ISMP Targeted Medication Safety Best Practices for Hospitals

• Purpose: 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
  – Realistic practices, already adopted by many hospitals
  – Reviewed by an external expert advisory panel

Find at:  
https://www.ismp.org/guidelines/best-practices-hospitals
Recurrent Issues of Serious Harm

Examples:

- Intravenous vinca alkaloids (vin{\textit{CRIS}t}ine) accidentally administered intrathecally
- Oral methotrexate for non-oncological indications given daily instead of weekly
- Confusion over measurement of patient’s weight in kg/g and pounds resulting in dosing errors
- Unintended administration of oral products by the IV route
- Errors with measurement of liquid oral medications due to confusion between metric and non-metric labeling
- Harm from direct application of glacial acetic acid on patients
Best Practice 1

• Dispense vinCRIStine (and other vinca alkaloids) in a minibag of a compatible solution and not in a syringe.

ISMP strongly recommends against dispensing and administering intravenous VinCRIStine in a syringe.

Best Practice 1 (vinca alkaloids in minibag)

• Vinca alkaloids (vinBLAStine, 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 with accidental intrathecal administration.
• 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.
Best Practice 1
(vinca alkaloids in minibag)

• In over 135 reports, there have been no cases of accidental administration of a vinca alkaloid by the intrathecal route when dispensed in a minibag.

• This best practice is supported by The Joint Commission, the American Society of Clinical Oncology (ASCO), the Oncology Nursing Society (ONS), the National Comprehensive Cancer Network, and the World Health Organization.
Targeted Medication Safety Best Practices
Michael R. Cohen, RPh, MS, ScD (hon), DPS (hon), FASHP
President, Institute for Safe Medication Practices

Best Practice 1
Dispense Vincristine And Other Vinca Alkaloids In A Minibag Only

2019 Survey Results

VinCRIS
tine in a minibag for adult patients
- None 4.5%
- Partial 4.9%
- Full 60.7%
- Not applicable 30%

VinCRIS
tine in a minibag for pediatric patients
- None 4.9%
- Partial 3.4%
- Full 34.5%
- Not applicable 57.3%

Other vinca alkaloids in a minibag and not a syringe
- None 6.4%
- Partial 5.6%
- Full 59.4%
- Not applicable 28.6%
Best Practice 2a

• Use a weekly dosage regimen default for oral methotrexate. If overridden to daily, require a hard stop verification of an appropriate oncologic indication.

Best Practice 2a: Oral methotrexate

• Since 1996, fatalities have been reported involving accidental daily dosing of oral methotrexate intended for weekly administration in immune-related disorders such as rheumatoid arthritis, psoriasis.

• Prescribers or pharmacists used to daily administration for many other medications, erroneously type daily instead of weekly.
Best practice 2a: Oral methotrexate

- Use a weekly dosage regimen default for oral methotrexate in electronic systems (BP 2)
- Require a hard stop verification of an appropriate oncologic indication for all daily oral methotrexate orders (BP 2)
- Provide specific patient and/or family education for all oral methotrexate discharge prescriptions (BP 2)

Best Practice 2b

- Provide patient education by a pharmacist for all weekly oral methotrexate discharge orders.
  - Goal: Prevent errors involving daily dosing of oral methotrexate for non-oncology indications by patients after discharge.
Area of Focus: Methotrexate

Use a weekly dosage default for oral methotrexate in electronic systems
Area of Focus: Methotrexate

Provide patient/family education for all oral methotrexate discharge orders

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.
Best Practice 3: Metric weights

• Weigh patients as soon as possible upon admission or outpatient encounter. Avoid use of stated, estimated, or historical weight.
• Measure and document patient weights in metric units only.

• As much as possible, the patient’s actual weight is obtained upon each admission or appropriate encounter.
• Stated, estimated, or historical weights can cause inaccurate dosing (both under- and overdosing).
• Conversion errors are common.
• Official product labeling for medications provides weight-based dosing using only the metric system (e.g., mg/kg).
Best Practice 3: Metric weights

- If purchasing or replacing scales, buy new scales that measure in, or can be locked to measure in, metric units only.
- Have conversion charts that convert from kilograms (or grams for pediatrics) to pounds available near all scales, so that patients/guardians can be told the weight in pounds, if requested.
- Ensure computer screens, device screens (e.g., infusion pumps), printouts, and preprinted order forms list or prompt for the patient's weight in metric units.
- Document the patient's weight in metric units only in all electronic and written formats.
Area of Focus: Weight

Document and measure weight in metric only

Best Practice 4: Oral/ENFit syringe

• Ensure that all oral liquid medications that are not commercially available in unit dose packaging are dispensed by the pharmacy in an oral or ENFit syringe.

