The purpose of the Targeted Medication Safety Best Practices for Hospitals is to identify, inspire, and mobilize widespread, national adoption of consensus-based best practices on specific medication safety issues that continue to cause fatal and harmful errors in patients, despite repeated warnings in ISMP publications. These best practices are realistic practices, already adopted by many organizations, upon which hospitals can focus their medication safety efforts over the next two years. While targeted for the hospital based setting, some may be applicable to other healthcare settings. These best practices have been reviewed by an external expert advisory panel and approved by the ISMP Board of Trustees. Related issues of the ISMP Medication Safety Alert! are referenced after each best practice.

Bold dates are hyperlinked to key articles located on the ISMP website.
BEST PRACTICE 1:
Dispense vinCRISTine (and other vinca alkaloids) in a minibag of a compatible solution and not in a syringe.

Rationale:
The goal of this best practice is to ensure that vinca alkaloids are administered by the intravenous route only. Vinca alkaloids (vinBLASetine, vinorelbine, vinCRISTine, and vinCRISTine liposomal) can cause fatal neurological effects if given via the intrathecal route instead of intravenously. VinCRISTine is particularly problematic, and the most frequently reported, because it is often ordered in conjunction with medications that are administered intrathecally (e.g., methotrexate, cytarabine, and/or hydrocortisone). When vinca alkaloids are injected intrathecally, destruction of the central nervous system occurs, radiating out from the injection site. The few survivors of this medication error have experienced devastating neurological damage. Despite repeated warnings by various national and international safety agencies, deaths from this type of error still occur. The product labeling also carries a special warning (“For Intravenous Use Only—Fatal If Given by Other Routes”). An effective prevention strategy that reduces the risk of inadvertently administering vinca alkaloids via the intrathecal route is to dilute the drug in a minibag that contains a volume that is too large for intrathecal administration (e.g., 25 mL for pediatric patients and 50 mL for adults). Many organizations have successfully switched to preparing vinca alkaloids in minibags, including pediatric hospitals, overcoming concerns of extravasation, and other complications. There have been no reported cases of accidental administration of a vinca alkaid by the intrathecal route when dispensed in a minibag.

Related ISMP Medication Safety Alerts!:
September 5, 2013; February 23, 2006; December 1, 2005; April 5, 2000; September 23, 1998; May 20, 2010; August 14, 2008; July 26, 2007; May 18, 2006; May 1, 2003; February 6, 2003; April 5, 2000; November 4, 1998; June 18, 1997.


BEST PRACTICE 2:
a) Use a weekly dosage regimen default for oral methotrexate. If overrode to daily, require a hard stop verification of an appropriate oncologic indication.
For manual systems, require verification of an appropriate oncologic indication before dispensing oral methotrexate for daily administration.

b) Provide patient education by a pharmacist for all weekly oral methotrexate discharge orders.
Ensure that written drug information leaflets are given to patients that contain clear instructions about the weekly dosing schedule. Explain to the patient that taking extra doses is dangerous. Have the patient repeat back the instructions to ensure that the patient understands the weekly dosing schedule and that the medication is not to be used “as needed” for symptom control. Provide the patient with a copy of the free ISMP high-alert medication consumer leaflet on oral methotrexate (found at www.ismp.org/AHRQ/default.asp).

Rationale:
The goal of this best practice is to prevent errors involving inadvertent daily dosing of oral methotrexate both in the inpatient setting and after discharge. Since early 1996 and as recently as 2013, fatal errors have been reported to ISMP about the accidental daily dosing of oral methotrexate that was intended for weekly administration. Methotrexate is a folate antimetabolite used to treat different types of cancers. Since the drug’s introduction, its labeled indications have expanded to include non-oncology uses. It is now used to treat a variety of autoimmune diseases (e.g., psoriasis, severe rheumatoid arthritis, lupus) and other disorders. When used for immunomodulation to treat disorders such as rheumatoid arthritis, the drug is administered weekly or twice a week. Prescribing errors occur when physicians, who are familiar with prescribing many medications for daily administration, erroneously prescribe this medication daily instead of weekly. Dispensing errors occur in much the same way, when pharmacy technicians and pharmacists inadvertently select/approve daily instead of weekly administration during order entry or verification.

Related ISMP Medication Safety Alerts!:
BEST PRACTICE 3:

Measure and express patient weights in metric units only. Ensure that scales used for weighing patients are set and measure only in metric units.

