eric's defense attorneys, conditions under which Eric was working on the day of the event were far from ideal and outside his control:

- The pharmacy computer system was down in the morning, leading to a backlog of physician orders


- The pharmacy was short-staffed on the day of the event
- Pharmacy workload did not allow for normal work or meal breaks
- The pharmacy technician assigned to the IV area was planning her wedding on the day of the event and, thus, highly distracted
- A nurse called the pharmacy to request the chemotherapy early, so Eric felt rushed to check the solution so it could be dispensed (although, in reality, the chemotherapy was not needed for several hours).


We don't have details regarding how verification of IV admixtures occurred in this hospital, but we have observed unsafe variations of the checking process in other hospitals—from a jumble of vials and syringes pulled back to the supposed volume of additives, to vials and syringes from different admixtures together on a cluttered surface awaiting verification. We also know little about why the technician made the compounding error, other than press reports stating she was highly distracted that day. However, we know that compounding a chemotherapy base solution from scratch is error-prone and often unnecessary; such exactness of base solutions is frequently not required from a clinical standpoint.

The price of this medication error was ever so costly: a beautiful 2-year-old child named Emily Jerry lost her life; Emily's family will forever suffer the pain of her loss; healthcare practitioners who were involved in the error and/or Emily's care are forever changed by the event; and Eric Cropp, who will never practice again (the Ohio board of pharmacy permanently revoked his license), will forever feel the weight of his human fallibility and how it played out on that fateful day—this while serving an undeserved term of incarceration and other criminal and civil penalties.

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carousels can assure the correct product has been selected. Drug storage bin labels should never be used to identify products. Incidentally, had the mix-up taken place the other way around (EPINEPHrine dispensed for sulfamethoxazole-trimethoprim), and had a patient actually received the wrong drug, the error almost certainly would have been lethal.

 **Kapidex or Capadex?** In our August 13, 2009 newsletter, we warned about mix-ups between **KAPIDEX** (dexlansoprazole) and **CASODEX** (bicalutamide). Since then, we heard from a pharmacist who received a prescription from a doctor's office via telephone for Kapidex. The office nurse had misspelled the drug as "Capadex," probably because she heard the doctor pronounce the drug name and then transcribed it phonetically. When the pharmacist tried to enter the medication into the computer, he could not find "Capadex." The pharmacist asked others in the pharmacy if the prescribed drug could be Casodex. Meanwhile, one of the pharmacists searched "Capadex" using Google to see if it was an actual product. He saw many listings for "Capadex" as well as a listing for Kapidex. But "Capadex" is a foreign product containing acetaminophen and propoxyphene (similar to **DARVO-CET**) available in Australia and New Zealand, and online. At least one site advertises that no prescription is needed. We've notified FDA about this new issue associated with the brand name "Kapidex." Given that the name is being confused with Casodex and could lead to dangerous confusion with the foreign product Capadex, this might be a case where a name change is appropriate.

 **Arginine errors in pediatrics.** Last month, an FDA *Drug Safety Newsletter* included information from a post-market safety review of arginine hydrochloride injection (**R-Gen 10**), a drug used to evaluate pituitary function ([www.fda.gov/Drugs/DrugSafety/DrugSafetyNewsLetter/ucm167883.htm](http://www.fda.gov/Drugs/DrugSafety/DrugSafetyNewsLetter/ucm167883.htm)). FDA has received several reports of errors and other adverse events with this drug. Reports from FDA's Adverse Events Reporting System (AERS) include four fatal overdoses in pediatric patients. One of these cases was reviewed in the January 31, 2008, *ISMP Medication Safety Alert!* ([www.ismp.org/Newsletters/acutecare/articles/20080131.asp](http://www.ismp.org/Newsletters/acutecare/articles/20080131.asp)). A number of prevention suggestions were included in this newsletter and should be considered wherever and whenever arginine hydrochloride is stored, prepared, or administered.

**Whack-a-Mole** continued from page 1

David Marx, CEO of Outcome Engineering, likens such a punitive response to human error to a child's game of **Whack-a-Mole**. The game is played by lying in wait until a mole (the adverse event) pops up, and then trying to whack the exposed mole with a hammer (to punish the person closest to the event) before it retreats back into the safety of its hole. In his profoundly moving new book on this topic, *Whack-a-Mole: The Price We Pay for Expecting Perfection*<sup>9</sup> (available at Barnes & Noble), Marx notes that this child's game is a telling depiction of how we set unrealistic expectations of perfection for each other and then unjustly respond to our fellow human beings who inevitably make mistakes. We play the game at work by writing disciplinary policies that literally outlaw human error. Our legislators play the game by writing laws that make human error a felony punishable by prison. We take the easy route with a "no harm (no visible mole), no foul (no whack required)" policy. We turn a blind eye to those imposing unnecessary risk as long as the outcome is good (no mole pops up). But we push our need for perceived "justice" to the point that every harmful adverse outcome must have an accompanying blameworthy person to punish.

According to Marx, the **Whack-a-Mole** game is simple and addicting: a healthcare professional makes a harmful error and the healthcare system in which he works fires him—**whack!** The professional licensing board takes his license away—**whack!** The newspapers and online news media demonize the dedicated professional who has made the mistake—**whack!** The civil court demands payment from the professional for the bad outcome—**whack!** The criminal court sends him to jail—**whack!** Leaders in the healthcare system who employed him stand by silently, without uttering a single word about the system-based causes of the error to help defend the individual—**whack-whack!** Society is poised to pounce, to swing the hammer when someone is injured. Punish the person most visibly involved in the error

and the game is won. Problem solved. Mole whacked. As Marx writes, the "if we all just do our jobs correctly and follow the rules" club tends to view all bad outcomes as blameworthy incidents—even in the presence of poorly designed systems and performance shaping factors outside the control of involved workers; even in the absence of an intent to harm or an evil-meaning mind.

