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ISMP

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

ISMP National Vaccine Errors Reporting Program 2017 analysis (Part I): *Vaccine errors continue with little change*

Although vaccination ranks high among the greatest public health achievements of the twentieth century, the success of any individual vaccine relies on correct and widespread administration to the appropriate patient population. Vaccine errors threaten to undermine the protection immunizations provide and often leave patients inadequately protected against serious diseases such as hepatitis A and B, pertussis, diphtheria, cervical cancer, and many others. An analysis of 575 events submitted to the ISMP National Vaccine Errors Reporting Program (ISMP VERP) between January and December 2017 suggests that errors with vaccines continue to occur. Also, the number of error reports submitted to the ISMP VERP in 2017 increased by more than 100 reports compared to prior years since 2012. The most frequent types of vaccine errors reported during 2017 included:

- Wrong vaccine (23%)
- Wrong dose (19%)
- Expired vaccines or contamination/deterioration (19%)
- Wrong age (17%)
- Wrong time or interval (8%)
- Vaccine/component omission (e.g., only diluent or a single component of a two-component vaccine administered) (4%)
- Wrong route (2%)
- Wrong patient (1%)

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Workbook of preliminary comparative assessment data available to participants

The **Preliminary Comparative Data from the ISMP Medication Safety Self Assessment® for High-Alert Medications** workbook is now available to participants who submitted their findings to ISMP. The workbook contains 4 tables and 9 graphs of aggregate data that can be used by participants to compare their results to the aggregate results of demographically similar US facilities. Inpatient, outpatient, and prioritization worksheets are also provided. To access the workbook and associated worksheets, log in to your account at: https://ismpassessments.org/high_alert/, and click on the links titled "Results Workbook" and "Results Worksheets" in the top right corner of the page.

Help ISMP update its list of high-alert medications

It's been more than 4 years since we last surveyed readers and updated the **ISMP List of High-Alert Medications in Acute Care Settings**. Please take a few minutes to complete our 7-question survey (copy on **pages 6-7**) and submit your responses to ISMP at: www.ismp.org/ext/28. We would appreciate your opinion about possible deletions or additions to the list before we update it. We thank you for taking the time to provide your perspective on this important topic!

ISMP consulting services… Look what you may be missing

We're often asked if we provide medication safety consulting services to healthcare organizations; the answer is, yes! Because our only focus is medication safety, ISMP Consulting Services offers a unique, educational, and objective perspective on practice, technology, and system issues associated with all aspects of the medication use process. In addition to a full prospective risk assessment of the medication use system, ISMP consultants can offer an unbiased viewpoint when investigating medication-related sentinel events or conduct focused assessments of specialty services (e.g., pediatrics, oncology, ambulatory surgery). ISMP's expertise is also ideal to assist you when focusing on certain high-alert medications, technology implementation, optimization of error reporting and detection, management of safety data, and the creation of a medication safety infrastructure.

Tailored to the organization's size and scope of service, an interdisciplinary team that may include specialists in key areas (e.g., pediatrics, oncology, technology) directly observes current medication processes and meets with frontline practitioners, management and administrative staff, and medication-related safety committee members to learn their unique perspectives on current practice. At the completion of the onsite assessment, the team holds a summary conference, followed by a customized written report of recommendations and implementation tools that are specific to your organizational needs, capabilities, and culture. The team remains available post-consult for questions. In addition to the confidential nature of these services, ISMP is a Patient Safety Organization (PSO) and can structure its work to best protect your patient safety information. Inquire about our services via our website (www.ismp.org/consulting-services), email (consults@ismp.org), or by calling 215-947-7797. We are here to help!

