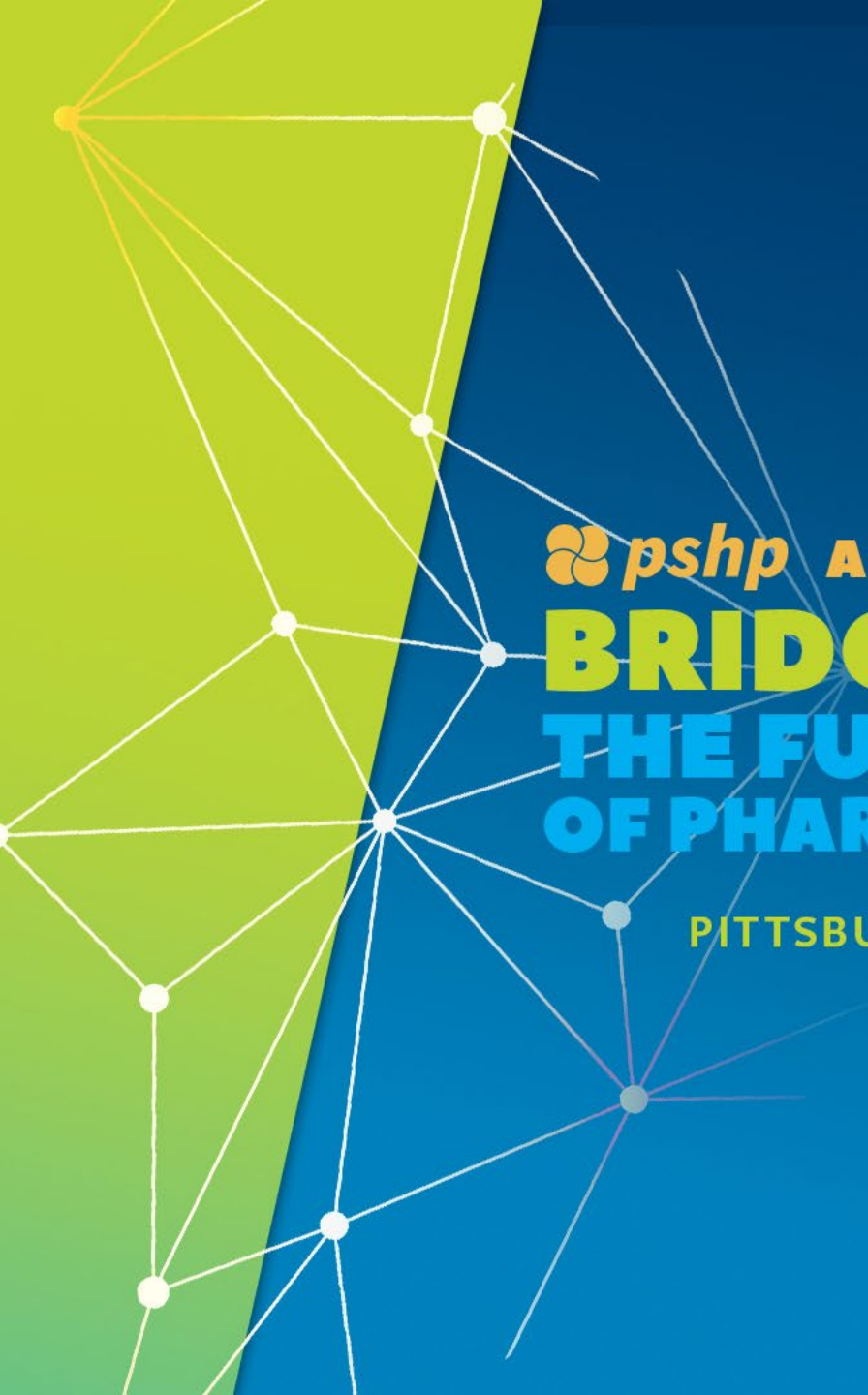




 **pshp** ANNUAL ASSEMBLY

**BRIDGING
THE FUTURE
OF PHARMACY** 2022

PITTSBURGH, PA | NOVEMBER 2-5, 2022



Making your Mark on Medication Safety

A Review of ISMP Targeted Medication Safety Best Practices



Christina Topalidis, PharmD
Hospital of the University of Pennsylvania
November 5, 2022

Objectives

- Recognize the ISMP Targeted Medication Safety Best Practices for 2022-2023
- Critically analyze current institutional practices regarding the medication use system
- Develop a plan to incorporate best practice recommendations into daily patient care activities



Institute for Safe Medication Practices (ISMP)

Institute for Safe Medication Practices (ISMP)

- **Mission:** Advancing patient safety worldwide by empowering the healthcare community to prevent medication errors
- **Vision:** To be the premier independent, patient safety organization leading the effort to prevent medication errors and adverse drug events



Targeted Medication Safety Best Practices for Hospitals

- **Purpose:** Identify, inspire, and mobilize widespread, adoption of consensus-based Best Practices for specific medication safety issues that continue to cause fatal and harmful errors in patients
 - Targeted for the hospital-based setting
 - Reviewed by an external Expert Advisory Panel
 - Approved by the ISMP Board of Directors
 - ISMP encourages implementation of Targeted Medication Safety Best Practices for Hospitals as a priority

Dispense vinCRISTine and other vinca alkaloids in a minibag, not a syringe

Safe administration and error prevention of oral methotrexate

Measure and document patient weight in metric units only

Dispense all oral liquid preparations in commercial packaging or ENFit syringes

Utilize oral liquid dosing devices that only display the metric scale

Eliminate glacial acetic acid from all areas of the hospital

Segregate, sequester, and differentiate neuromuscular blocking agents

2022-2023 ISMP Targeted Medication Safety Best Practices

Administer intravenous medications via a “smart” infusion pump

Ensure that appropriate antidotes, reversal agents, and rescue agents are readily available

Eliminate all 1,000 mL bags of sterile water from areas outside of the pharmacy

Perform an independent verification of compounded sterile preparations

Eliminate the prescribing of fentaNYL patches for opioid-naïve patients and/or patients with acute pain

Eliminate injectable promethazine from the formulary

Track medication safety risks and errors to promote continuous quality improvement

Verify and document a patient’s opioid status and type of pain before prescribing and dispensing extended-release and long-acting opioids

Promote the safe use of automated dispensing cabinets (ADC)

Safeguard against errors with oxytocin use

Maximize the use of barcode verification prior to medication and vaccine administration

Promote strategies to improve safety with high-alert medications



Meet Larry...

