

- MEDICATION SAFETY -

Preventing Medication Errors & Related Harm



Course Objectives:

After completing this module, the learner will be able to:

- State the SHC definitions of medication safety events (e.g., adverse drug events and medication errors).
- Describe at least one key medication safety strategy implemented regarding high risk medications.
- Describe how technology features currently implemented at SHC have improved patient safety.
- Explain the process for reporting an adverse drug event or medication error.

What is an adverse drug event (ADE)?



Definitions per P&P 43138.99:

Adverse Drug Event (ADE) is any harm, expected or unexpected, resulting from the use of a medication. This may also result from omission of a medication.

Examples include allergic reactions, hypotension, headache, nausea, vomiting, diarrhea

Potential Adverse Drug Event (PADE): A medication related event that has potential to cause harm to a patient but does not result in an injury.

**What is a
medication error?**



Medication Errors may be due to:

- The use of a **wrong plan** to achieve a medication goal

Examples:

- An excessive dose is ordered for a renal impaired patient
- A drug is ordered for a patient with a severe allergy to that drug

- The **wrong execution** of a medication plan

Examples:

- A drug is correctly ordered but is administered to the wrong patient due to a lapse in using proper patient identifiers
- An anticoagulant correctly ordered to prevent post-operative deep venous thrombosis fails to be given

[\(SHC Medication Safety Event Monitoring P&P 43138.99\)](#)

Examples of errors:

- HYDROmorphone (Dilaudid) 0.6 mg IV is given as a whole syringe of 1 mg because the MAR states: 0.6 mg (syringe)
- An IV medication is incorrectly infused epidurally because line tracing was not performed
- An insulin drip is mistakenly programmed at 22 units/hr instead of 2 units/hr due to an Alaris IV pump button press “bounce”
- Flexeril 5 mg (1/2 10 mg tablet) is given as 10 mg because no 5 mg tabs were made available and the transcription was unclear
- Insulin 5u is mistaken for 50 units.

Examples of errors:

- A CHF patient is discharged without a diuretic due to a misreading or misinterpretation of his Depart Summary resulting in pulmonary edema and readmission
- An anesthesiologist administers the incorrect drug IV because the syringe was not labeled when drawn up, then set aside for later use
- A Pyxis medication cabinet is restocked with the wrong PCA syringes because only one syringe's bar code was scanned, missing the fact that four other similar sized syringes contained a different drug
- Patient receives IV morphine 5x more concentrated than ordered because side by side verification was not done
- Two IV medication bags are mixed up due to look alike labeling and packaging

Medication errors occur at all medication process stages, as defined in [California Health and Safety Code 1339.63](#):

- **Prescribing**
- **Prescription Communication**
- **Product Labeling**
- **Packaging/Nomenclature**
- **Compounding**
- **Dispensing**
- **Distribution**
- **Administration**
- **Monitoring**
- **Education**
- **Use (overall)**

*Therefore,
EVERYONE is responsible for
preventing harm to patients
entrusted to Sharp:*

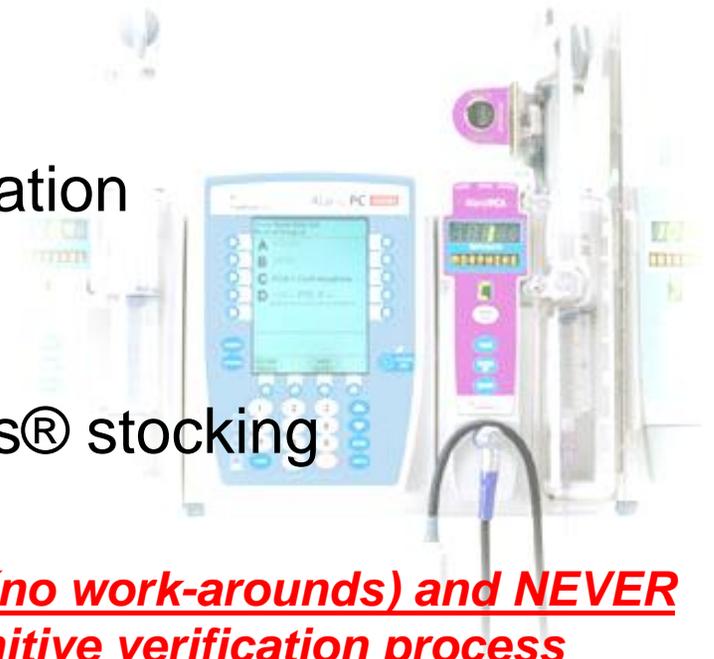
- *Physicians*
- *Pharmacists*
- *Pharmacy technicians*
- *Informaticists*
- *Nurses*
- *Laboratory personnel*
- *Dietitians*
- *Discharge planners*
- *Case managers*
- *Patients and their care partners*
- *Vendors*