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Healthcare setting, involved providers, and reported harm

Since most vaccines are administered in the outpatient setting, practically all of the reported errors occurred in outpatient medical or public health clinics (54%), doctors' offices (31%), hospital ambulatory settings (6%), or pharmacies (2%). Only 3% of the errors occurred in hospital inpatient settings, and 4% in other settings. Most of the errors occurred within a family practice (48%) or pediatric practice (27%) setting. More than half (54%) of the errors involved medical assistants. While none of the reported errors caused immediate harm to a patient, absent or improper vaccination may have detrimental effects on individual and public health, leading to disease outbreaks, loss of herd immunity that may propagate an epidemic, costly overvaccination and re-vaccination, and consumer skepticism or refusal of vaccination.

Involved vaccines and contributing factors

Wrong age or dose. The top 10 vaccines involved in reported errors are listed in **Table 1** (page 3), along with the most frequently reported contributing factors. Overall, the vaccines involved in the most frequently reported errors have not changed since 2012, and these errors occurred for many of the same reasons previously noted during analysis of the ISMP VERP data between 2012 and 2016, particularly:

- Age-dependent formulations of the same vaccine
- Unfamiliarity with the indicated ages for vaccines
- Failure to verify the patient's age before administration
- Unfamiliarity with the dosing of vaccines

These contributing factors most often led to wrong age or wrong dose errors with DTaP, Tdap, and combination vaccines (31%); influenza virus vaccines (26%); HepA vaccines (23%); HepB vaccines (7%); and MMRV vaccines (4%).

One example of a recent dosing error involved ongoing confusion between two of the three available HepB vaccines on the market, **ENGERIX-B** (10 mcg/0.5 mL; pediatric) and **RECOMBIVAX HB** (5 mcg/0.5 mL; pediatric). A hospital pharmacy received orders for Engerix-B for newborn infants during a Recombivax HB shortage. While the two brands of the HepB vaccine differ in concentration, the recommended dose in terms of volume is the same (both 0.5 mL for infants, or 10 mcg of Engerix-B and 5 mcg of Recombivax HB). However, the pharmacist, who was more familiar with Recombivax HB (5 mcg/0.5 mL), thought he should only dispense half (0.25 mL) of the vial of Engerix-B (10 mcg/0.5 mL) for each infant's dose to match the 5 mcg dose of Recombivax HB. Subtherapeutic immunization occurred with several dozen infants before the error was recognized. Prior to this, over a 2-year period at a different hospital, 1,400 infants were given a subtherapeutic dose of Engerix-B (5 mcg, 0.25 mL) and were discharged vulnerable to hepatitis B.

Wrong vaccine. Another group of commonly reported vaccine error contributing factors included similar brand and generic names, abbreviations, and vaccine container labels/packaging. These contributing factors most often led to mix-ups between:

- Diphtheria, tetanus, and/or pertussis vaccines (Tdap, DTaP, DT, Td, and combination vaccines) (23%)
- Measles, mumps, rubella, and/or varicella vaccines (MMR [**M-M-R II**], MMRV [**PROQUAD**], and varicella [**VARIVAX**]) (16%)
- Hepatitis A (**HAVRIX** and **VAQTA**), hepatitis B (Engerix-B, Recombivax HB, and **HEPLISAV-B**), and combination vaccines (**TWINRIX** and **PEDIARIX**) (11%)
- Pneumococcal vaccines (**PNEUMOVAX 23** and **PREVNAR 13**) (10%)
- Influenza virus vaccines (**FLUZONE HIGH-DOSE**, **FLUZONE QUADRIVALENT**, **FLUARIX QUADRIVALENT**, and **FLULAVAL QUADRIVALENT**) (9%)

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SAFETY briefs

HIGH-ALERT

Avoid local anesthetics with preservatives for neuraxial use. An anesthesia resident caring for a patient about to undergo a Cesarean-section needed lidocaine 2% with **EPINEPH**rine for an epidural infusion. Lidocaine with **EPINEPH**rine formulations with and without preservatives are currently in short supply. The resident opened an epidural medication box looking for preservative-free lidocaine with **EPINEPH**rine but did not see the familiar vial. He then searched the anesthesia carts and again could not find the proper medication to administer. However, he was able to access an automated dispensing cabinet (ADC) that contained the drug, which was listed on the ADC screen under the patient's name. He retrieved the vial but did not fully read the vial label before administering the epidural infusion. He missed that it was a multiple-dose vial containing methylparaben, a preservative, and was labeled "Not for caudal or epidural use." It is not known how the error in profiling the wrong lidocaine with **EPINEPH**rine formulation occurred.

