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ISMP
An ECRI Institute Affiliate

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

Errors associated with oxytocin use: A multi-organization analysis by ISMP and ISMP Canada

PROBLEM: Intravenous (IV) oxytocin used antepartum is indicated to induce labor in patients with a medical indication, to stimulate or reinforce labor in selected cases of uterine inertia, and as an adjunct in the management of incomplete or inevitable abortion. Used postpartum, IV oxytocin is indicated to produce uterine contractions during expulsion of the placenta and to control postpartum bleeding or hemorrhage. However, improper administration of oxytocin can cause hyperstimulation of the uterus, which in turn can result in fetal distress, the need for an emergency cesarean section, or uterine rupture. Sadly, a few maternal, fetal, and neonatal deaths have been reported.

In October 2019, ISMP Canada published a multi-incident analysis[1] to identify opportunities to improve the safe use of this high-alert medication. A total of 144 reports of incidents associated with oxytocin were analyzed from voluntary reports submitted to ISMP Canada and the Canadian National System for Incident Reporting (NSIR) between 2000 and 2019. Maternal, fetal, or neonatal harm was reported in 12% of the oxytocin reports to ISMP Canada and 29% of the oxytocin reports to NSIR. Most of the incidents reported in both data sets occurred during drug administration.

In February 2020, ISMP analyzed an additional 52 voluntary reports associated with oxytocin submitted to the ISMP National Medication Errors Reporting Program (ISMP MERP) between 1999 and 2019. About 10% of the reports described more than one oxytocin error that had occurred. About 44% of the reported events originated during dispensing, with many relating to mix-ups between oxytocin and look-alike product vials. About a quarter (23%) originated during administration, and 13% during prescribing. Overall, about 8% of the reports were hazards that did not result in errors. A quarter (25%) of all events resulted in maternal, fetal, or neonatal harm.

Analysis of the 144 incidents reported to ISMP Canada and NSIR revealed 3 main themes, some with multiple subthemes. Analysis of the 52 reports submitted to ISMP revealed similar themes along with a few additional themes. The five themes from both ISMP Canada and ISMP analysis of oxytocin incidents are presented below.

THEME 1 PRESCRIBING ERRORS

Selection of wrong drug on order entry screen. Oxytocin errors related to prescribing were associated with selecting the wrong drug from a computerized prescriber order entry (CPOE) screen when searching using only 3 letters, "PIT," "OXY," or "OXY10." Most recently, two errors were reported in which physicians had entered "PIT" for **PITOCIN** (oxytocin) in the CPOE system but accidentally selected **PITRESSIN** (discontinued brand name for vasopressin still found in some CPOE systems). When entering "OXY10" into the CPOE system, the following error occurred:

*A physician intended to prescribe oral **OXYCONTIN** (oxy**CODONE**) 10 mg every 12 hours as needed for pain for a postpartum patient. He entered "OXY10" into the CPOE search field but accidentally selected "oxytocin 10 units IV" from the menu, resulting in an order for oxytocin 10 units IV every 12 hours as needed for pain. The pharmacist was concerned about the order but dispensed the medication as prescribed*

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Now Available from ISMP:

Expanded Smart Pump Guidelines

We have just released revised and expanded ***Guidelines for Optimizing Safe Implementation and Use of Smart Infusion Pumps*** to provide strategies for addressing potential barriers and integrating this technology with other electronic systems. The expanded guidelines cover a broad scope of smart infusion pump usage in both inpatient and ambulatory settings, including perioperative, procedural, and radiology locations. The expanded guidelines also include recommendations to employ smart infusion pumps with dose error-reduction systems for plain IV fluid infusions. Also, there is a new set of guidelines associated with bi-directional smart pump interoperability with the electronic health record. For recommendations on reducing risks involving infrastructure, drug libraries, continuous quality improvement data, clinical workflow, and interoperability, visit: www.ismp.org/node/972.

SAFETY briefs

Problems with containers with dual linear barcodes. We received a report about nurses scanning the wrong barcode on B. Braun Duplex containers of ceFAZolin injection (**Figure 1**). These and other B.

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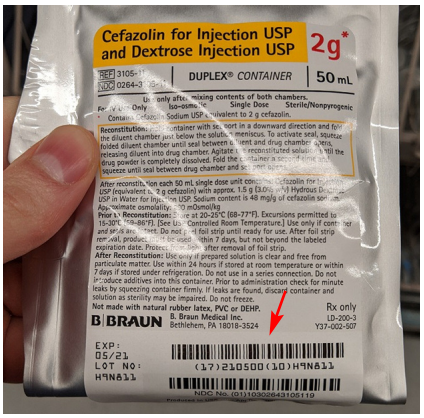

Figure 1. Nurses are confusing the two linear barcodes on B. Braun Duplex containers.