Patient Presentation

Patient (DOB, age)	Lack-o-luck, Larry (5/24/1995; 27 years)
Allergies	NKDA
Chief Complaint	"I'm here for my ch
Social History	Smoke
Past Medical History	
Home Medications	three times daily (log U-100) via insulin pump – 1.3 units/h; TID with meals per ratio 15:1 budesonide 160 mcg/formoterol 4.5 mcg – 2 inhalations twice daily Albuterol 90 mcg/act – 2 inhalations every 4-6 hours as needed Fluticasone propionate 50 mcg/spray – 2 sprays in each nostril once daily Loratadine 10 mg – 1 tablet once daily

Name: Lack-o-luck, Larry

MRN: 4843549226

DOB: 05/24/1995

Age: 27

Sex: M





Chemotherapy
LACK-O-LUCK, LARRY

HETON-H1269

MRN: 4843549226 CSN: 12142019
DOB: 26 years [05/24/1995]

2 mg
50 mL

Vincristine
Sodium chloride 0.9%

intraVENOUS once
Total Volume: 50 mL

Infuse Over: 0.5 hours

ORD#81818181

Prep: _____

Check: _____



*****Chemotherapy*****

LACK-O-LUCK, LARRY

HETON-H1269

MRN: 4843549226 CSN: 12142019

DOB: 26 years [05/24/1995]

Vincristine	2 mg
Sodium chloride 0.9%	50 mL

intraVENOUS once

Total Volume: 50 mL

Infuse Over: 0.5 hours

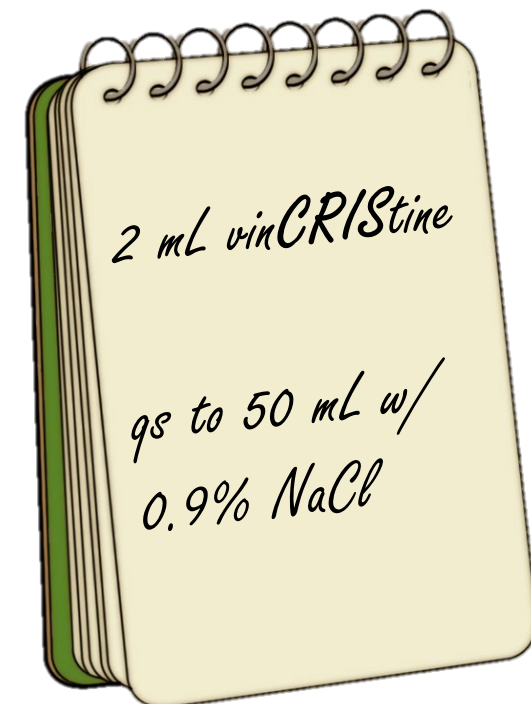


ORD#81818181

Prep: T118 Check: _____



Conc. 2 mg/2 mL



Question 1. Are you going to approve and send out the vin**CRIS**tine prepared by Technician Tommy?

Yes

No

*****Chemotherapy*****

LACK-O-LUCK, LARRY

HETON-H1269

MRN: 4843549226 CSN: 12142019

DOB: 26 years [05/24/1995]

Vincristine	2 mg
Sodium chloride 0.9%	50 mL

intraVENOUS once
Total Volume: 50 mL
Infuse Over: 0.5 hours

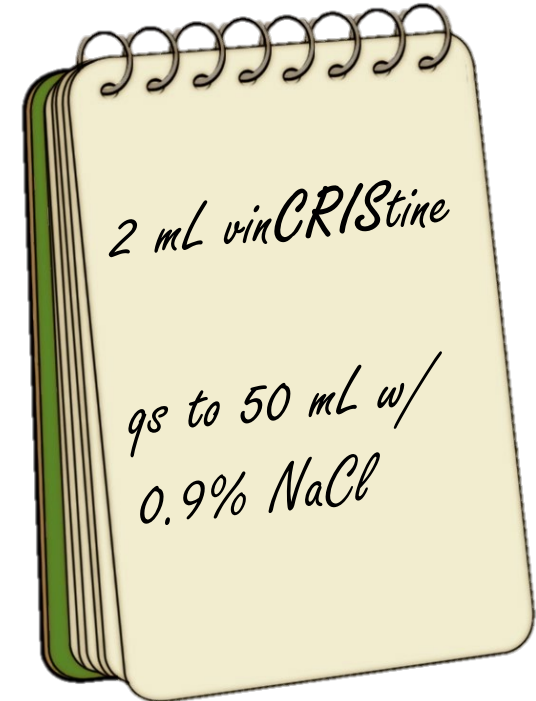


ORD#81818181

Prep: T118 Check: _____



Conc. 2 mg/2 mL



Best Practice 1 – Dispense vinCRIStine and other vinca alkaloids in a minibag, not a syringe

Best Practice 11 – Perform an independent verification of compounded sterile preparations

93.101.262-9
110415
PCH217
1024/1

Each mL contains 1 mg vincristine sulfate, USP, 100 mg mannitol, water for injection q.s., acetic acid and sodium acetate for pH control, pH range 3.5 to 5.5.

CAUTION: DOSAGE MAY BE CRITICAL. Be certain of vial strength and dosage calculation before administering.

WARNING—This is a potent drug. Do not administer without reading directions in package insert. See package insert for dosage and method of administration.

Rev. D 9/2015

Manufactured In
The Netherlands By:
Pharmachemie B.V.
Haarlem, The Netherlands
Manufactured For:
TEVA PHARMACEUTICALS USA, INC.,
North Wales, PA 19454

NDC 0703-4402-11

Rx only

Vincasar PFS®

(vinCRISTine sulfate
injection USP)

PRESERVATIVE FREE SOLUTION

1 mg/mL

Caution: Cytotoxic Agent
Single Use Vial
REFRIGERATE
Protect From Light

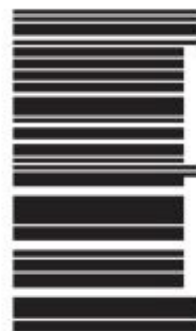
**FOR INTRAVENOUS USE ONLY
FATAL IF GIVEN BY OTHER ROUTES**

Protect from light and retain
in carton until time of use.
Store upright.

Store under refrigeration
between 2° to 8°C (36° to 46°F).

Discard unused solution.

See bottom panel for lot
number and expiration date.



3 0703-4402-11 5

Best Practice 11 – Perform an independent verification of compounded sterile preparations

First Introduced		
2016-2017	Background	Serious compounding errors have resulted in patient harm due to preparation of the wrong concentration/strength of a product, the wrong product, or the wrong diluent
	Goal	To prevent medication errors during sterile compounding
	Best Practice	Perform an independent verification of proper medication, diluent, and volumes for all sterile compounded preparations



VinCRIStine 2 mg

Quantity needed: 2 mg = 2 mL

Quantity used: 2 mg = 2 mL

0.9% NaCl

Quantity needed: 48 mL

Quantity used: 48 mL

Recipe



Next

Question 1. Are you going to approve and send out the vin**CRIS**tine prepared by Technician Tommy?