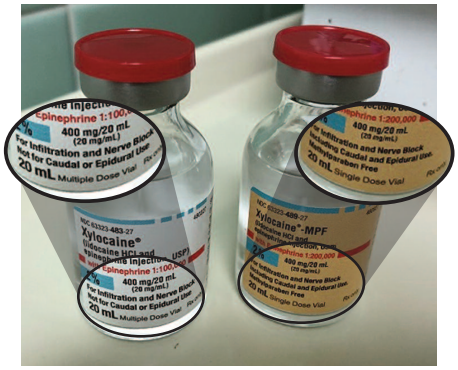

Figure 1. Multiple-dose vial on left contains methylparaben and is not suitable for neuraxial use. Single-dose vial on right is preservative-free and for epidural use.

Possible neurological complications associated with neuraxial use of methylparaben or other preservatives include neurotoxic symptoms, such as transient leg pain or weakness, or even permanent paraplegia and death. Although some reports describe patients who did not develop neurologic sequelae, other cases describe significant morbidity and decreased quality of life (www.ismp.org/ext/32). In the above case, the patient did not develop neurologic toxicity but became hemodynamically unstable, which may not have been related to preservative use. Fortunately, the patient was

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Wrong vaccine errors also continue because the conjugate polysaccharide antigen listed on some vaccine labels is mistaken as the target vaccine name. Vaccines that protect against *Haemophilus influenzae* type b, meningococcal, and pneumococcal infections are typically connected to polysaccharide antigens that trigger the immune

Table 1. Top 10 Vaccines Involved in Reported Errors and their Top Contributing Factors

Vaccine	% of All Vaccine Reports	Top 3 Contributing Factors	
		Contributing Factor	%
HepA *Hepatitis A Vaccine, Inactivated*	11	Age-dependent formulations of same vaccine	30
		Vaccine stored above recommended temperature	16
		Not familiar with dosing of product	11
DTaP-IPV *Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed, and Inactivated Poliovirus*	9	Not familiar with indicated patient ages for product	30
		Age-dependent formulations of same vaccine	19
		Confusion regarding components of the vaccine	6
Influenza Virus *Trivalent, Types A and B*	8	Age-dependent formulations of same vaccine	16
		Similar brand names	11
		Patient chart not checked before administration	9
Tdap *Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Adsorbed*	7	Similar vaccine abbreviations	16
		Similar generic names	13
		Miscommunication of drug order	11
Influenza Virus *Quadrivalent, Types A and B*	6	Age-dependent formulations of same vaccine	33
		Patient age not verified before administration	11
		Similar vaccine container labels/packaging	6
HepB *Hepatitis B Vaccine (Recombinant)*	6	Age-dependent formulations of same vaccine	18
		Patient chart not checked before administration	18
		Similar generic names	6
MMRV *Measles, Mumps, Rubella and Varicella Virus (Live)*	6	Similar vaccine container labels/packaging	21
		Similar vaccine abbreviations	12
		Not familiar with indicated patient ages for product	12
9vHPV *Human Papillomavirus 9-valent vaccine (Recombinant)*	6	Vaccine stored above recommended temperature	41
		Patient chart not checked before administration	13
		Not familiar with vaccination interval for product	6
DTaP *Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed*	5	Routine check for expired products not conducted	16
		Age-dependent formulations of same vaccine	13
		Patient chart not checked before administration	10
DTaP-IPV/Hib *Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed, Inactivated Poliovirus and Haemophilus b Conjugate (Tetanus Toxoid Conjugate)*	5	Not familiar with how to mix or prepare product	18
		Not familiar with indicated patient ages for product	11
		Similar brand names	4

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awake and alert with no complaints of numbness or paresthesia by the next day.