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because the nurse was waiting for the medication. The nurse also questioned the pharmacist about the order, stating that she had never given a patient "IV oxytocin" to treat pain. But by the time the pharmacist followed up with the prescriber and corrected the error, the patient had received one dose of IV oxytocin.

THEME 2 LOOK-ALIKE DRUG PACKAGING AND NAMES

Look-alike vials. Not unexpected, 40% of all oxytocin-related reports submitted to ISMP described look-alike vials that had led to, or could have led to, mix-ups between oxytocin and another product. The most common, recent reports involved both generic (oxytocin) and brand (Pitocin) vials (10 units/mL) that looked similar to ondansetron vials (4 mg/2 mL) from various manufacturers. The oxytocin/Pitocin and ondansetron vials are available in similar sized, clear vials with green caps (and sometimes green lettering on both labels). The risk of a mix-up between these products is heightened because they are often stored alphabetically near each other on pharmacy shelves and used for the same patient population, especially during cesarean sections. In some cases, a shortage of ondansetron was a factor requiring purchase of an available product from a different manufacturer in vials that looked similar to oxytocin/Pitocin vials. Many of the reported errors involved dispensing or stocking automated dispensing cabinets (ADCs) with the wrong product. Reports of other medications packaged in vials that look similar to oxytocin/Pitocin within the past 5 years included clindamycin and metoclopramide.

Look-alike drug names. About 12% of oxytocin errors reported to ISMP described name confusion between Pitocin and Pitressin, a long-discontinued brand of vasopressin originally manufactured by Parke-Davis (now a division of Pfizer). While some of these reports were received more than a decade ago, errors have persisted because vasopressin is sometimes still referred to as "PIT" or "Pitressin," and the drug name can still be found in some order entry systems (see **THEME 1**). Most of the reported errors involved verbal orders or requests to the pharmacy for "Pitressin" that were misheard as Pitocin. The few errors in which "Pitressin" infusions were dispensed instead of the intended Pitocin infusion resulted in harm (e.g., pulmonary edema).

THEME 3 PREPARATION CHALLENGES

Preparation and/or labeling problems. Nurses may prepare oxytocin infusions on the patient care unit, just before use, by withdrawing the medication from a vial and adding the appropriate volume to a bag of IV solution (e.g., 0.9% sodium chloride). The diluted solution is then administered IV via an infusion pump. Nursing admixture on a patient care unit risks sterility and preparation errors. Also, if a nurse-prepared IV infusion bag is not labeled legibly, completely, and accurately, it can be indistinguishable from bags containing plain IV solutions. This multi-organization analysis highlighted cases in which incomplete or omitted labels on nurse-prepared infusions led to patient safety issues. These labeling problems were typically due to interruptions, distractions, or competing priorities on the patient care unit.

An unlabeled bag of what was presumed to be a plain IV solution was administered to a patient. Staff later noted maternal cramping and fetal heart rate deceleration. An investigation revealed that the bag contained oxytocin. The patient required an emergency cesarean section.

THEME 4 ADMINISTRATION-ASSOCIATED ERRORS

Infusion pump or IV line mix-ups. Mix-ups of IV lines and misconnections to the wrong infusion pump have resulted in drug or dose errors and omissions. Contributing factors included the need for multiple IV lines, a fast-paced work environment, heavy workload, failure to trace lines, inexperienced staff, and distractions.

During augmentation of labor, IV oxytocin was to be administered at a controlled, prescribed rate via an infusion pump, while IV Lactated Ringer's was to be administered

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Braun Medical intravenous (IV) products, including large volume parenteral IV bags, have two linear barcodes. For ceFAZolin Duplex containers, the uppermost linear barcode is for scanning the lot number and expiration date, although it isn't clear if hospitals can take advantage of this barcode. (Please email ISMP at ismpinfo@ismp.org to tell us whether you routinely scan this barcode for lot number and/or expiration date so we have a sense of how often the barcode is used.) The barcode beneath this one is most essential, since it contains the national drug code (NDC) number for product identification, as required under the US Food and Drug Administration (FDA) Bar Code Rule.