SHC Medication Error Reduction Plan per site; on Sharpnet P&P and Pharmacy sites

Sharp continues to implement the latest safety technologies

Examples include:

- Alaris® IV Pumps and Guardrails® safety software
- Cerner Computerized Physician Order Entry (CPOE)
- Cerner medication barcoding
- Lexicomp® on-line drug information
- Pyxis® medication cabinets
- PARx® bar code scanned Pyxis® stocking



They are only effective when used as Intended (no work-arounds) and NEVER meant to replace your own visual and cognitive verification process

**How can I improve
medication safety?**



Medication Error Prevention...*What YOU can do!*

Respect at least these 6 basic medication rights:

- Right patient
- Right medication
- Right dose
- Right route
- Right time
- Right rationale/purpose



Refer to your site's leaders for any additional guidance as to patient rights. **See P&P 30035.99.**

Medication Error Prevention... *What YOU can do!*

Joint Commission National Patient Safety Goal (NPSG) **Accurately and completely reconcile medications across the continuum of care**

- Obtain information on the medications the patient is currently taking when admitted to the hospital or is seen in an outpatient setting
- Compare the medication information the patient brought to the facility with the medications ordered for the patient by the facility to identify and resolve discrepancies
- Provide the patient with written information on the medications the patient should be taking when discharged from the hospital or at the end of an outpatient encounter

Please refer to your work site for further details on realizing this goal.



Medication Error Prevention... **What YOU can do!**

Completing the Medication List History as a point of reference throughout the inpatient stay and at discharge.

- Prescription, over-the-counter (OTC), and herbal/alternative meds and dosages
 - *Time* of the last dose is IMPORTANT!
- Inquire regarding EVERY route of drug administration (e.g., patches, creams, eye and ear drops, suppositories, nasal sprays, insulin pumps, intrathecal pumps)
 - *Some patients incorrectly consider only oral products to be medications.*
- Adverse reactions to medications:
 - Allergies and other reactions which have limited the use of a specific medication in the past. *Be as explicit as possible. (e.g. hives instead of rash, nausea and vomiting instead of GI upset)*

Medication Error Prevention... *What YOU can do!*

Joint Commission National Patient Safety Goal (NPSG) Patient Identification

Use at least two identifiers for patients prior to administering medications.

Acceptable identifiers include:

- Patient's name, MR # or Account # (FIN), date of birth
- A photo ID is appropriate in some cases (e.g., SVP, SMV, GH Behavioral Health Service).

Note: Do NOT use the room number , phone numbers, or address as one of the two identifiers!

This requirement is not limited to the medication administration process:

- *Blood administration*
- *Lab testing*
- *Providing any other treatments or procedures*

Medication Error Prevention... *What YOU can do!*

Other sources to verify correct medication administration include:

- Patient arm/wrist band
- Medical record
- Medication Administration Records (MAR)
- Pyxis medication removal slips
- Pharmacy generated medication labels

Medication Error Prevention...*What YOU can do!*

Joint Commission Medication Management (MM) Verbal & Telephone Orders

Joint Commission requires we *read orders back* to the issuer:

1. ***Enter into CERNER*** immediately
2. ***Read it back from CERNER***
3. ***Get confirmation*** that it was understood correctly!
 - When in doubt, ask for further clarification:

Examples:

- Say “one-five milligrams” to distinguish 15 mg from 50 mg (“five-zero milligrams”).
- Do not use abbreviations of drug names (nitroglycerin or nitroprusside can be confused for nitro)

Medication Error Prevention... *What YOU can do!*

Joint Commission Medication Management (MM) High Risk Medications and Verification

High risk meds are those defined by the hospital as “being associated with an above average risk of ADEs, per [SHC “High Risk Medications” P&P 43160.01](#).”