Despite warnings on vial labels, mix-ups have occurred between multiple-dose vials and preservative-free single-dose vials. Look-alike packaging, as well as obscure warnings on the vial containers, contribute to these mix-ups (**Figure 1**, page 2). In some cases, hospital staff may not be aware of the differences, or notice the differences, between these products. Since the preservative-free lidocaine comes in single-dose vials, added risk is encountered unless staff know to discard the vials after patient use.

Consider removing preservative-containing lidocaine products from the labor and delivery area and other areas where use of neuraxial local anesthetics is common (e.g., operating room). Ensure that staff who work in these areas as well as pharmacy staff who stock these areas are aware of the differences between these drugs.

Look-alike lidocaine vials. Due to the shortage of lidocaine, some hospitals have been forced to use products from more than one manufacturer. The problem is the 1% strength of lidocaine from one manufacturer (**Figure 1**) (AuroMedics box at top on right of photo) looks quite like the 2% concentration from another (West-Ward box bottom left of photo). Also, the AuroMedics 2% lidocaine (top left box) looks like West-Ward's 1% lidocaine (bottom right box). The hospital that reported this hazard sent an email to pharmacy staff to make them aware of product similarities. We recommend the use of barcode scanning in the pharmacy to verify the drug. It might also be helpful to use a marker to circle the strengths of each product, although this may not be a feasible alternative and is a much less reliable risk-mitigation strategy than barcode scanning.

Figure 1. AuroMedics 1% strength of lidocaine (box on top right) looks quite like West-Ward's 2% concentration (box on bottom left), and AuroMedics 2% strength (top left) looks like West-Ward's 1% lidocaine (bottom right).

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system to respond. The three common proteins used to conjugate polysaccharide antigens include tetanus toxoid, diphtheria, and meningococcal protein. Including the name of the protein used to conjugate the polysaccharide antigens introduces an opportunity for error. These carrier proteins do not induce immunity to tetanus, diphtheria, or meningococcal disease; however, the presence of these words has inferred protection and led to mix-ups.

In one recent example, a medical assistant administered a *Haemophilus* b conjugate vaccine (**PEDVAXHIB**) instead of the prescribed meningococcal vaccine (**MENACTRA**) because the PedvaxHIB vaccine label displayed "[Meningococcal Protein Conjugate]" sandwiched between the unbracketed vaccine generic name, "*Haemophilus* b Conjugate Vaccine" and the brand name, using the same font type, color, and size. Similar errors in the past have involved the *Haemophilus influenzae* type b vaccines **HIBERIX** and **ACTHIB**, which are tetanus toxoid conjugates; and the other meningococcal vaccine **MENVEO** and the pneumococcal vaccine Prevnar 13, which are diphtheria conjugates.

Wrong vaccine interval errors. More than half (53%) of all vaccine interval errors were associated with not checking the patient's chart to confirm the date of the prior vaccine. Additional contributing factors for this type of error included lack of documentation of the prior vaccination in either the patient's medical record or the vaccine registry (23%), miscommunication of vaccine orders and ambiguous due dates (16%), and unfamiliarity with vaccine intervals (16%). One error report described an event related to a confusing registry report that did not distinguish between vaccine doses due on the day of the clinic visit and doses due at some point in the future, leading to early administration of a HepA vaccine.

The vaccines most frequently involved in wrong interval errors included those that target diphtheria, tetanus, and/or pertussis (26%), HepB (21%), HepA (15%), and the human papillomavirus vaccine 9vHPV (**GARDASIL 9**) (9%). Some of the reported timing-related vaccine errors can be attributed to the complex Centers for Disease Control and Prevention (CDC) immunization schedules as well as individualized catch-up vaccine schedules, particularly when parents want to alter the CDC-recommended vaccine schedule for their children.