When an unsuccessful scan occurs, it may happen because the nurse scans the wrong barcode or because the scanner hits and "reads" the uppermost barcode first, then sounds an alarm since this is not used for product identification. The person who reported the issue mentioned that scanning errors are a frequent occurrence at his hospital, which has led to nurse alert fatigue, time-consuming calls to the pharmacy, and delays in medication administration.

We have been in touch with B. Braun to suggest moving the barcode to another location, far away from the product identification barcode. Better yet, we suggested replacing the uppermost barcode with a 2D barcode. FDA allows a 2D barcode for this purpose (lot number and expiration date), if a linear barcode is still there for the NDC number as required by the FDA Bar Code Rule. Perhaps a 2D barcode could replace the uppermost linear barcode currently encoding the lot number and expiration date. If scanners can read a 2D barcode, they would be able to identify the drug as well as detect the lot number and expiration date in one scan. B. Braun agreed to look into the situation.

Meanwhile, if you are not using the lot number and expiration date linear barcode, it may be best to completely block out that barcode on the Duplex container label with a marker to direct nurses to the correct barcode to scan for product identification. Otherwise, it will take time to educate pharmacy and nursing staff about the proper way to scan these containers.

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rapidly via gravity. During the set-up process, the lines were mixed up, and the oxytocin solution was inadvertently left to run freely without a pump. As a result, the patient received a larger-than-intended dose of oxytocin, an error that led to the need for a cesarean section.

Infusion bag swaps. Similar to line mix-ups, numerous errors were reported in which an oxytocin infusion bag was mixed up with either a hydrating fluid or magnesium infusion, leading to significant under- or overdoses. A common contributing factor included availability of an oxytocin infusion during labor that was intended for use postpartum.

For a laboring mother who was progressing well, a nurse selected what she thought was an infusion bag containing 500 mL of Lactated Ringer's but was actually oxytocin (30 units/500 mL). The mother received an unspecified amount of oxytocin prior to delivery at an infusion rate normally used for hydrating fluids. The oxytocin infusion had been prepared for use after delivery and had been brought into the labor room by a second nurse. Shortly after oxytocin administration began, the mother's contractions intensified, and fetal monitoring demonstrated significant heart rate decelerations. The baby was delivered as soon as possible and had a low Apgar score without spontaneous breathing, requiring admission to the neonatal intensive care unit.

Failure to scan the barcode on the infusion bag, often due to a sense of urgency, was another contributing factor.

After a precipitous birth, a mother was prescribed a bolus dose and continuous infusion of oxytocin to alleviate postpartum bleeding. A nurse quickly gathered what she thought was an oxytocin infusion but did not scan the bag's barcode prior to hanging the infusion. An hour after starting the infusion, the mother experienced hypotension, weakness, and vomiting and was given a dose of IV ondansetron. Later, when the nurse was hanging a replacement bag of oxytocin, she noticed that the initial infusion bag contained magnesium (20 g/500 mL), not oxytocin (30 units/500 mL). The mother's magnesium toxicity was treated with IV calcium gluconate with improvement in symptoms.

Infusion rate confusion. Inconsistent terminology used to express an oxytocin infusion rate in the medication order, administration record, and/or pump library led to several errors. The concentration of oxytocin in an IV infusion solution is usually expressed in milliunits per mL or units per L. The administration rate for the solution is typically expressed as the amount of drug (milliunits/minute) and as the volume of solution to be infused (e.g., mL/hour). As a result of confusion between the units of measure, infusion pump programming errors were made, which resulted in the delivery of more than the intended dose of oxytocin.

Inadvertent bolus doses from leftover drug in tubing. One reported event reminded us how residual oxytocin (or other drugs) in IV tubing can have severe adverse effects when other medications or infusions are administered through the same line. If IV lines are not changed, the length of the IV tubing may contain 10 mL or more of uninfused drug. Additionally, needleless ports and stopcocks also have dead space where the drug can accumulate.

Residual oxytocin left in an obstetrical patient's IV line caused hypertonic, tetanic uterine contractions leading to deceleration of the fetal heart rate and fetal hypoxia, when a Lactated Ringer's hydrating solution was rapidly infused through the same IV line.

THEME 5 COMMUNICATION GAPS

Incomplete hand-offs at transitions of care. The lack of clear communication and/or documentation during transitions of care was a key contributor to oxytocin incidents. Reporters attributed poor communication/documentation to heavy workload, a fast-paced environment, inexperience, and involvement of many individuals in the patient's care.