No matter how hard we try, human endeavors carry inherent risks. We can try to do everything possible to make it safe for patients, but we often fail to plan for the unexpected—a computer system that is nonfunctional when you arrive at work, causing a serious backlog of work; an inadequate level of staff on duty because of unexpected absences; a distracted technician working in a hectic high-risk IV area—just a few of the unexpected conditions in Eric's case on the day of the event. As Marx notes in his book, civil, criminal, and regulatory systems are increasingly obscuring the differences between intentional, risky choices and inadvertent human fallibility. Thus, the net cast to catch criminals is now catching those whose only crime is that they are human. The criminal courts are playing the most extreme version of **Whack-a-Mole** with the lives of all healthcare professionals, for who among us cannot say, "It could have been me" when thinking about the plight of Eric Cropp and Emily Jerry?

Marx makes it clear in his book that playing the **Whack-a-Mole** game costs us dearly, in lives that will continue to be lost due to our failure to learn from mistakes, and in resources that could be put to better use. When we play the game, it does nothing to enable us to learn what we might do differently the next time to avoid a similar tragedy. In fact, ISMP is unaware of steps to help other Ohio hospitals learn from this event and redesign their systems accordingly. We have not heard about any visits by state surveyors to detail expectations regarding prevention strategies in all

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## Worth Repeating... Valtrex (valacyclovir) and Valcyte (valganciclovir) confusion

In our June 26, 2002, newsletter we wrote about an error involving a mix-up between **VALTREX** (valacyclovir) and **VALCYTE** (valganciclovir), mentioning how easy it is to confuse the two drugs. Since then, other mix-ups have been reported to the ISMP Medication Errors Reporting Program (ISMP MERP). The generic names for these two drugs are strikingly similar, and both the brand and generic names of the products start with the prefix “val,” contributing to look- and sound-alike confusion. Both have uses associated with cytomegalovirus (CMV) and may be used in immunosuppressed patients with human immunodeficiency virus (HIV) or transplant patients. Valtrex is used in the treatment of shingles (herpes zoster), cold sores (herpes labialis), genital herpes (herpes genitalis), and as prophylaxis for prevention of CMV in patients with advanced HIV or after transplantation. Valcyte is used in the treatment of CMV retinitis in patients with acquired immunodeficiency syndrome (AIDS) and also for prevention of CMV in kidney, heart, and kidney-pancreas transplant patients. Also, valacyclovir is metabolized to acyclovir while valganciclovir is metabolized to ganciclovir, all of which are drug names that are easily confused, too.

The June 26, 2002, report involved a doctor prescribing the wrong drug, but other error reports involve nurses and pharmacists who confused the drugs while transcribing and dispensing them, or misinterpreted the drug name due to poor handwriting. For example, a pharmacist recently notified us about a colleague who noticed that a heart transplant patient had received valacyclovir in error for 10 days. The drug had been chosen incorrectly by the prescriber from a computer selection screen.

For either of these drugs, we'd highly recommend using both the brand and generic names when referring to them and determining their purpose when processing the orders. We also recommend using tall man letters when listing the drugs in computerized inventories: consider using **valACYclovir** and **valGANCIClovir**. You might also be able to configure a computer alert to warn of the risk of mix-ups during order entry. We are considering adding these drugs to our unofficial list of product names that should be expressed using tall man letters ([www.ismp.org/tools/tallman\\_letters.pdf](http://www.ismp.org/tools/tallman_letters.pdf)).

## Whack-a-Mole continued from page 2

Ohio hospitals. If nothing has changed in Ohio hospitals, as well as other hospitals in the US, the death of this little girl is a heartbreaking commentary on healthcare's inability to truly learn from mistakes so we are not destined to repeat them. On a positive note, though, the Ohio legislature passed and implemented Emily's Law (<http://lsc.state.oh.us/analyses/analysis127.nsf/c68a7e88e02f43a985256dad04e48aa/443d752e6fc207bb85257505053b835>), which requires all pharmacy technicians to be trained, tested, and certified via a state board of pharmacy approved course, as they are in 26 other states.

There is another insidious flip side to the **Whack-a-Mole** game; it prevents learning by driving errors underground and discourages students from becoming healthcare professionals. Some will ask, “Why disclose errors and risk punishment, loss of a hard-earned license, going to jail?” Thus, some risks will not be addressed to prevent harm. College students may not be drawn to legally “risky” healthcare professions, and professionals working in healthcare may try to avoid risky tasks, such as compounding IV solutions.

Marx makes a compelling argument that the **Whack-a-Mole** approach is ineffective, inefficient, unsafe, and wholly unjust. There is a better way of dealing with human error and promoting the behavioral choices that best support safety. We spend far too much time reacting to the severity of the outcome and punishing the unfortunate soul closest to the harm, and far too little time addressing the system design that got us to the bad outcome and the behavioral choices that might have contributed to the outcome. A bad outcome should never automatically qualify a practitioner for blame and punishment. We will never be able to design a perfect healthcare

system because it is predominantly a human-based system despite our ever-increasing use of technology. Likewise, we cannot and should not expect perfection from each other, no matter how critical the task may be. We are fallible human beings destined to make mistakes along the way, as well as to drift away from safe behaviors as perceptions of risk fade when trying to do more in resource-strapped professions. Our real power to protect patients is in the systems we build around imperfect human beings.

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