- A core list of High Risk Meds are shared across all sites (e.g. insulin, erythropoetin, opioids, epidural infusions, heparins, warfarin, paralyzing agents, chemotherapy and pressors)
- Refer to your site’s High Risk Meds List for specific safety practices.
 - *Located in EVERY medication room*
 - *Found on Pharmacy SharpNet website*
- Please refer to site leadership for training and additional verification requirements, including Behavioral Health, Women’s Health, and NICU

Medication Error Prevention... **What YOU can do!**



Use Sharp's insulin reference cards on name badges and in med rooms!

- Cards compare the onsets & durations of action
- See your supervisor for the actual card and explanation of its usage
- Different formulations can be *VERY* confusing
- Read every label out loud, carefully, completely
- Compare MAR and medication vial
- Ask for independent verification
- **Don't hesitate to ask someone to double-check you!!**

[Refer to Sharp P&P 30339.99, for Insulin U-500 Use](#)

Medication Error Prevention... **What YOU can do!**

How should insulin be checked and prepared for administration?

- **CONFIRM** insulin type and dose to be given
 - Dosages: Is that a “4” or a “9”? Is that “2U” or “20”?
 - *Don't accept orders with “U” instead of “units”!*

- **PREPARATION:** label syringes after drawing up insulin with patient ID, drug name & dose
 - Treat one patient at a time: draw up, administer, document
 - Do not use ‘U’ for units

- **VERIFY:** Perform Independent Verification of all doses of IV insulin and SC U-500
 - *Check with site Nursing Leadership for any additional expectations.*

Medication Error Prevention... *What YOU can do!*

Insulin U-500: HIGH concentration

- **S:** U-500 (500 units per mL) is 5x more concentrated than the floor stock U-100
- **B:** U-500 is typically used for patients requiring >200 units per day due to reasonably small volume for SQ injection with U-500 formulation compared with U-100
- **A:** Medication mix-ups with U-500 are very dangerous and carry risk of severe hypoglycemia and death
- **R:** [The NEW SHC system wide U-500 Insulin P&P 30339.99](#) requires :
 - The “Insulin U500 (Highly Concentrated)” powerplan will always be used
 - A pharmacist will verify & document every U-500 patient’s home *and* discharge regimens
 - Pharmacy **NEVER** dispenses a U-500 vial to a patient care area
 - Pharmacy dispenses ready-to-use patient specific U-500 doses *in syringes*
 - Two pharmacists independently verify the dosage, labels, and MAR
 - Two nurses will perform independent verification of the order, dose, volume

Please refer to the U-500 Insulin P&P for all the procedural details

Medication Error Prevention...*What YOU can do!*

OPIOIDS

Top problematic example... **HYDR**Omorphone (Dilaudid)

Morphine is ***NOT*** HYDR**Omorphone!**

Safety Pearl!

Morphine **5** mg IV = only **1** mg IV HYDR**Omorphone**

Note: The Pyxis Speed Bump Alert for HYDR**Omorphone** reminds the end user of the great difference vs morphine. *Right drug? Dose?*

You have selected HYDROmorphone** (Dilaudid). Correct?
*2 MG/ML STRENGTH **EQUIVALENT TO 10 MG MORPHINE**

Medication Error Prevention... *What YOU can do!*

OPIOIDS (continued)

Names:

Roxanol, Roxycodone, Oxycodone, Oxycontin, MS Contin...

...and oxycodone, hydrocodone, codeine!!

These names are easily confused!

Safety Pearl!

Oxy**contin** is **contin**uously released thus is a long acting formulation

Don't hesitate to ask someone to Side By Side verify with you!!

Medication Error Prevention... **What YOU can do!**

Other High-Risk meds include:

- **Cancer Chemotherapy Agents:**
 - **NEVER** accept verbal/telephone orders except in *true* emergencies
 - Independently verify all IV doses and
 - Independently verify first oral doses and side by side verify all the following doses during the remainder of the patient's course of therapy
- **Anticoagulants:**
 - **Heparin Drips**
 - Independently verify and check dose against orders and last PTT
 - **Warfarin**
 - Orders can change frequently; check transcriptions closely, monitor trends in INR, monitor bruising and bleeding!
- **Paralyzing Agents:**
 - Read the label **OUT LOUD** to avoid fatal errors!
 - Be careful to avoid confirmation bias

Confirmation Bias

What is Confirmation Bias?