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Be prepared for coronavirus. ECRI Institute recently launched a **Coronavirus Outbreak Preparedness Center** to provide infection control and outbreak preparedness resources for hospitals and healthcare providers (www.ismp.org/ext/345). While most facilities may have adequate supplies of goggles, masks, and gowns on hand for emergencies and infectious outbreaks, shortages may occur. Immediate steps should be taken to assess preparedness to handle this crisis. The ECRI Institute website provides extensive information that aims to help hospitals protect healthcare workers as well as patients. It includes preparation and patient handling checklists; equipment and alternative supplier lists; patient care equipment evaluations, including portable ventilators; recommendations for infection control; and links to the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO). This compendium of resources is freely available to the public. The site will be updated as newer information becomes available. ISMP is an ECRI Institute affiliate.

HIGH-ALERT

Rocuronium peel-off label shows amount per mL not per vial. When checking a rapid sequence intubation kit, a pharmacist noticed that the strength expressed on rocuronium 5 mL vials from Fresenius Kabi had changed from the usual 50 mg/5 mL to 10 mg/mL. Upon closer inspection, the pharmacist realized that the manufacturer had added a peel-off label noting 10 mg/mL over the actual vial label that states 50 mg/5 mL (**Figure 1**). During a busy intubation scenario, someone might mistake the vial as containing a total of 10 mg, not 50 mg.

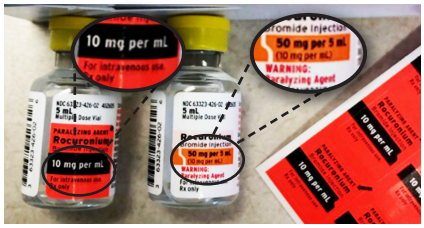

Figure 1. Vial on left contains 50 mg/5 mL but the peel-off overlay states 10 mg per mL, which may be confused as the total amount in the vial. Vial on right has the peel-off label removed. Additional peel-off labels are included in vial cartons.

The peel-off label is meant to be removed from the vial label and attached to a syringe once the drug has been drawn up. The pharmacy is now removing the 10 mg/mL peel-off label before dispensing the vials.

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Administration of oxytocin was put on hold when staff noted a deceleration in the fetal heart rate. Fifteen minutes later, the physician examined the patient and gave a verbal order to restart the oxytocin infusion, but at a lower rate. A few minutes later, a second physician, who was taking over for the first, gave an order to restart the oxytocin at the original dose. The lack of documentation regarding the decision to lower the rate of infusion was considered to be a factor in this incident.

Safe Practice Recommendations: Form an interdisciplinary team and consider the following recommendations as you plan, implement, and monitor the effectiveness of strategies to mitigate the risk of oxytocin errors and associated maternal, fetal, or neonatal harm.

Increase the number of drug name letters required in electronic searches. ISMP recommends requiring a minimum of 5 letters when searching for a drug name in electronic systems (see #19 in the ***ISMP Guidelines for Safe Electronic Communication of Medication Information***, www.ismp.org/ext/329), resulting ideally in only one drug name appearing in the results field. Indication-based prescribing could also support the correct selection and appropriate use of medications.

Employ standard order sets. Require the use of standard order sets for prescribing oxytocin antepartum and/or postpartum that reflect a standardized clinical approach to labor induction/augmentation and control of postpartum bleeding. Include administration requirements, patient monitoring, standard treatment of oxytocin-induced uterine tachysystole,[2] and other safety measures. (Use of standard order sets will also reduce drug selection errors during prescribing.)

Standardize concentration/bag size. Standardize to a single concentration/bag size for both antepartum and postpartum oxytocin infusions (e.g., 30 units of oxytocin in 500 mL of Lactated Ringer's[2,3]).

Provide oxytocin in ready-to-use form. Provide patient care units with ready-to-use IV bags of oxytocin in a standardized concentration that are pharmacy-prepared or from an outsourced sterile compounding service to avoid the need for drug manipulation at the bedside. Before distribution of the bags to patient care units, boldly label both sides of the bags to differentiate them from plain hydrating solutions and magnesium infusions. If oxytocin infusions must be prepared on patient care units during an emergency, require an independent double check of the preparation and provide preprinted labels to affix to prepared bags.

Standardize dosing units. Standardize how oxytocin doses, concentrations, and rates are expressed. Always communicate orders for oxytocin infusions in terms of the dose rate (e.g., milliunits/minute) to lessen the opportunity for misinterpretation. Align oxytocin dosing units and concentration with the smart pump dose error-reduction system.