 YES

 NO



*****Chemotherapy*****

LACK-O-LUCK, LARRY

HETON-H1269

MRN: 4843549226 CSN: 12142019

DOB: 26 years [05/24/1995]

Vincristine 1 mg
Sodium chloride 0.9% 50 mL

intraVENOUS
Total Volume 50 mL
Infuse Over 1.5 hours



ORD#81818181

Prep: T118 Check: P245





Best Practice 18 – Maximize the use of barcode verification prior to medication and vaccine administration

Best Practice 18 – Maximize the use of barcode verification prior to medication and vaccine administration

First Introduced

2022-2023	Background	• BCMA is a proven error prevention strategy • Not yet widely adopted in in various practice settings
	Goal	• To expand the utilization of barcode verification beyond inpatient care units
	Best Practice	• Maximize BCMA prior to medication and vaccine administration • Expand use beyond inpatient care areas



Question 2. What is an example of an area that BCMA can be utilized/implemented to prevent medication errors? **Select all that apply**

Emergency department

Dialysis

Radiology

Cath lab

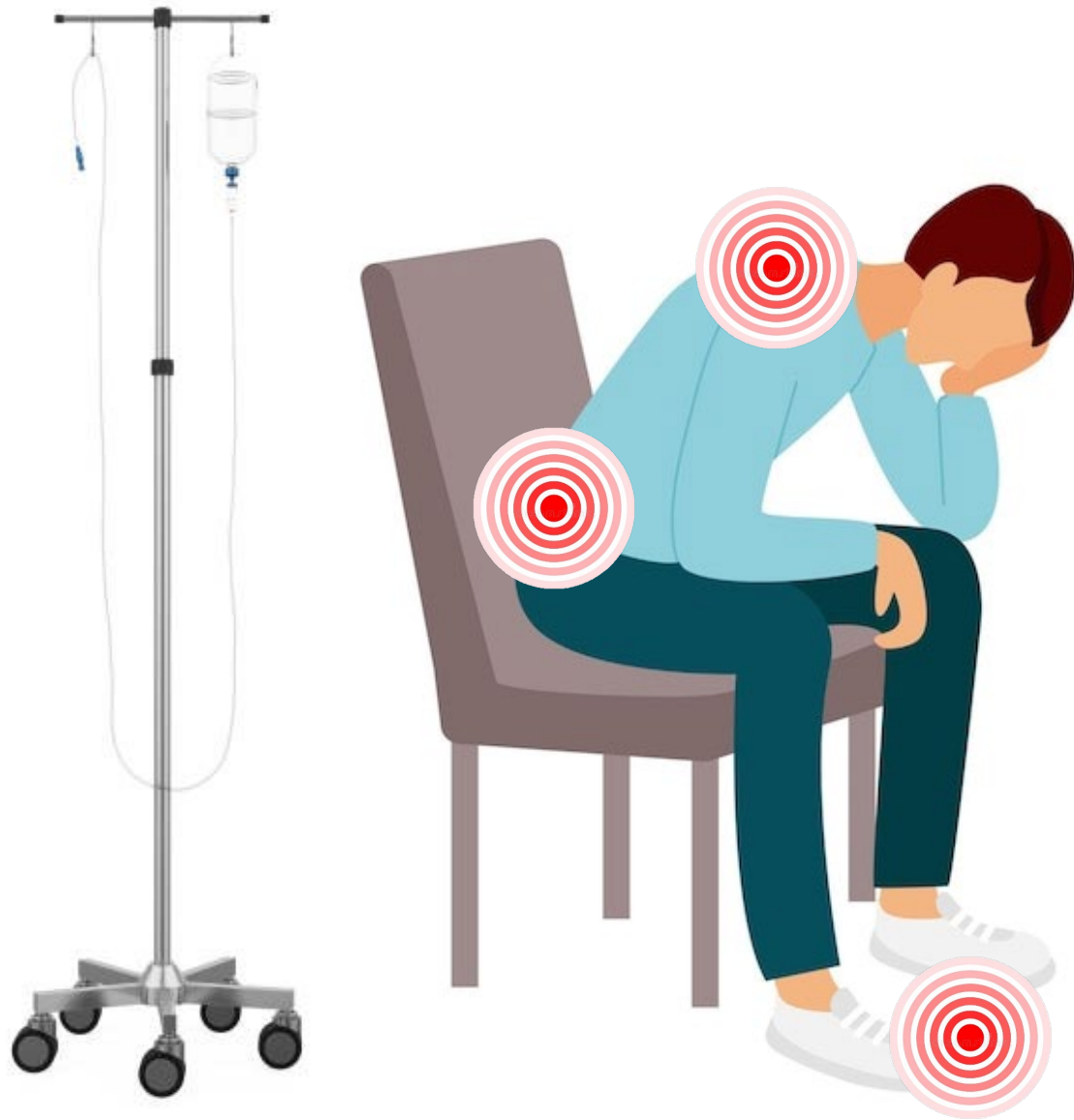
Question 2. What is an example of an area that BCMA can be utilized/implemented to prevent medication errors? **Select all that apply**

Emergency
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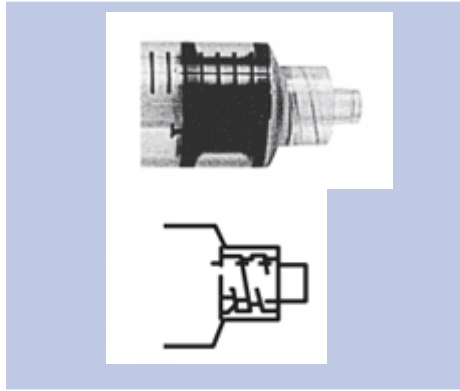
Best Practice 4 – Dispense all oral liquid preparations in commercial packaging or ENFit syringes

Best Practice 5 – Utilize oral liquid dosing devices that only display the metric scale

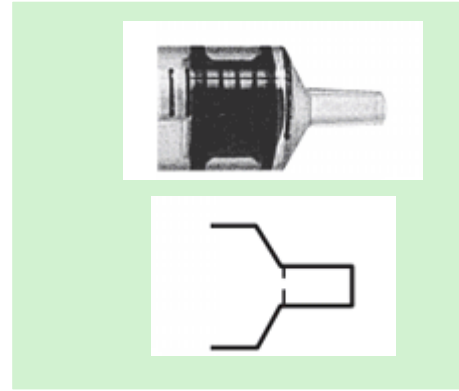
Best Practice 4 – Dispense all oral liquid preparations in commercial packaging or ENFit syringes

First Introduced		
2014-2015	Background	- Oral liquid medications have inadvertently been administered via the intravenous route - Errors most commonly occur when oral liquids are prepared extemporaneously or dispensed in parenteral syringes with connectivity to vascular access lines
	Goal	To prevent the unintended intravenous administration of oral liquid medications
	Best Practice	Dispense all oral liquid medications in an oral syringe or an enteral syringe