- If you hold the belief a medication is correct you're more likely to overlook look-alike/sound-alike drugs leading to medication errors
- This can be due to similar drug packaging or similar drug names

TIPS to avoid Confirmation Bias:

- Read medication name **OUT LOUD**
- Get an independent verification from a colleague
- **LOOK** for *Tall Man Lettering* on the MAR, then compare exact spelling side by side
- Be skeptical; assume it's wrong until you confirm it's right

Every letter counts in a drug name!

Only smart people can read this. I couldn't believe that I could actually understand what I was reading.

The phonemic power of the human mind, according to a research at Cambridge University, it doesn't matter in what order the letters in a word are, the only important thing is that the first and last letter be in the right place. The rest can be a total mess and you can still read it without a problem. This is because the human mind does not read every letter by itself, but the word as a whole. Amazing huh? Yeah and I always thought spelling was important! if you can read this pass it on!!

Dugrs taht look too mcuh akile

acetoHEXAMIDE - acetaZOLAMIDE
ALPRAZolam - LORazepam
amLODIPine – aMILoride
azaCITIDine – azaTHIOprine
buPROPion - busPIRone
ceFAZolin – cefTRIAxone
CeleBREX* – CeleXA*
chlorproMAZINE – chlordiazePOXIDE
chlorproMAZINE – chlorproPAMIDE
CISplatin – CARBOplatin
clomiPHENE – clomiPRAMINE
clonazePAM – cloNIDine
clonazePAM - LORazepam
cloNIDine – Klonopin*
cycloSPORINE - cycloSERINE
DACTINomycin – DAPTOmycin
DAUNOrubicin – DOXOrubicin
More...

Pharmacy incorporates FDA and other recommended naming conventions that are designed to make easily confused drug names more obviously DIFFERENT.

(All are correctly spelled!)

***“How can I contribute?”
Please report to Pharmacy any drug name pairs which you fear could easily be mistaken for each other in your practice... before mix-ups occur.***

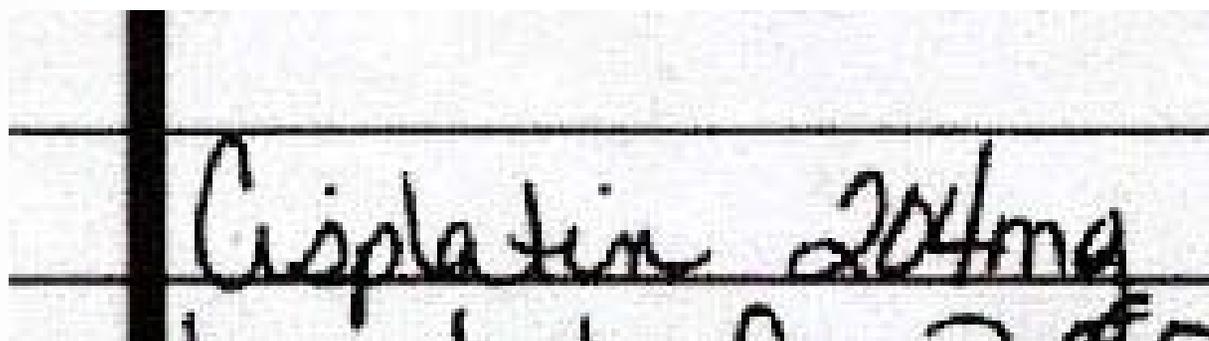
What's wrong with this picture?



- Manufacturers often use similarly appearing label formats on several products (e.g. fonts, colors)
- **AVOID confirmation bias!** When your brain knows what to look for (small vial with red label and white cap) it can often overlook drug name due to similar packaging leading to errors
e.g Enalaprilat is for high blood pressure, Pancuronium is a paralyzing agent!!

Other medication error examples:

Missing the point entirely!



A line may interfere with the observation of a decimal point. The order for 20.4 mg of Cisplatin (chemotherapy) was interpreted as 204 mg, resulting in a ten fold overdose and death.

SAFER!...Make sure the decimal point is OBVIOUS!



Does **NOT** Prevent Errors

- Barcoding does not make errors “magically disappear.”
- **IF USED CORRECTLY, it does prevent errors from reaching the patient**
- This is because barcoding does NOT change the way we:
 - Prescribe medications.
 - Prepare medications.
 - Dispense medications.
 - And EVEN administer medications (i.e. review of the patient rights).
- Many things can still go wrong (please see the following examples).





