

Disclosure

I have no relevant financial relationship with any commercial interests.

2016-2017 ISMP Targeted Medication Safety Best Practices for Hospitals

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Learning Objectives

- Describe 3 examples of medication errors that prompted the creation of the 2016-2017 ISMP Targeted Medication Safety Best Practices for Hospitals.
- Identify at least 1 way to become compliant with 3 of the Best Practices.
- Recognize a barrier to implementing at least 3 of the Best Practices.

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- Dispense vinCRISTine (and other vinca alkaloids) in a minibag of a compatible solution and not in a syringe.
- Why?
 - deadly if inadvertently given intrathecally
 - dilute the drug in a minibag that contains a volume that is too large for intrathecal administration

Purpose of the ISMP “Best Practices”

- Errors have caused harm and death, despite repeated warnings in ISMP newsletters
- 1st published for 2014-2015

Case Reports

- As of September 2013, 120 cases reported worldwide (44 occurring in the US and Canada)
- 33-year-old man with ALL in complete remission
 - Accidentally received an intended maintenance dose of IV vinCRISTine via an LP.
 - Developed acute ascending paralysis. Died 20 days later.

• **Accidental Intrathecal Administration of Vincristine:** D'Addario, Adriana. *The American Journal of Forensic Medicine and Pathology* Volume: 31 Issue 1 (2010)

Barriers to implementation

- Drug loss in tubing
- Increased risk for extravasation
- Too much volume for pediatric patients
- Others?

2. Oral Methotrexate Safety

- Why?
 - prevent errors involving inadvertent daily dosing of oral methotrexate while in the hospital and after discharge

Case Reports

- MTX ordered “every Monday”. Pt misread instructions and took med *every morning*. Pt died.
- MD ordered MTX daily instead of weekly. After 1 week, pt admitted to the hospital and died.
- MD ordered 15mg MTX weekly, but pharmacy label read 15mg daily. Error discovered when pt returned for an early refill. Long hospital stay required.
- Pt increased dose from 10 to 20mg weekly for worsening RA symptoms. Pt developed pancytopenia and died.

Reported medication errors associated with methotrexate. AJHP, 2004; 61(13): 1380-1384.
 Beware of erroneous daily oral methotrexate dosing. ISMP; 2002 Apr 3.
 Oral Methotrexate: Preventing Inadvertent Daily Administration C/JHP – Vol. 61, No. 4 – July–Aug 2008

2.a.

- Use a weekly dosage regimen default for oral methotrexate in electronic systems when medication orders are entered.

Route:

Frequency:

2.b.

- Require a hard stop verification of an appropriate oncologic indication for all daily oral methotrexate orders.

Indications:

Chemotherapy for Cancer Psoriasis

Other Non-Oncology Rheumatoid Arthritis

2.c.

- Provide specific patient and/or family education for all oral methotrexate discharge orders.



<http://www.ismp.org/tools/highalertMedications/methotrexate.pdf>

Barriers to implementation

- How will pharmacists know there is a patient on oral MTX that needs education?
- Others?

3.a.

- Weigh each patient as soon as possible on admission and during each appropriate outpatient or emergency department encounter. Avoid the use of a stated, estimated, or historical weight.
- Why?
 - Dosing based on incorrect stated, estimated or historical weights



3.b.

- Measure and document patient weights in metric units only.

Case Reports

- 17 mo prescribed clindamycin in the ED, using a wt of 25kg. Pt actually 25 lbs. Pt experienced diarrhea after 4 doses.
- Heparin protocol started based on pt weight of 80lbs. Pt actually 162 lbs. (Pt not weighed prior to starting heparin.)
- Acetylcysteine IV started for APAP OD based on stated weight. Later discovered stated weight was off by 23 kg.
- Lovenox dose based on stated weight of 160 lbs. (Pt did not want husband to know she weighed 180 lbs.)
- Weight not converted to kg. Lovenox 1mg/kg desired, but pt given 180mg based on weight of 180lbs.

Barriers to Implementation

- Unable to lock out scales to kilograms
- Beds do not have scales built in
- Cost of new scales
- Parents want to know newborn's weight in lbs/oz

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- Ensure that all oral liquids that are not commercially available as unit dose products are dispensed by the pharmacy in an oral syringe.

Case Reports

- Oral nimodipine ordered for pt unable to swallow. RN drew up contents from gelatin capsule using an IV syringe/needle, got distracted, then gave the med IV. Error discovered immediately, but patient died.
- Bulk bottle of oral midazolam stocked on nursing unit. RN drew up 6mL instead of 6mg.

Barriers to Implementation

- Workload
- Delay in waiting for Rx to prepare doses
- Others?

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- Purchase oral liquid dosing devices (oral syringes/cups/droppers) that only display the metric scale.