Unnecessary or duplicate vaccinations, omissions, and wrong patient errors. Not checking the patient's chart or vaccine registry were also selected as common contributing factors associated with duplicate vaccines, omissions, and wrong patient errors, particularly with vaccines that target diphtheria, tetanus, and/or pertussis (34%); influenza virus vaccines (16%); HepA (10%); MMRV (6%); and HepB (6%). Some duplicate doses were administered because the provider inadvertently administered two vaccines containing overlapping components. For example, there were several reports involving the administration of both MMRV and MMR. Reports also noted that numerous patients received a combination vaccine when only one component was needed (e.g., MMRV instead of Varivax alone), or received a single vaccine already contained in a combination vaccine given at the same time (e.g., MMRV and Varivax). Giving just one component instead of the combination vaccine was also reported.

Administering diluents without the active vaccine components or administering one component of two-component vaccines is another type of vaccine omission reported. There are about a dozen vaccines that require reconstitution with specific diluents. Errors have involved administration of a product's diluent alone, particularly for ActHIB, Varivax, and **ZOSTAVAX** (zoster vaccine). Also, several vaccines are provided in two-component containers that must be mixed prior to administering the dose. These include an active liquid component that must be used to reconstitute an active powder component. Errors have been reported in which only one component

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No read back of verbal orders and overlooked alerts. Drug level monitoring in a transplant patient showed low blood levels of sirolimus. During a clinic care meeting, the transplant team decided to make a small incremental increase in the sirolimus dose along with an increase in the accompanying dose of azaTHIOprine from 150 mg daily to 200 mg a day. However, a nurse taking notes during the meeting did not repeat back the verbal drug orders and erroneously documented the change in the azaTHIOprine dose to 200 mg BID, not daily.

As the nurse entered the azaTHIOprine order into the computer system as 200 mg BID, a high-dose alert flashed on the screen. But the nurse quickly pressed a key to move past the alert, believing that transplant medication doses are often high. The pharmacist verifying the order also received a high-dose alert and overrode it. Just like the nurse, her rationale for overriding the alert was that transplant patients sometimes have unusual immunosuppressant drug doses. The patient received the BID dosing of azaTHIOprine for about 5 weeks.

Surprisingly, there were many opportunities where the erroneous BID frequency could have been intercepted. During the 5 weeks following the error, the patient required an emergency department (ED) visit and two hospitalizations. During medication reconciliation at each encounter, practitioners assumed that another clinician had verified the dose and frequency. During the most recent hospitalization, the patient required admission to an intensive care unit due to pancytopenia. It is assumed, but not proven, that the overdose of azaTHIOprine played a role.

The hospital initially considered suppressing the ability to enter BID dosing for azaTHIOprine, but twice daily dosing is a common frequency when using the drug to treat rheumatoid arthritis, and the computer system was unable to distinguish dosing frequencies based on indication, at least not during order entry. One of the primary causes of the error stems from the prescriber's failure to enter the order himself. The error might have been prevented if the prescriber had entered the order directly into the computer during the clinic care meeting, instead of relying on nurses to doc-

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of the two-component vaccine was administered.

Most (77%) of the reported errors of this type involved **PENTACEL**, which is supplied in two vials, one containing the DTaP-IPV liquid component, and another containing the Hib lyophilized powder component. The active liquid component of the vaccine alone was administered without first mixing it with the active lyophilized powder component. Similar errors have been reported with Menveo. The most frequently reported contributing factors associated with these events included unfamiliarity with mixing and preparing the vaccines (46%) and misleading or similar cartons and containers (15%).