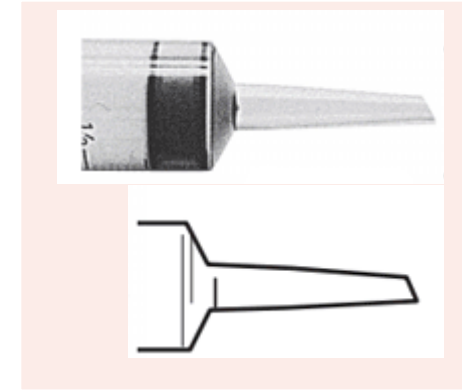




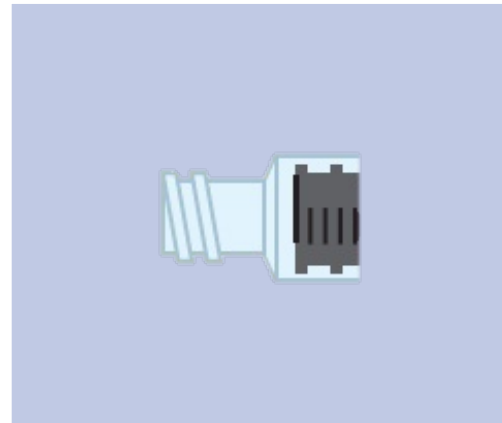
Luer lock



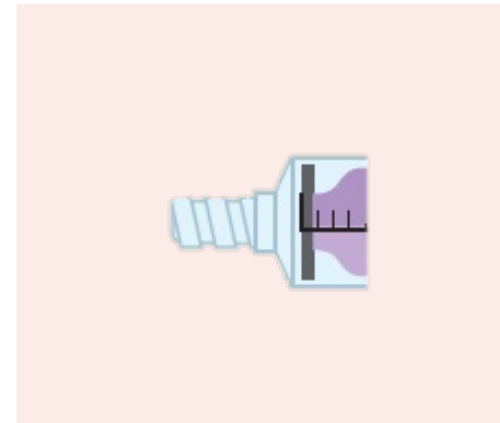
Slip tip



Catheter tip



Reverse-Luer



Non-Luer

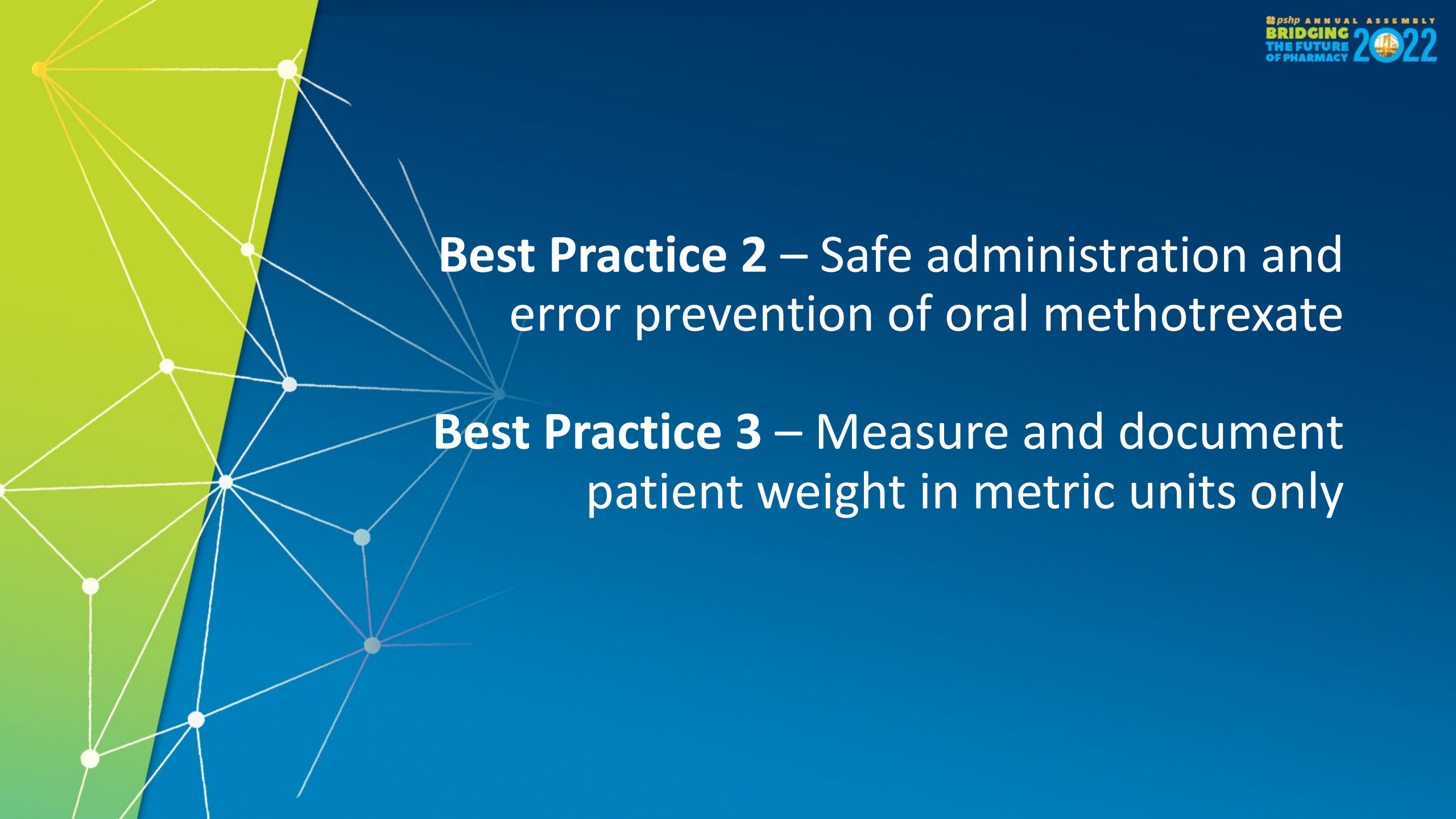
Best Practice 5 – Utilize oral liquid dosing devices that only display the metric scale

First Introduced		
2014-2015	Background	Mix-ups between milliliters (mL) and household measures are a common cause of medication errors that have led to injuries requiring hospitalization
	Goal	To use liquid medication dosing devices that only display volume using the metric scale
	Best Practice	Purchase oral liquid dosing devices (oral syringes/cups/droppers) that only display metric units









Best Practice 2 – Safe administration and error prevention of oral methotrexate

Best Practice 3 – Measure and document patient weight in metric units only

Best Practice 2 – Safe administration and error prevention of oral methotrexate

First Introduced		
2014-2015	Background	Medication errors resulting in methotrexate overdose and toxicity have occurred at multiple stages of the medication use process
	Goal	To prevent errors associated with the inadvertent use of daily oral methotrexate
	Best Practice	What are your thoughts?