Error #1: IVP WRONG Volume (e.g., mL)

WHY is Wrong Volume not detected?

- Scanning the barcode only tells the nurse that the product in her hand matches the MAR order.
- To administer, the nurse must enter the DOSE (e.g., mg).
- However, the volume (e.g., mL) field is *NOT* scanned for accuracy, even if left blank.
- **ACTION: Always check your math; enter the volume**



Error #2: Manually Applied Labels

WHY is a Wrong Manual Label NOT detected?

- Someone put the wrong label on the wrong drug.
- The scanner reads only the label's bar code against the MAR order.
- YOU must verify whether the label is on the right matching drug for that MAR order.
- **ACTIONS:**
 - **ALWAYS** check the actual med and compare it to the MAR
 - Reading the drug name and strength on the label and product **OUT LOUD** can help detect mismatches.



Error #3: Same PRN vs Scheduled Med

WHY is Wrong Scheduling not detected?

- Barcoding can only detect whether you have selected the correct medication based on the MAR order.
- If a patient is receiving the same medication on a scheduled as well as "prn" basis, barcoding will NOT automatically know which of the two options you are administering.
- **ACTIONS:**
 - **ALWAYS double check that the medication on the CERNER screen during barcoding is the one that you are intending to administer.**
 - **If NOT, you must manually assign the correct medication order**



Error #4: Med Barcode Wizard Does Not Populate

What can happen?

- Once in a while medication barcodes scanned will not be noted on the Medication Wizard.
- The nurse will receive NO visual cue that the medication was NOT successfully scanned.
- **ACTIONS:**
 - **ALWAYS** check computer screen for "blue check mark".
 - If no "blue check mark" appears, it means that the medication was NOT confirmed and must be re-scanned.
 - Inform pharmacy and/or the TAC when this occurs.

Alaris Guardrails Safety

“What is Alaris Guardrails and why should I use it?”

- Guardrails is a drug library within the Alaris pump which contains dosing limits specific to care areas, e.g. OB, Specialty Units, Oncology
- Guardrails contains dose calculations and alerts that will alarm when you have bypassed a safety limit.
- ***NOTE: Basic Infusion mode provides NONE of these protections to prevent or catch programming errors!***

Alaris Guardrails Safety

“Why can’t I find a drug in Guardrails?”