OK
Not OK
May be OK

Oral/ENFit Syringe
Best Practice 4: Oral/ENFit syringes

• Do not stock bulk oral solutions of medications on patient care units.
• Use only oral syringes that are distinctly marked “Oral Use Only.”
• Ensure that the oral syringes used do not connect to any type of parenteral tubing used within the organization.
• When ENFit syringes used for oral liquids, highlight on the label, or affix an auxiliary label, “For Oral Use Only” on the syringe or highlight the statement if it is on the label.

2020-2021 Changes

• Best Practice #4
• Current: Ensure that all oral liquid medications that are not commercially available in unit dose packaging are dispensed by the pharmacy in an oral or ENFit syringe.
• Change: Ensure that all oral liquid medications that are not commercially available in unit dose packaging are dispensed by the pharmacy in an oral syringe or an enteral syringe that meets the International Organization for Standardization (ISO) 80369 such as ENFit.
Oral/ENFit syringes

Provide non unit dose liquids in oral/ENFit syringes

Best Practice 5

• Purchase oral liquid dosing devices (oral syringes/ cups/droppers) that only display the metric scale.
• 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 milliliters (mL).
Best Practice #5
2020-2021 Changes

- Change: Purchase oral liquid dosing devices (oral syringes/cups/droppers) that only display the metric scale. In addition, if patients are taking an oral liquid medication after discharge, educate patients to request appropriate oral dosing devices to measure oral liquid volumes in milliliters (mL) only.
Oral Liquid Dosing Devices

Oral liquid dosing devices only display metric

Best Practices 6

• Remove glacial acetic acid to prevent accidental topical application
Targeted Medication Safety Best Practices
Michael R. Cohen, RPh, MS, ScD (hon), DPS (hon), FASHP
President, Institute for Safe Medication Practices

Best Practice 6: Remove glacial acetic acid

- Patient harm has occurred when hazardous/toxic chemicals have been misidentified as oral products, or when a very concentrated form of a chemical has been erroneously used in treating patients.
- “Glacial” acetic acid has repeatedly been confused with 3-5% used for colposcopy and other procedures, resulting in serious tissue damage, third-degree burns.
- Often 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.

Best Practice 6

Eliminate Glacial Acetic Acid From All Areas Of The Hospital

- Feb 2014: 28% None, 3% Partial, 74% Full
- Feb 2016: 8% None, 12% Partial, 75% Full
- Oct 2016: 5% None, 1% Partial, 94% Full
- July 2017: 4% None, 2% Partial, 94% Full

Legend:
- None
- Partial
- Full
2020-2021 Changes – *New classification* for Best Practice #6

- Current: Eliminate *glacial acetic acid* from all areas of the hospital.
- Change: moving to an *archived* state
- Rationale:
  - Still important as a Best Practice, but due to level of compliance we are decreasing focus
  - Will remain in the list; appear at the end
  - The Best Practice number will remain #6
  - Directs focus towards new and existing Best Practices with lower adoption rates

**Best Practice 7**

- Prevent inadvertent administration of neuromuscular blocking agents to patients not receiving proper ventilator assistance
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Michael R. Cohen, RPh, MS, ScD (hon), DPS (hon), FASHP
President, Institute for Safe Medication Practices
Best Practice 7
Neuromuscular blocking agents

- ISMP has received well over 100 reports concerning accidental administration of NMBs and has discussed the hazards of these agents since 1996.
- Most errors with the use of these agents have been the result of using or compounding a NMB in error instead of the intended drug.
- Inadequate labeling or unsafe storage has been the root cause of most of these errors.

Best Practice 7: Neuromuscular blocking agents

- Segregate, sequester, and differentiate all neuromuscular blocking agents (NMBs) from other medications, wherever they are stored in the organization.
  - Eliminate the storage of NMBs in areas of the hospital where they are not routinely needed.
  - In patient care areas where they are needed (e.g., intensive care unit), place NMBs in a sealed box or, preferably, in a rapid sequence intubation (RSI) kit.
Best Practice 7: Neuromuscular blocking agents

- Standardize storage throughout the organization and keep in lock-lidded pockets in automated dispensing cabinets.

- Segregate from all other medications in the pharmacy by placing them in separate lidded containers in the refrigerator or other secure, isolated storage area.

- Place auxiliary labels on all storage bins and/or ADC pockets and drawers as well as final medication containers of NMBs (e.g., syringes, IV bags) that state: “WARNING: PARALYZING AGENT — CAUSES RESPIRATORY ARREST — PATIENT MUST BE VENTILATED”
Neuromuscular Blocking Agents (NMB)

Segregate, sequester, differentiate NMB

Best Practice 8

• Administer high-alert IV medication infusions via a programmable infusion pump using error reduction software
Best Practice 8: Smart pump use

- Utilize this technology to prevent infusion-related medication errors, especially when high-alert medications are administered.
- Programmable infusion pumps with dose error-reduction software (DERS) help to avert these potentially harmful errors by “remembering” the large number of “rules” and applying them during pump programming to warn about potentially unsafe drug therapy.