Although wrong patient errors were reported infrequently, preparation of different vaccines or different age-formulations of the same vaccine for more than one patient was most often a contributing factor, particularly when treating multiple patients in the same treatment room. Some of these events also involved unlabeled syringes. In one case, a 15-month-old child received an adult influenza vaccine, and his father received the pediatric influenza vaccine, when both vaccines were prepared and brought into the treatment room for administration. Many of the other wrong patient errors were associated with sibling confusion in which one child received a vaccination intended for another sibling in the same treatment room. However, some of these events were categorized as wrong dose errors if the wrong formulation (adult or pediatric) of the correct vaccine was administered to the wrong sibling.

Contamination, deterioration, and expiration of vaccines. Most of the reports of vaccines kept outside proper storage temperatures were submitted in clusters from single facilities that had experienced an unintended temperature excursion with a batch of available vaccines. More than half (57%) of these reports involved Gardasil 9 (9vHPV), Havrix (HepA), and **BEXSERO** (MenB-4C), which all require refrigeration. Expired vaccines were discovered after administration, usually upon documentation.

Conclusion

Although we have learned important information from the error reports submitted to the ISMP VERP, analysis of the 2017 data differs little from previous years' analyses. Therefore, we plan to take all that we have learned about vaccine errors from our reporting program between 2012 and 2017 and provide recommendations in **Part II** of this newsletter feature to help providers prepare for immunization initiatives in hospitals and ambulatory clinic settings. **Part II** will appear in our *June 28, 2018* newsletter. While not inclusive of all preparations required for immunization initiatives, these recommendations will be responsive to the specific types of errors reported to the ISMP VERP. We plan to include a checklist of error-prone topics and prevention strategies to cover with staff who will be administering vaccines. The tips will also help facilities evaluate their vaccine practices and staff training programs, even if a targeted immunization initiative is not being planned.

ISMP INSTITUTE FOR SAFE MEDICATION PRACTICES

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Report medication and vaccine errors to ISMP: Please call 1-800-FAIL-SAF(E), or visit our website at: www.ismp.org/MERP or www.ismp.org/VERP. ISMP guarantees the confidentiality of information received and respects the reporters' wishes regarding the level of detail included in publications.

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ument verbal orders and later enter them into the computer. Failing to read back verbal drug orders to ensure accuracy and respond appropriately to electronic dose alerts were also contributing factors. A review of current alert management could enhance the value and attention paid to critical dose alerts. At any point, had just one individual contacted a transplant team member about the unusual azaTHIOprine dose and frequency, the error might have been detected.

Although indication-based prescribing may not be possible at this time (www.ismp.org/node/190), requiring a hard stop verification of an appropriate rheumatoid arthritis indication for all BID dosing of azaTHIOprine may prevent errors. If this is not possible, consider adding a comment to the azaTHIOprine screen during order entry that states, "AzaTHIOprine should NOT be dosed more frequently than DAILY except for rheumatoid arthritis indications."

Special Announcements

Accepting Cheers Awards nominations

Nominations for this year's Cheers Awards will be accepted through **September 7, 2018.** Outside and self-nominations are accepted. The prestigious awards spotlight efforts to improve medication safety from all healthcare disciplines. To submit a nomination, visit: www.ismp.org/cheers-awards.

Free FDA webinar series

The US Food and Drug Administration's (FDA) Division of Drug Information is presenting the next in a series of free educational webinars for healthcare professionals, **FDA Drug Topics: Risk Evaluation and Mitigation Strategies (REMS)**, on **June 26**. This webinar will introduce healthcare professionals to web resources about REMS, including a REMS resource portal and the REMS@FDA website, and will focus on what type of information is available, where, and how to navigate these resources. Continuing education (CE) credit is available. For details, visit: www.ismp.org/ext/30, and to register for the program, visit: www.ismp.org/ext/31.

ISMP Survey on High-Alert Medications in Acute Care Settings

Please complete our short survey on high-alert medications in acute care settings and submit your responses to ISMP by **July 31, 2018**, by visiting: www.ismp.org/ext/28. High-alert medications bear a heightened risk of causing significant patient harm when they are used in error. Although errors may or may not be more common with these medications, the consequences of an error are often devastating to both patients and their healthcare providers.