Employ barcode scanning technology. Despite a fast-paced environment of care, require the scanning of barcodes on oxytocin vials and infusion bags prior to preparation, dispensing, stocking (e.g., in ADCs), and administration to help ensure that the right product has been selected.

Use smart infusion pumps. Deliver all IV oxytocin via smart infusion pumps with an engaged dose error-reduction system. Bi-directional smart pump interoperability with the electronic health record will also reduce the risk of programming errors.

Label and trace lines. Label the IV tubing on oxytocin infusions just above the injection port closest to the patient and just above the pump. When setting up an infusion, trace the line from the infusion bag to the pump, and from the pump to the

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We previously described this problem in our October 18, 2018 newsletter, and our July 26, 2018 newsletter mentioned a similar situation with peel-off labels on **BRIDION** (sugammadex) vials that indicate the per mL concentration instead of the amount per volume in the vial. The peel-off labels are now included separately in packaging.

Of note, Fresenius Kabi also includes additional peel-off labels in the carton with the rocuronium vials, so the label on the vial is not necessary. We contacted Fresenius Kabi, and the company is going to remove the peel-off label from the vial. They will continue to include the peel-off labels separately in the carton. We appreciate their response.

Unsafe product labeling. Teva's 5 mL haloperidol decanoate injection lists the drug strength, 50 mg/mL, on the outer carton as well as the immediate container label. However, the strength should be listed as 250 mg/5 mL (50 mg/mL), as required in USP <7>. The label indicates that the product is a 5 mL multiple-dose vial, but that information is easily missed since it is located apart from the 50 mg/mL expression in a smaller font (**Figure 1**). This almost led to a dispensing error at one hospital, when a pharmacy technician was about to refill an automated dispensing cabinet (ADC) pocket intended for a 50 mg vial of haloperidol decanoate with a 250 mg vial. In this case, the barcode was scanned, which identified that the vial contained the wrong amount of drug. For safety reasons, if a 250 mg vial is needed, purchase it from a different manufacturer until Teva's labeling is updated using the proper format for listing the concentration.

Figure 1. Teva's 1 mL vial on the left contains 50 mg of haloperidol, while the 5 mL vial on the right contains a total of 250 mg despite its error-prone expression of 50 mg/mL.

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patient (and/or vice versa), to ensure the correct line attachment. Independent double checks can be used to verify the setup of IV lines.

Conduct vial/infusion bag packaging assessment. Prior to use (or purchase) of medication vials or premixed infusion bags, conduct an assessment to ensure they do not look similar to other vials or bags used in the facility and that the label is clear regarding the amount of drug per total volume. This process should occur even for a drug that is used temporarily during a drug shortage or other reason. If similarities are noticed, and the drug/solution cannot be purchased from a different manufacturer/supplier, implement strategies to avoid confusion (e.g., auxiliary labeling on vials, infusion bags, bins, ADC screens) and warn all users about the risk.

Store separately. Separate the storage of look-alike oxytocin and ondansetron vials (and other look-alike vials) in the pharmacy and patient care storage locations. Try to obtain one of the products from a different manufacturer and utilize barcode scanning.

Reduce access to unneeded medications. Whenever possible, avoid bringing any medication or solution to the patient's bedside until it is prescribed and needed. Restricting access to unneeded medications is a key error-reduction strategy, particularly in birthing units where emergent circumstances may require rapid changes in the plan of care.

Avoid outdated brand names and drug name abbreviations. Remove outdated brand names, including Pitressin, from CPOE systems. Avoid using abbreviations such as "PIT" for either Pitocin or Pitressin or "OXY" for oxytocin or oxy**CODONE**/Oxy**CONTIN**.

Limit verbal orders. Limit verbal orders to emergencies or under sterile conditions. When they are needed, readback (or repeat back under sterile conditions) is a must.

Discard discontinued bags and change oxytocin tubing. When an oxytocin infusion is discontinued, promptly remove and discard any unused portion of the infusion and change the IV line to ensure no residual drug is left in the tubing.

Support clear communication/documentation. Use standardized communication strategies (e.g., SBAR) and documentation tools during transitions of care to promote clear, timely, and efficient exchange of patient information.

Engage patients. Encourage questions about oxytocin to further engage patients/families in the birth planning process.