Replace current scales that measure in pounds with new scales that only measure weight in grams or kilograms. If scales can measure in pounds and kilograms/grams, modify the scale to lock out the ability to weigh in pounds. Ensure that computer information systems and medication device screens (e.g., infusion pumps), printouts, and preprinted order forms list or prompt for weight only in grams (for neonates) or kilograms. Discontinue the documentation of a patient’s weight in pounds in all locations, instead document patients’ weight only using metric designations. Use measured weight rather than a stated, historical, or estimated weight.

Rationale:
The goal of this best practice is to standardize the measurement and communication of patient weight using only metric units of measure (grams [g] and kilograms [kg]). Official product labeling for medications provides weight-based dosing using only the metric system (e.g., mg/kg). Significant medication errors have occurred when the patients’ weight is documented in non-metric units of measure (e.g., pounds) and it has been confused with kilograms (or grams). Numerous mistakes have been reported when practitioners convert weights from one measurement system to another, or weigh a patient in pounds but accidentally document the value as kilograms in the medical record, resulting in more than a two-fold dosing error.

Related ISMP Medication Safety Alerts!:


BEST PRACTICE 4:

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

Use only oral syringes marked “Oral Use Only.” Ensure that oral syringes used do not connect to any type of parenteral tubing used in the hospital. Use of an auxiliary label “For oral use only” is also preferred, since the print on the oral syringe is small, if it does not obstruct critical information.

Rationale:
The goal of this best practice is to prevent the unintended administration of oral medications via the intravenous route. ISMP continues to receive reports in which patients were inadvertently given an oral liquid medication intravenously. This happens most often when an oral liquid is prepared extemporaneously or dispensed in a parenteral syringe that connects to vascular access lines. Such errors have resulted in patient death. Fatalities have also occurred when the contents of liquid-filled capsules (e.g., nIMODipine) were withdrawn for oral administration via a nasogastric or other tube with a parenteral syringe and then inadvertently administered intravenously. The oral syringe tip is designed to be incompatible with vascular lines so it cannot be inadvertently attached.

Related ISMP Medication Safety Alerts!:
BEST PRACTICE 5:
Purchase oral liquid dosing devices (oral syringes/cups/droppers) that only display the metric scale.

Oral liquid dosing devices that only display the metric scale should be used. In addition, if patients are taking an oral liquid medication after discharge, supply them with (or provide a prescription for) oral syringes, to enable them to measure oral liquid volumes in mL.

Rationale:
The goal of this best practice is to use liquid medication dosing devices (specifically oral syringes, cups, and droppers) that only display volume using the metric scale. ISMP has received more than 50 reports of mix-ups between milliliter (mL) and household measures such as drops and teaspoonfuls, some leading to injuries requiring hospitalization. Oral syringes, dosing cups, droppers, and other measuring devices have been involved. Use of the apothecary system has also caused confusion with mix-ups between drams and mL and other non-metric measurements such as ounces and tablespoons. ISMP first reported confusion in 2000, and has continued to receive reports of medication errors because of mix-ups between metric and non-metric units of measure.

Related ISMP Medication Safety Alerts!:
June 28, 2000; September 20, 2012; November 1, 2012; June 14, 2012; December 1, 2011; September 22, 2011; March 22, 2007; March 6, 2003; February 26, 1997.


BEST PRACTICE 6:
Eliminate glacial acetic acid from all areas of the hospital.

Remove and safely discard this product from all areas of the hospital (including the pharmacy, clinics, and physician office practices), and replace it with vinegar (5% solution) or commercially available, diluted acetic acid 0.25% (for irrigation) or 2% (for otic use). Do not allow anyone to purchase or bring glacial acetic acid into the hospital.

Rationale:
The goal of this best practice is to prevent harm from the use of glacial acetic acid applied directly to patients. The use of hazardous chemicals in pharmacy compounding or for special therapeutic procedures and diagnostics is common in many hospitals. Patient harm has occurred when toxic chemicals have been misidentified as oral products, or when a very concentrated form of a chemical has been erroneously used in treating patients. Of particular concern is glacial acetic acid. Accidental topical application of “glacial” (greater than or equal to 99.5%) acetic acid has repeatedly resulted in serious patient harm, including severe pain and serious tissue damage, third-degree burns, and in one case, bilateral leg amputation. Often in these cases, this item was either accidentally purchased or used in place of a much more diluted form of acetic acid, such as vinegar or a commercially available 0.25% acetic acid solution. There is no need for a hospital to stock glacial acetic acid.

Related ISMP Medication Safety Alerts!:

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