Question 3. Which of the following tools or strategies could be implemented to promote the safe prescribing and dispensing of methotrexate? **Select all that apply**

Provide patient/family counseling at discharge

Remove methotrexate from the formulary

Default the frequency to “weekly” at order entry

Nothing can be done to mitigate this error

Question 3. Which of the following tools or strategies could be implemented to promote the safe prescribing and dispensing of methotrexate? **Select all that apply**

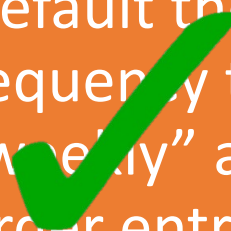
Provide patient/family counseling at discharge



Remove methotrexate from the formulary



Default the frequency to "weekly" at order entry



Nothing can be done to mitigate this error



Best Practice 2 – Safe administration and error prevention of oral methotrexate

First Introduced

2014-2015	Background	Medication errors resulting in methotrexate overdose and toxicity have occurred at multiple stages of the medication use process
	Goal	To prevent errors associated with the inadvertent use of daily oral methotrexate
	Best Practice	- Default a weekly dosage regimen for oral methotrexate at CPOE in the EHR - Require a hard stop during the verification for all daily oral methotrexate orders - Provide discharge counseling to patients and/or family members



Best Practice 3 – Measure and document patient weight in metric units only

First Introduced

2014-2015	Background	- Medication errors have resulted due to patient weight being incorrectly communicated or documented in non-metric units of measure - Official medication product labeling provides dosage recommendations in metric units only as mg, mg/kg, or units/kg
	Goal	- To ensure that the patients actual body weight is obtained upon each admission - To standardize the body weight measurement in the EHR
	Best Practice	- Weigh each patient as soon as possible upon admission and during each appropriate encounter - Measure and document patient weight in metric units only







Patient weight is 139, can you document that in the chart?

Sure, I have the profile up now. 139, correct?

Yes, thank you John!

No problem Debby, glad I could help







Question 4. Out of the best practices that we have review so far, which one(s) could have been utilized to prevent this error? **Select all that apply**

#1 Dispense
vinCRISTine in
a minibag

#4 Measure /
document
patient weight
in metric units

#11
Independent
verification of
CSP's

#18 Maximize
the use of
barcode
verification

Question 4. Of the best practices that we have reviewed so far, which one(s) could have been utilized to prevent this error? Select all that apply

#1 Misreading
vinCasting in
a mg



Measure /
document
patient weight
in metric units



#11
Independent
verification
CSP's



#18 Maximize
the use of
barcode
verification





Best Practice 7 – Segregate, sequester, and differentiate neuromuscular blocking agents (NMBs)

Best Practice 9 – Ensure that appropriate antidotes, reversal agents, and rescue agents are readily available

Best Practice

sequester, and
blocking agents

**WARNING: CAUSES RESPIRATORY
PARALYSIS – PATIENT MUST BE
VENTILATED**



**WARNING: CAUSES RESPIRATORY
ARREST – PATIENT MUST BE
VENTILATED**



**WARNING: PARALYZING AGENT –
CAUSES RESPIRATORY ARREST**



Background

2016-2017

Goal

- To prevent the
particularly those without

Best Practice

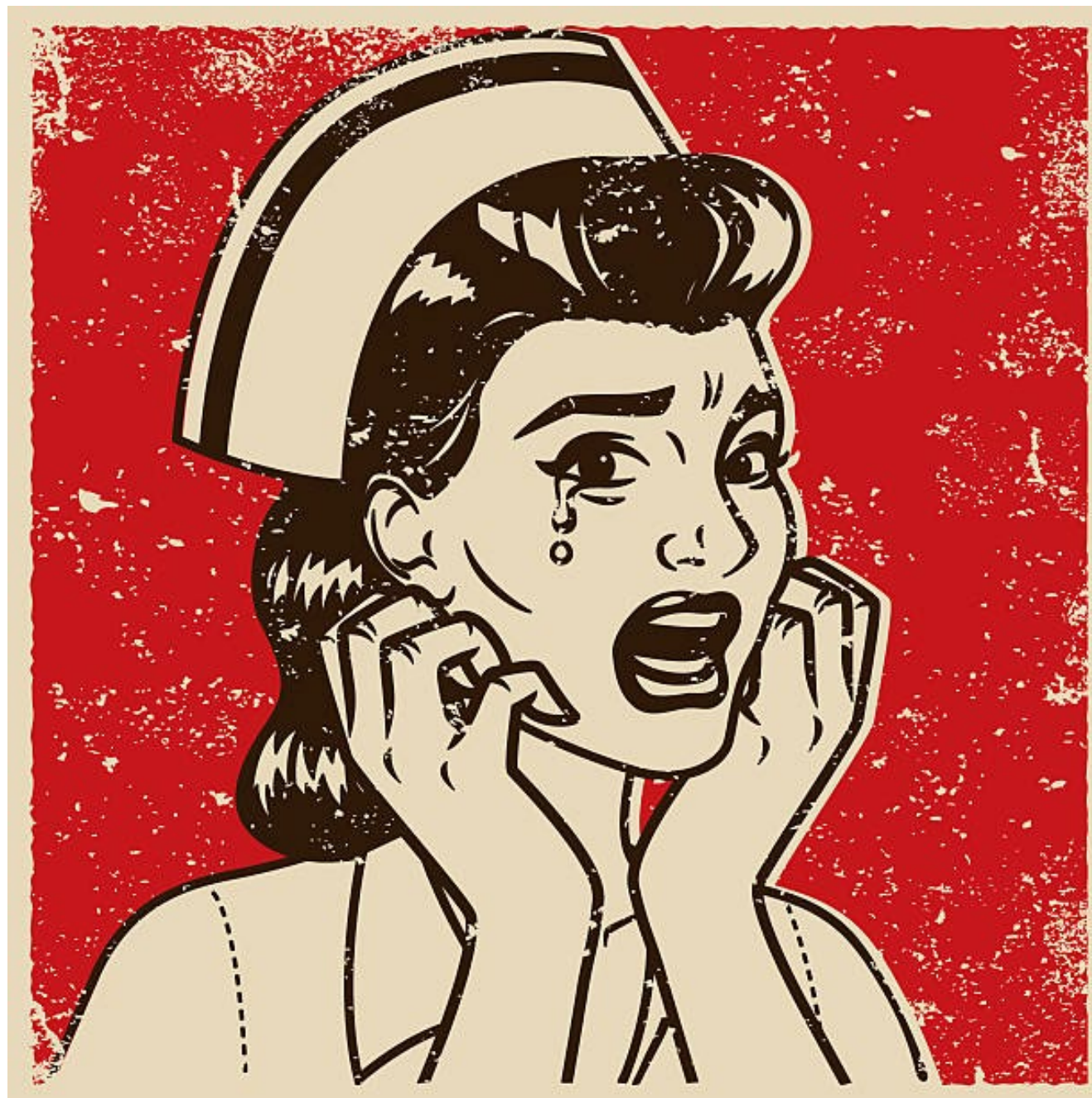
- NMBs should be
from



Best Practice 9 – Ensure that appropriate antidotes, reversal agents, and rescue agents are readily available