References

1) ISMP Canada. Errors associated with oxytocin use: a multi-incident analysis. *ISMP Canada Safety Bulletin*. 2019;19(8):1-5. www.ismp.org/ext/342
2) Simpson KR, Knox GE. Oxytocin as a high-alert medication: implications for perinatal patient safety. *MCN Am J Matern Child Nurs*. 2009;34(1):8-15.
3) McKenna DS, Rudinsky K, Sonek J. Effects of a new patient safety-driven oxytocin dosing protocol on postpartum hemorrhage. *J Pregnancy*. 2014;2014:157625. www.ismp.org/ext/347

ISMP thanks ISMP Canada for providing the analysis of oxytocin events reported in Canada.[1]

Special Announcements

ISMP programs available for industry

ISMP conducts 1- or 2-day educational programs for the pharmaceutical industry about medication safety and error prevention. These highly rated programs provide a deep understanding of how system-based errors occur and how risks associated with user error can be minimized through safe product naming, labeling, packaging, and application of human factors concepts. ISMP faculty provide industry learners with an understanding of medication safety issues in both acute and ambulatory care settings by practitioner types, drug distribution systems, and associated technologies such as barcoding, smart infusion pumps, and automated dispensing cabinets. Safety issues are brought to life through case presentations taken from the ISMP National Medication Errors Reporting Program. Relevant USP standards and US Food and Drug Administration (FDA) guidance documents are presented, and discussions are held about domestic and international organizations dedicated to the advancement of medication safety. These programs may be held at ISMP (Horsham, PA) or company headquarters, tailored to company needs, and involve industry health and regulatory professionals. For more information, please contact: ismpinfo@ismp.org.

FREE FDA webinar

The US Food and Drug Administration's (FDA) Division of Drug Information is presenting a **FREE** webinar on February 18, ***FDA Drug Topics: FDA Drug Information Resources and Applicability to Health Care Professionals***. This webinar will describe drug information resources on the FDA website for safety issues such as drug shortages and recalls, adverse event reporting, and product labeling. Continuing education credit is available. For details, visit: www.ismp.org/ext/30, and to register, visit: www.ismp.org/ext/31.

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ISMP Safe Medication Management Fellowships

ISMP is now accepting applications for three unique **Fellowship** programs commencing in **2020**

ISMP Safe Medication Management Fellowship

Location and Term: This 12-month Fellowship commences July/August 2020 at the Horsham, Pennsylvania (near Philadelphia) office of ISMP. Relocation to the Horsham/Philadelphia area is required.

Description: Now in its 28th year, this Fellowship offers a **nurse, pharmacist, or physician with at least 1 year of postgraduate clinical experience** an unparalleled opportunity to work collaboratively with the nation's experts in medication safety to assess and develop interdisciplinary medication error-prevention strategies. This Fellowship is open to US citizens (or applicants with a valid US visa).

FDA/ISMP Safe Medication Management Fellowship

Location and Term: This 12-month Fellowship commences August/September 2020. The Fellow will spend 6 months at the Horsham, Pennsylvania (near Philadelphia) office of ISMP and 6 months at the Silver Spring, Maryland (near Washington, DC) office of the US Food and Drug Administration (FDA). Relocation to the Horsham/Philadelphia and Silver Spring/Washington, DC, area is required.

Description: This Fellowship, open to a **healthcare professional with at least 1 year of postgraduate clinical experience**, is a joint effort between ISMP and FDA's Center for Drug Evaluation and Research, Office of Surveillance and Epidemiology, Division of Medication Error Prevention and Analysis. The Fellowship allows the candidate to benefit from ISMP's years of medication safety experience along with FDA's valuable regulatory experience focused on medication error prevention.

ISMP International Medication Safety Management Fellowship

Location and Term: This 12-month Fellowship commences July/August 2020 at the Horsham, Pennsylvania (near Philadelphia) office of ISMP. Relocation to the Horsham/Philadelphia area is required.

Description: This Fellowship, open to a **healthcare professional with an advanced degree and at least 1 year of experience in an acute care setting**, will help train a medication safety leader seeking a long-term career at an international level. The Fellow will be involved in global medication safety initiatives, address worldwide safety issues, and help increase global reporting of medication errors. All applicants must be **fluent in written and spoken English and be a US citizen or gain official documentation** to remain in the US for the duration of the Fellowship and to travel internationally.

A competitive stipend is provided with all Fellowship programs.

How to Apply

Information and an application can be found at: www.ismp.org/profdevelopment/.
An application can also be requested by calling 215-947-7797.

The application deadline for all Fellowship Programs is March 31, 2020.