1 Does your organization maintain a list of high-alert medications?

☐ Yes ☐ No (skip to question 5) ☐ Don't know (skip to question 5)

2 Does your organization have special precautions in place for the high-alert medications on your list?

☐ Yes, for all high-alert medications on the list
☐ Yes, for most high-alert medications on the list
☐ Yes, for some high-alert medications on the list
☐ No, not for any high-alert medications on the list (skip to question 4)
☐ Don't know (skip to question 4)

3 Overall, how effective are the special precautions in place for high-alert medications in minimizing risk and preventing errors?

☐ Very effective ☐ Mostly effective ☐ Somewhat effective ☐ Weakly effective ☐ Not at all effective

4 For which three high-alert medications or classes of medications on your list are you most concerned about errors?

1) _____ 2) _____ 3) _____

5 Please review the ISMP List of High-Alert Medications in Acute Care Settings (below). You can also view the complete list, with subcategories and examples, at: www.ismp.org/node/103. Are there any medications or classes of medications on the list that you do NOT consider high-alert medications?

☐ No, I consider all medications on the list to be high-alert medications ☐ Don't know
☐ Yes, there are one or more medications on the list that I do **NOT** consider a high-alert medication (please specify): _____

Classes/Categories of Medications	Specific Medications
adrenergic agonists, IV	**EPINEPH**rine, subcutaneous
adrenergic antagonists, IV	epoprostenol (Flolan), IV
anesthetic agents, general, inhaled and IV	insulin U-500 (special emphasis)
antiarrhythmics, IV	magnesium sulfate injection
antithrombotic agents	methotrexate, oral, non-oncologic use
cardioplegic solutions	opium tincture
chemotherapeutic agents, parenteral and oral	oxytocin, IV
dextrose, hypertonic, 20% or greater	nitroprusside sodium for injection
dialysis solutions, peritoneal and hemodialysis	potassium chloride for injection concentrate
epidural or intrathecal medications	potassium phosphates injection
hypoglycemics, oral	promethazine, IV
inotropic medications, IV	vasopressin, IV or intraosseous
insulin, subcutaneous and IV	
liposomal forms of drugs	
moderate sedation agents, IV	
moderate sedation agents, oral, for children	
narcotics/opioids, IV, transdermal, oral	
neuromuscular blocking agents	
parenteral nutrition preparations	
radiocontrast agents, IV	
sterile water for injection, inhalation, and irrigation (excluding pour bottles) in containers of 100 mL or more	
sodium chloride for injection, greater than 0.9% concentration	

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> Survey—continued from page 6

6 **Please review the following short list of possible additions to the ISMP List of High-Alert Medications in Acute Care Settings and tell us whether you believe each should be added to ISMP's list or changed. Also tell us if you have any additional suggestions for the list.**

Medication or class	Yes	No	Don't know	Comments
Concentrated sodium chloride oral solution 23.4% (234 mg/mL) (used as an additive for enteral feedings/formulas)				
Antidiabetic agents, oral and injectable (e.g., exenatide, liraglutide, dulaglutide, pramlintide), to replace oral hypoglycemics				
Promethazine injection (e.g., IM and IV), to replace promethazine IV				
Other additions (please specify):				

7 **Please select the categories that best describe your profession, current position, and work setting.**

Profession: ☐ Nurse ☐ Pharmacist ☐ Prescriber ☐ Pharmacy technician ☐ Other:_____

Position: ☐ Staff ☐ Manager/Director ☐ Administrator ☐ Other (please specify): _____

Work setting: ☐ Adult critical care ☐ Pediatric/neonatal critical care ☐ Adult non-critical care ☐ Pediatric/neonatal non-critical care
☐ Oncology ☐ Emergency department ☐ Anesthesia/operating room ☐ Outpatient center
☐ Pharmacy (inpatient) ☐ Pharmacy (outpatient) ☐ Other (please specify): _____