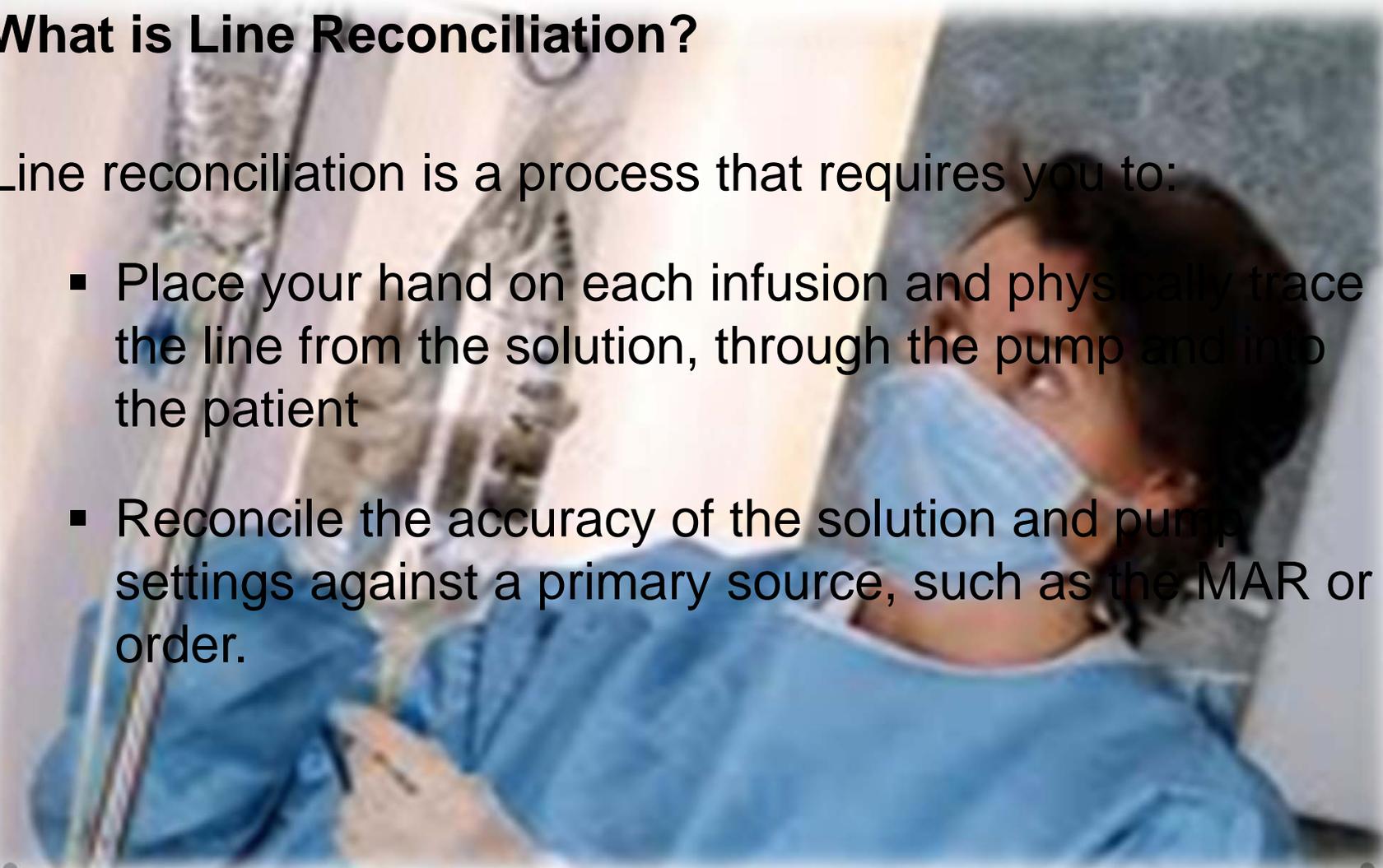
- Ask an experienced co-worker for help; all drugs are entered by generic name
- Refer to the [Sharpnet Alaris Smart Pump System Resources website](#) where you’ll find:
 - SHC data on medications causing the most alerts
 - Quick lists of available Guardrails drugs and 1) whether a Bolus can be given, and 2) Dosage limits
- Need a medication added to the Alaris pump?
 - Contact Alaris@Sharp.com with the request for drug addition

Line Reconciliation: Right Drug and Route

What is Line Reconciliation?

Line reconciliation is a process that requires you to:

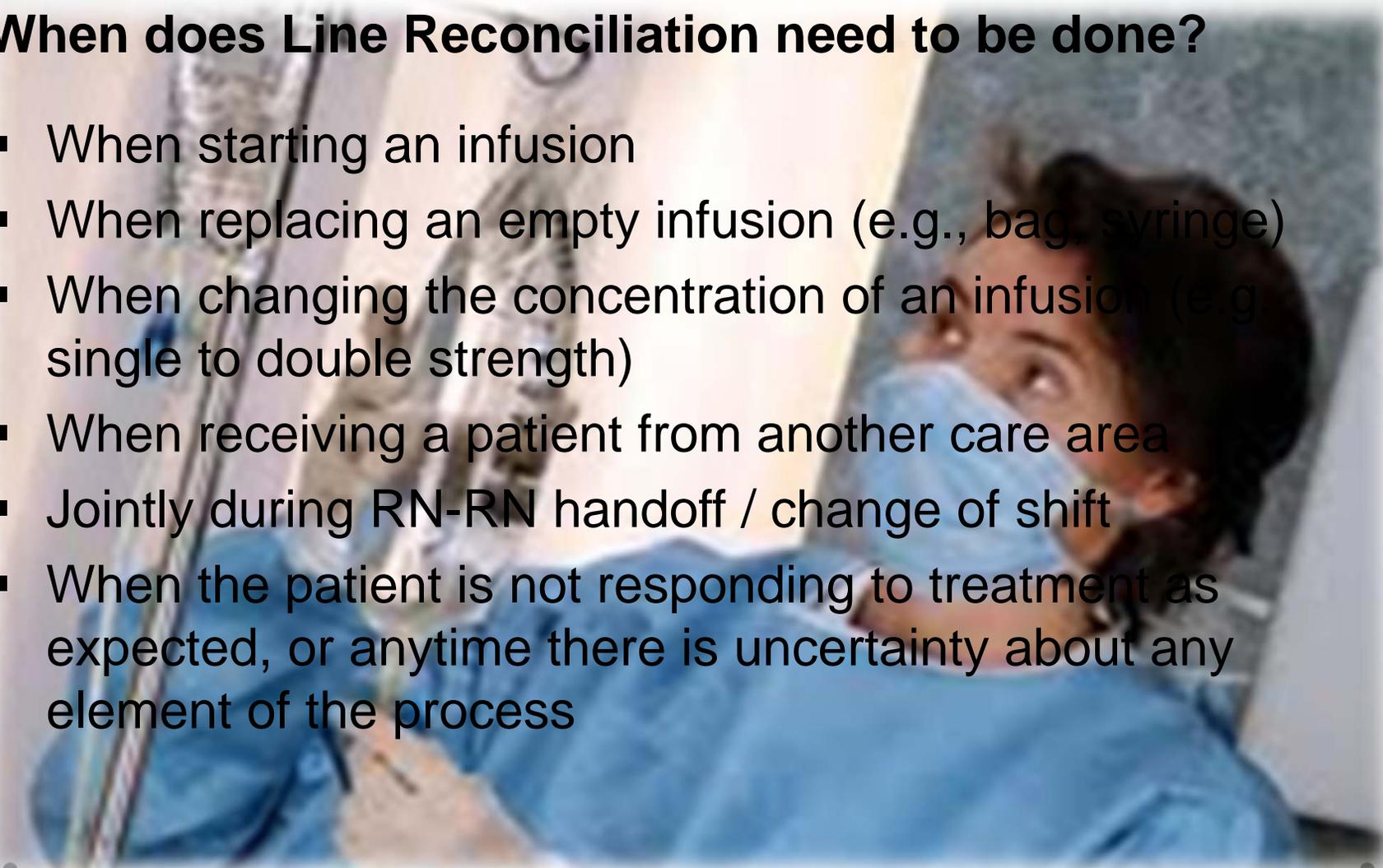
- Place your hand on each infusion and physically trace the line from the solution, through the pump and into the patient
- Reconcile the accuracy of the solution and pump settings against a primary source, such as the MAR or order.



Line Reconciliation: Right Drug and Route

When does Line Reconciliation need to be done?

- When starting an infusion
- When replacing an empty infusion (e.g., bag, syringe)
- When changing the concentration of an infusion (e.g., single to double strength)
- When receiving a patient from another care area
- Jointly during RN-RN handoff / change of shift
- When the patient is not responding to treatment as expected, or anytime there is uncertainty about any element of the process



Why is Line Reconciliation Important?

You may **SAVE A LIFE** by tracing infusion lines and catching these kinds of errors which should **NEVER** happen:

- ***An EPIDURAL bupivacaine infusion accidentally connected to an INTRAVENOUS site could cause immediate asystole (cardiac standstill) and DEATH.***
- ***An ENTERAL feeding solution accidentally connected to an INTRAVENOUS site could cause DEATH.***

Can **YOU** think of other possible infusion misconnections, considering all the lines connected to patients for a variety of unrelated purposes? Reconciliation is quick and easy.



**What if an event
happens despite my
best efforts?**



Why do We Report Errors?

The purpose of reporting is to guide institutional process improvements to prevent recurrences with another patient or a fellow care provider

- **Proactive:** By reporting 'near misses' we can correct system failures before they reach the patient
- **Concurrent:** By reporting errors as they occur we can mitigate harm and take immediate corrective action
- **Retrospective:** By reporting errors that have happened, we can conduct Root Cause Analysis (RCA) and identify system causal factors for correction

Management and Reporting

Medication Safety Event management consists of:

- Take care of the patient - ***MOST IMPORTANT STEP!***
- Notify the physician of the event
- Report event via eQVR system (protected and confidential)

Management and Reporting

Reporting consists of:

- *Complete an eQVR on Sharpnet when an error has occurred or when there is a potential harm should the error re-occur [SHC Quality Variance Report \(QVR\) P&P 16005.99](#).*
- Tell your pharmacist and/or manager of the event
- Utilize the Medication Safety Reporting Hotline, if available (788-DRUG* or 858-499-DRUG) to verbally report *harmless* errors or conditions that may lead to errors

***Dialing 9 is not necessary to call 788-DRUG from within Sharp facilities**