First Introduced		
2016-2017	Background	- Delay in the administration of appropriate antidote, reversal, or rescue agents leads to serious patient harm - Accidental overdose of medications for therapeutic use have also resulted in adverse effects
	Goal	To ensure the immediate availability of antidote, reversal, or rescue agents for drugs known to have a high potential for adverse drug reactions, or administration of toxic doses
	Best Practice	- Ensure that all appropriate antidotes, reversal, and rescue agents are readily available - Implement standardized protocols and/or order sets - Ensure that directions for administration are readily available





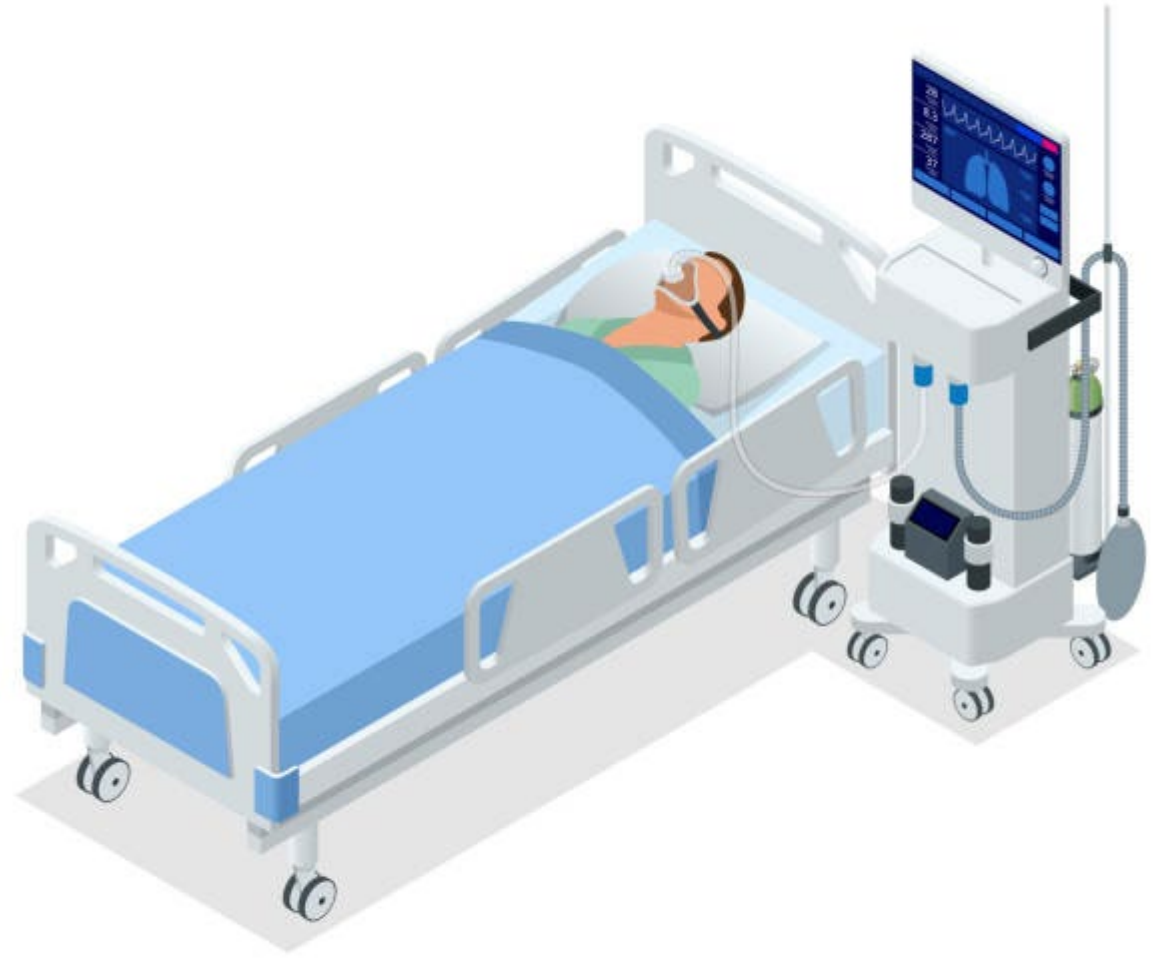


Best Practice 8 – Administer intravenous medications via a “smart” infusion pump

Best Practice 8 – Administer intravenous medications via a “smart” infusion pump

First Introduced		
2016-2017	Background	- Infusion-related medication errors can cause significant harm to patients - Programmable infusion pumps serve to mitigate potentially harmful medication errors via institution-defined dosing limits and clinical advisories
	Goal	To prevent medication errors associated with intravenous infusion in both the inpatient and outpatient setting
	Best Practice	Administer medication infusions via a “smart” pump device utilizing dose-error reduction systems (DERS)





Dispense vincristine and other vinca alkaloids in a minibag, not a syringe

Safe administration and error prevention of oral methotrexate

Measure and document patient weight in metric units only

Dispense all oral liquid preparations in commercial packaging or NFit syringes

Utilize oral liquid dosing devices that only display the metric scale

Eliminate glacial acetic acid from all areas of the hospital

Segregate, sequence, and differentiate neuromuscular blocking agents

2022-2023 ISMP Targeted Medication Safety Best Practices

Administer intravenous medications via "smart" infusion pump

Ensure that appropriate antidotes, reversal agents, and rescue agents are readily available

Eliminate all 1,000 mL bags of sterile water from areas outside of the pharmacy

Perform an independent verification of compounded sterile preparations

Eliminate the prescribing of fentanyl patches for opioid-naïve patients and/or patients with acute pain

Eliminate injectable promethazine from the formulary

Track medication safety risks and errors to promote continuous quality improvement

Verify and document a patient's opioid status and type of pain before prescribing and dispensing extended-release and long-acting opioids

Promote the safe use of automated dispensing cabinets (ADC)

Safeguard against errors with oxytocin use

Maximize the use of barcode verification prior to medication and vaccine administration

Promote strategies to improve safety with high-alert medications



Best Practice 10 – Eliminate all 1,000 mL bags of sterile water from areas outside of the pharmacy

Best Practice 16 – Promote the safe use of automated dispensing cabinets (ADC)

Best Practice 17 – Safeguard against errors with oxytocin use

Best Practice 10 – Eliminate all 1,000 mL bags of sterile water from areas outside of the pharmacy

First Introduced		
2016-2017	Background	The intravenous administration of large quantities of SWFI has resulted in patient harm, including death, due to hemolysis
	Goal	To prevent the accidental intravenous administration of SWFI
	Best Practice	Eliminate all 1,000 mL bags of SWFI from all areas outside of the pharmacy



Question 5. Have you ever pulled a medication via override from an ADC?