ISMP Medication Safety Alert: 11/1/12

Case Reports

- Midazolam 2mg (1mL) ordered as pre-procedure med for peds pt. RN administered 1 teaspoonful.
- APAP 5 mL ordered. RN gave 5 drams (= 18.45 mL)



ISMP Medication Safety Alert: 6/14/12

Barriers to Implementation

?

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- Eliminate glacial acetic acid from all areas of the hospital*.

**Laboratory use excluded if the lab purchases the product directly from an external source.*



Case Reports

- Surgeon used glacial acetic acid to identify rectal condyloma. Severe tissue damage resulted in prolonged hospitalization and extensive treatment.
- Glacial acetic acid used as irrigation fluid for greater trochanter wounds for 2 days. Resultant burns kept wounds from healing, necessitating disarticulation at the hips

NAN Alert 1/23/13

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- Segregate, sequester, and differentiate all neuromuscular blocking agents (NMBs) from other medications, wherever they are stored in the organization.
 - Eliminate from areas where they are not needed
 - Place in sealed box or RSI kit
 - If stored in ADC, use lock-lidded pockets
 - Segregate in pharmacy dept
 - Label storage bins and final container with “Warning: Paralyzing agent-causes respiratory arrest”

Barriers to Implementation

- Space constraints
- Others?

Barriers to Implementation

- Required for intra-op procedure that has no substitute (e.g., Modified Carnoy's Solution following resection of keratocystic odontogenic tumors)
- Others?

Case Reports

- 2014: Pharmacy dispensed rocuronium instead of fosphenytoin. Pt suffered anoxic brain injury and was taken off life support 2 days later.
- 15 children died after being given atracurium instead of measles vaccine
- Pharmacy dispensed 1.5 grams of vecuronium instead of vancomycin.
- Pharmacy dispensed several bags of mivacurium instead of metronidazole. One pt died, 1 seriously injured, and 2 recovered.
- ED MD entered orders on the wrong pt. RN gave vecuronium to the wrong pt, who then died.
- RN gave Norcuron instead of Narcan.

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- Administer high-alert intravenous (IV) medication infusions via a programmable infusion pump utilizing dose error-reduction software.
 - In all settings, including outpt and procedure areas
 - Build and use drug library
 - Evaluate alerts regularly

Case Reports

- RN intended to change fentanyl rate to 100 mcg/hr, but instead programmed pump for 100 mL/hr
- Heparin infused at 26 units/hr instead of 26 mL/hr (1300 units/hr)
- TPN programmed as 457 mL/hr instead of 45.7 mL/hr.

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- Ensure all appropriate antidotes, reversal agents, and rescue agents are readily available. Have standardized protocols and/or coupled order sets in place that permit the emergency administration of all appropriate antidotes, reversal agents, and rescue agents used in the facility. Have directions for use/administration readily available in all clinical areas where the antidotes, reversal agents, and rescue agents are used.

Barriers to Implementation

- Cost
- Pumps are too large for patients on multiple drips
- Drug library compliance
 - Ease of use
 - Staff accountability

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- Eliminate all 1,000 mL bags of sterile water (labeled for “injection,” “irrigation,” or “inhalation”) from all areas outside of the pharmacy.
- Why?
 - IV administration can cause hemolysis and death



Case Reports

- EMS team hung a liter bag of sterile water for inhalation instead of an IV fluid.
- Wholesaler mistakenly delivered 1L sterile water bags instead of D5W. ADC was stocked with the bags, and were hung on 2 patients.
- RT left a bag of sterile water in pt room. RN responded to IV pump alarm, and spiked the sterile water bag.

Barriers to Implementation

- 2L bags are too heavy
- Others?

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- When compounding sterile preparations, perform an independent verification to ensure that the proper ingredients (medications and diluents) are added, including confirmation of the proper amount (volume) of each ingredient prior to its addition to the final container.
 - Do not use proxy verification method (syringe “pull back”; checking label instead of ingredients)
 - Use technology to assist in verification

Barriers to Implementation

- Increased workload/production pressures
- Cost (verification technology)

Case Reports

- rocuronium/fosphenytoin error
- Magnesium 135mg IV ordered for a neonate. After the infusion, the baby stopped moving. Tech used “syringe pull back” method to show amounts used for compounding. Syringes got mixed up prior to RPh check. Tech actually used 0.27 of NS and 5.13mL of mag sulfate. (It should’ve been 0.27mL of mag sulfate and 5.13 of NS.)

Learning Assessment

- Which type of medication error discussed today causes severe neurological damage and usually death?
- T/F: Risk reduction strategies for NMBs are only necessary when they are stored on the nursing unit.
- T/F: Extravasation injuries from vincristine are more common when administered from a minibag as compared to a syringe.