Best Practice 8: Smart pump use

- Although this technology has been available for more than 10 years, many healthcare organizations still do not utilize smart pumps in all settings or DERS is not employed.
- Many organizations now moving to interoperability with EHR, bar coding, etc.
Best Practice 8: Smart pump use

- Review new ISMP smart pump guidelines for 2020
- Ensure drug libraries are built and installed on all smart pumps and that staff are using the error reduction software.
- If smart pumps are not already in use in all areas, ensure the capital equipment budget includes the purchase of this technology as soon as possible.
- Require periodic maintenance, updating, and testing of the software and drug library for all smart pumps.
- Evaluate alerts regularly and determine if staff are responding to them appropriately

Smart Pumps

Administer high-alert drugs using a smart pump with error reduction software

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Best Practice 9

• Identify which antidotes, reversal agents, and rescue agents should be administered immediately in emergency situations to prevent patient harm.

Area of Focus: Antidotes

Antidotes, reversal, and rescue agents are available with protocols and instructions

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Best Practice 10

- Eliminate all 1,000 mL bags of sterile water (labeled for “injection,” “irrigation,” or “inhalation”) from all areas outside of the pharmacy.

Sterile Water

Store 1 liter bags of sterile water in pharmacy only

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Best Practice 11

- Use technology to assist in the verification process (e.g., barcode scanning verification of ingredients, gravimetric verification, robotics, IV workflow software) to augment the manual processes.

- The technology is maintained, the software is updated, and that the technology is always used in a manner that maximizes its medication safety features.

Dangerous Wrong-Route Errors with Tranexamic Acid

ISMP has received multiple reports of accidental intraspinal injection of tranexamic acid.

- In the US, tranexamic acid, bupivacaine and ropivacaine have all been confused
- Though labels may look different, vials are often stored upright and only the blue cap is visible
- Barcoding is usually not implemented in the departments where these drugs are most often used!!!!!
Targeted Medication Safety Best Practices
Michael R. Cohen, RPh, MS, ScD (hon), DPS (hon), FASHP
President, Institute for Safe Medication Practices

Best Practice 12*

• Eliminate the prescribing of fentaNYL patches for acute pain and in opioid-naïve patients
  – Ensure the organization has a process in place to routinely document the patient’s opioid status (naïve vs. tolerant) and type of pain (acute vs. chronic) in the health record or prescriber orders.
  – Ensure there is an implemented process to prevent or verify orders for fentaNYL patches in patients who are opioid-naïve or with acute pain.
    • Examples include: use of hard stops, alerts, automatic interchange, and pharmacy interventions with prescribers.

* Now part of Best Practice 15

Best Practice 13

• Eliminate injectable promethazine from the hospital.
  – Remove injectable promethazine from all areas of the hospital including the pharmacy.
  – Classify injectable promethazine as a non-stocked, non-formulary drug.
  – Implement a medical staff-approved automatic therapeutic substitution policy to convert all injectable promethazine orders to another antiemetic.
  – Remove injectable promethazine from all computerized medication order screens and order sets and protocols.
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Introduced for 2018-2019: Promethazine

- Eliminate injectable promethazine from the hospital
  - None 40.3%
  - Partial 28.4%
  - Full 31.3%
- In process; use has been wide, so taking time; working through Pharmacy and Therapeutics; limit to short infusion/intramuscular; many restrictions; challenges with shortages; others non-stocked item or removed; provider push back

Best Practice 14

- Seek out and use information about medication safety risks and errors that have occurred in other organizations besides your own, and take action to prevent similar errors.
New Best Practice #15

• Verify and document a patient’s opioid status (naïve versus tolerant) and type of pain (acute versus chronic) before prescribing and dispensing extended-release and long-acting opioids.

New Best Practice #15

• Current Best Practice #12 (fentaNYL patches) has been repositioned and made part of this new Best Practice.
  • None 14.4%
  • Partial 33.3%
  • Full 52.2%
New Best Practice #16

- 16a: Limit the variety of medications that can be removed from an automated dispensing cabinet (ADC) using the override function.
- 16b: Require a medication order (e.g., electronic, written, telephone, verbal) prior to removing any medication from an ADC, including those removed using the override function.
- 16c: Monitor automated dispensing cabinet overrides to verify appropriateness, transcription of orders, and documentation of administration.
- 16d: The list of medications available using the override function is periodically reviewed for appropriateness.

New Best Practice #16

- Restrict medications available using override to those that would be needed emergently (as defined by the organization) such as antidotes, rescue and reversal agents, life-sustaining drugs, and comfort measure medications such as those used to manage acute pain or intractable nausea and vomiting.
Thank YOU!

- Our readers and reporters
- Our newsletter reviewers
- Those who take our surveys
- Everyone who shared today
- All who are passionate about medication safety!