Yes

No

Best Practice 16 – Promote the safe use of automated dispensing cabinets (ADC)

First Introduced		
2020-2021	Background	- Overriding medications from ADCs has resulted in repeated reports of patient harm - The override function is often inappropriately perceived as routine
	Goal	To minimize the use of the override function for removal of medication from ADCs
	Best Practice	- Restrict the variety of medications available for override - Require a medical order prior to medication removal - Monitor ADC overrides to determine appropriateness - Conduct periodic reviews

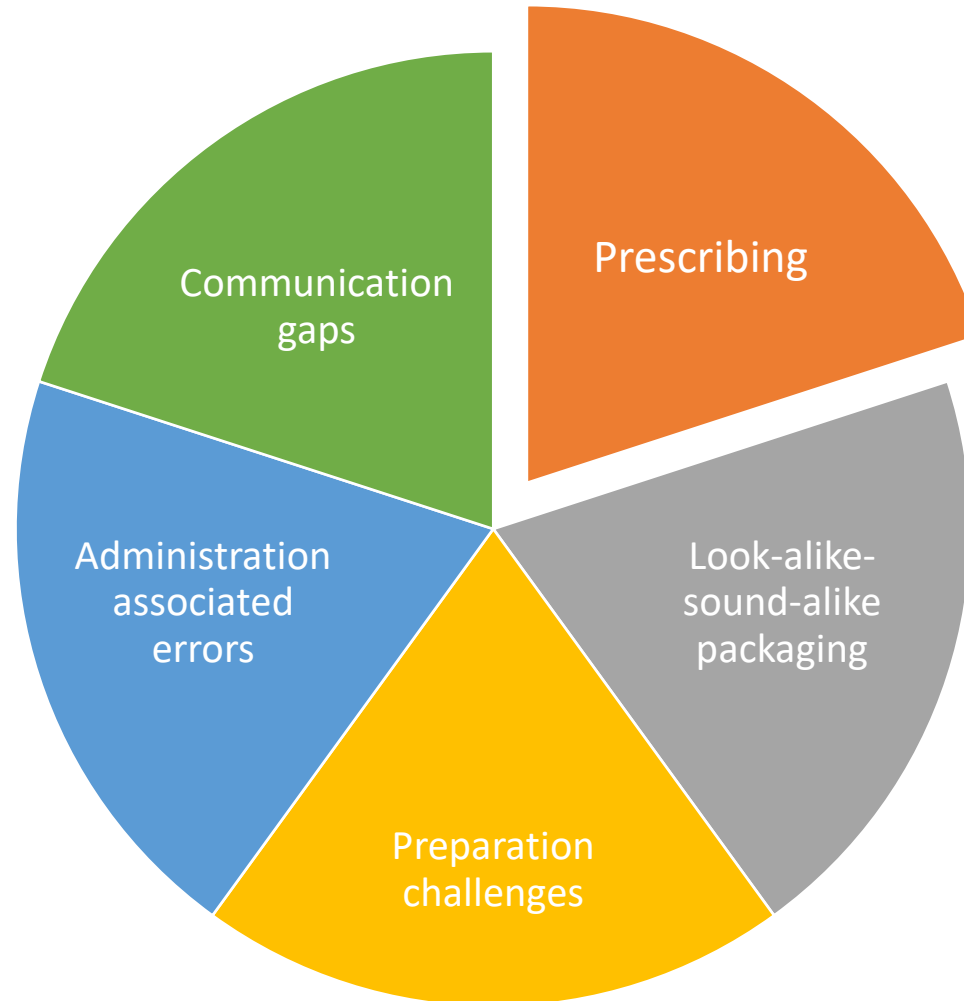


Best Practice 17 – Safeguard against errors with oxytocin use

First Introduced		
2022-2023	Background	Maternal, fetal, and neonatal deaths have been reported due to the improper administration of oxytocin
	Goal	To prevent errors associated with the use of oxytocin
	Best Practice	Safeguard the use of oxytocin via standardization of concentration, order sets, expression of dose rate, and delivery



Best Practice 17 – Safeguard against errors with oxytocin use (cont.)





Best Practice 12 – Eliminate the prescribing of fentaNYL patches for opioid-naïve patients and/or patients with acute pain
(Incorporated into Best Practice 15)

Best Practice 15 – Verify and document a patient's opioid status and type of pain before prescribing and dispensing extended-release and long-acting opioids

Best Practice 15 – Safe opioid practices

First Introduced		
2020-2021	Background	FentaNYL patches ranked among the highest drugs involved in serious ADEs from 2008 to 2010
	Goal	- Support the appropriate prescribing of extended-release and long-acting opioids - Prevent the inappropriate use of fentaNYL patches for the management of acute pain
	Best Practice	Verify a patients opioid status and type of pain prior to the prescription and dispensing of extended-release and long-acting opioids







Best Practice 13 – Eliminate injectable promethazine from the formulary

Best Practice 13 – Eliminate injectable promethazine from the formulary

First Introduced		
2018-2019	Background	The administration of injectable promethazine has resulted in serious patient harm due to inadvertent arterial injection or IV extravasation
	Goal	Eliminate the risk of serious tissue injuries resulting from the inadvertent extravasation of IV promethazine
	Best Practice	Remove injectable promethazine from the formulary





WHAT'S
THE
POINT?

Dispense vincristine and other vinca alkaloids in a minibag, not a syringe

Safe administration and error prevention of oral methotrexate

Measure and document patient weight in metric units only

Dispense all oral liquid preparations in commercial packaging or NFit syringes

Utilize oral liquid dosing devices that only display the metric scale

Eliminate acetic acid from all areas of the hospital

Segregate, sequence, and differentiate neuromuscular blocking agents

2022-2023 ISMP Targeted Medication Safety Best Practices

Administer intravenous medications via "smart" infusion pump

Ensure that appropriate antidotes, reversal agents, and rescue agents are readily available

Eliminate all 1,000 mL bags of sterile water from areas outside of the pharmacy

Perform an independent verification of compounded sterile preparations

Eliminate the prescribing of fentanyl patches for opioid-naïve patients and/or patients with acute pain

Eliminate injectable promethazine from the formulary

Track medication safety risks and errors to promote continuous quality improvement

Verify and document a patient's opioid status and type of pain before prescribing and dispensing extended-release and long-acting opioids

Promote the safe use of automated dispensing cabinets (ADC)

Safeguard against errors with oxycodone use

Maximize the use of barcode verification prior to medication and vaccine administration

Promote strategies to improve safety with high-alert medications



Best Practice 14 – Track medication safety risks and errors to promote continuous quality improvement

Best Practice 19 – Promote strategies to improve safety with high-alert medications

Best Practice 14 – Track medication safety risks and errors to promote continuous quality improvement

First Introduced		
2018-2019	Background	- Natural human tendency to normalize errors that happen elsewhere - Learning from errors occurring at outside institutions/practices
	Goal	To promote continuous quality improvement in preventing medication errors starting by assessment of current high alert medications
	Best Practice	Seek out information regarding medication safety and errors that have occurred at other institutions and take action to prevent similar errors



Best Practice 14 – Track medication safety risks and errors to promote continuous quality improvement (cont.)

Appointment

Identification

Establishment

Determination

Share stories



Best Practice 19 – Promote strategies to improve safety with high-alert medications

First Introduced		
2022-2023	Background	- High-alert medications carry a great risk for error and patient harm - Many hospitals have developed high-alert medication lists with processes for the management of these medications
	Goal	To engage hospitals to reassess current high-alert medications and enact robust error prevention strategies
	Best Practice	Layer numerous strategies throughout the medication-use process to improve safety with high-alert medications



Best Practice 19 – Promote strategies to improve safety with high-alert medications (cont.)

Risk management processes

Address system vulnerabilities

Avoid reliance on low-leverage risk reduction strategies

Limit independent double checks

Routinely collect and assess data

Question 6. What is an example of a high leverage risk reduction strategy? Select all that apply

Use commercially available products instead of preparing solutions

Standardize concentrations, container sizes, and drugs used to treat specific conditions

Use oral syringes that cannot be connected to IV tubing ports

Use engineering features that stop a process from moving forward or require the entry of key information (e.g., allergies) before proceeding

Question 6. What is an example of a high leverage risk reduction strategy? Select all that apply

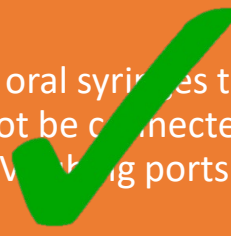
Use commercially available products instead of preparing solutions



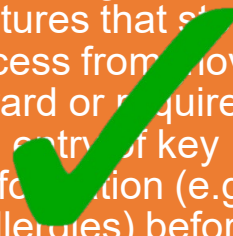
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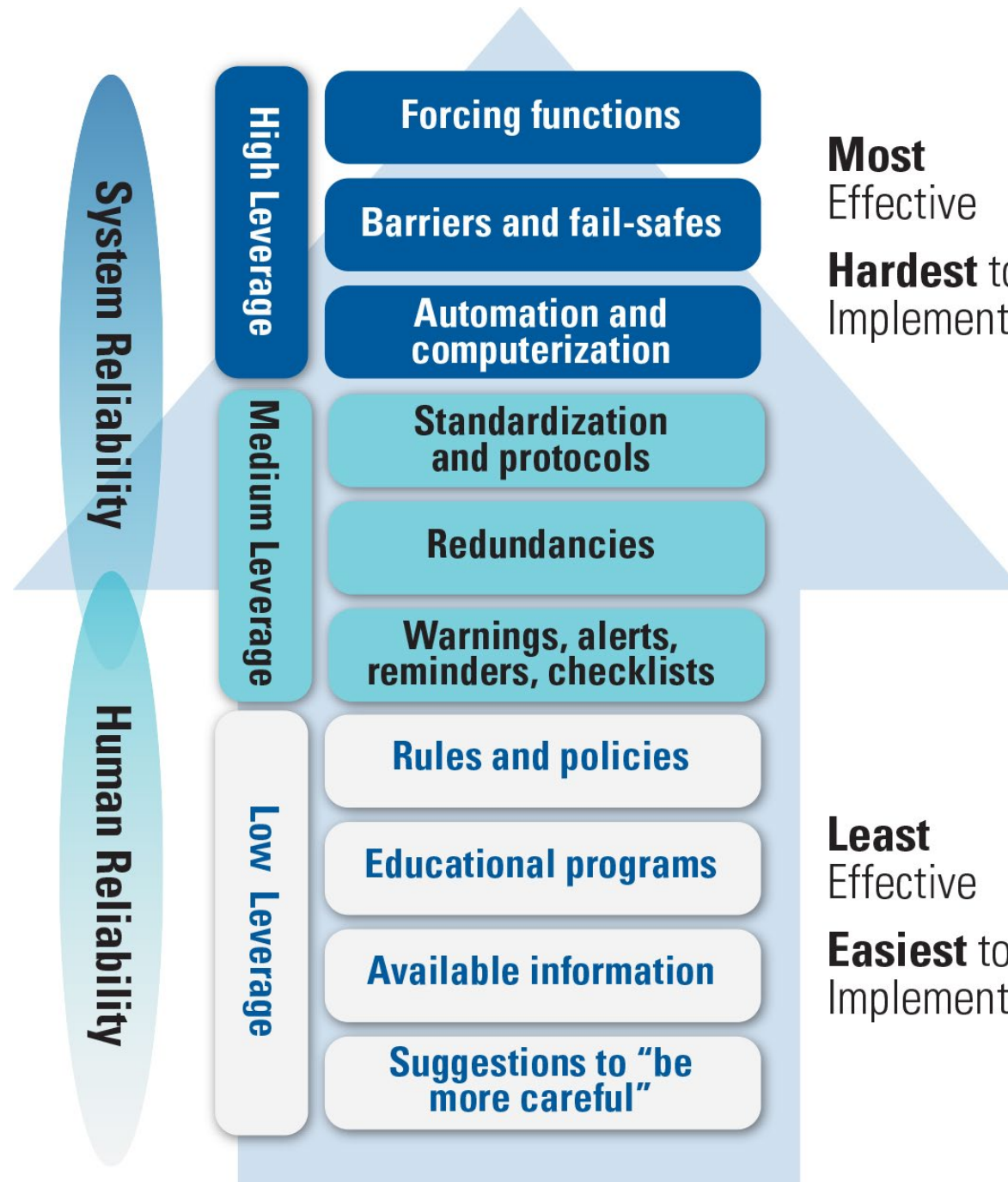


Use oral syringes that cannot be connected to IV tubing ports



Use engineering features that stop a process from moving forward or require the entry of key information (e.g., allergies) before proceeding







Summary of Accomplishments

- Reviewed the ISMP Targeted Medication Safety Best Practices for 2022-2023
- Assessed current institutional practices regarding the medication use system
- Developed a plan to incorporate best practice recommendations into daily patient care activities

How You Can Make an Impact

Promote the implementation of ISMP 2022-2023 TMSBP at your practice setting

Share your insight and recommendations with your medication safety officer or direct manager

Support a just culture

Report medication errors through your institutions voluntary event reporting system

References

1. Institute for Safe Medication Practices (ISMP). ISMP Mission and Vision. <https://www.ismp.org/about/mission#:~:text=Our%20Mission%3A%20Advancing%20patient%20safety,community%20to%20prevent%20medication%20errors>.
2. Institute for Safe Medication Practices (ISMP). ISMP Targeted Medication Safety Best Practices for Hospitals; 2022. <https://www.ismp.org/guidelines/best-practices-hospitals>.
3. Institute for Safe Medication Practices (ISMP). Education is “predictably disappointing” and should never be relied upon alone to improve safety; 2020 Jun 4. <https://www.ismp.org/resources/education-predictably-disappointing-and-should-never-be-relied-upon-alone-improve-safety>
4. Institute for Safe Medication Practices (ISMP). Your High-Alert Medication List—Relatively Useless Without Associated Risk-Reduction Strategies; 2013 Apr 4. <https://www.ismp.org/resources/your-high-alert-medication-list-relatively-useless-without-associated-risk-reduction>