Disclosures

The presenters have no real or perceived conflicts of interest related to content in this presentation

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Learning Objectives

At the end of this session, participants should be able to:

1. Recall The Joint Commission's best practice recommendations for smart pump infusion device safety.

2. Identify strategies and obstacles for successful standardization of medication infusion concentrations at the facility level and across a large national health system.

3. Recognize proactive processes to improve the safety and efficiency of smart infusion device wireless drug library updates within a multi-hospital organization.

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Steward Health Care

- Largest private, tax-paying health care network in U.S.

- Founded and led by physicians

- Mandate: to create a fully integrated, scalable model that leads to high-quality, efficient health care

- Passionate focus on high-quality care, innovative services and community commitment

- Strive to reduce barriers to accessing high-quality, comprehensive, compassionate care

Source: Image property of Steward Health Care. Not for reuse without permission of Steward Health Care.

Large Private Health Care System

31
HOSPITALS

25+
URGENT CARE
CENTERS

107
PREFERRED SKILLED
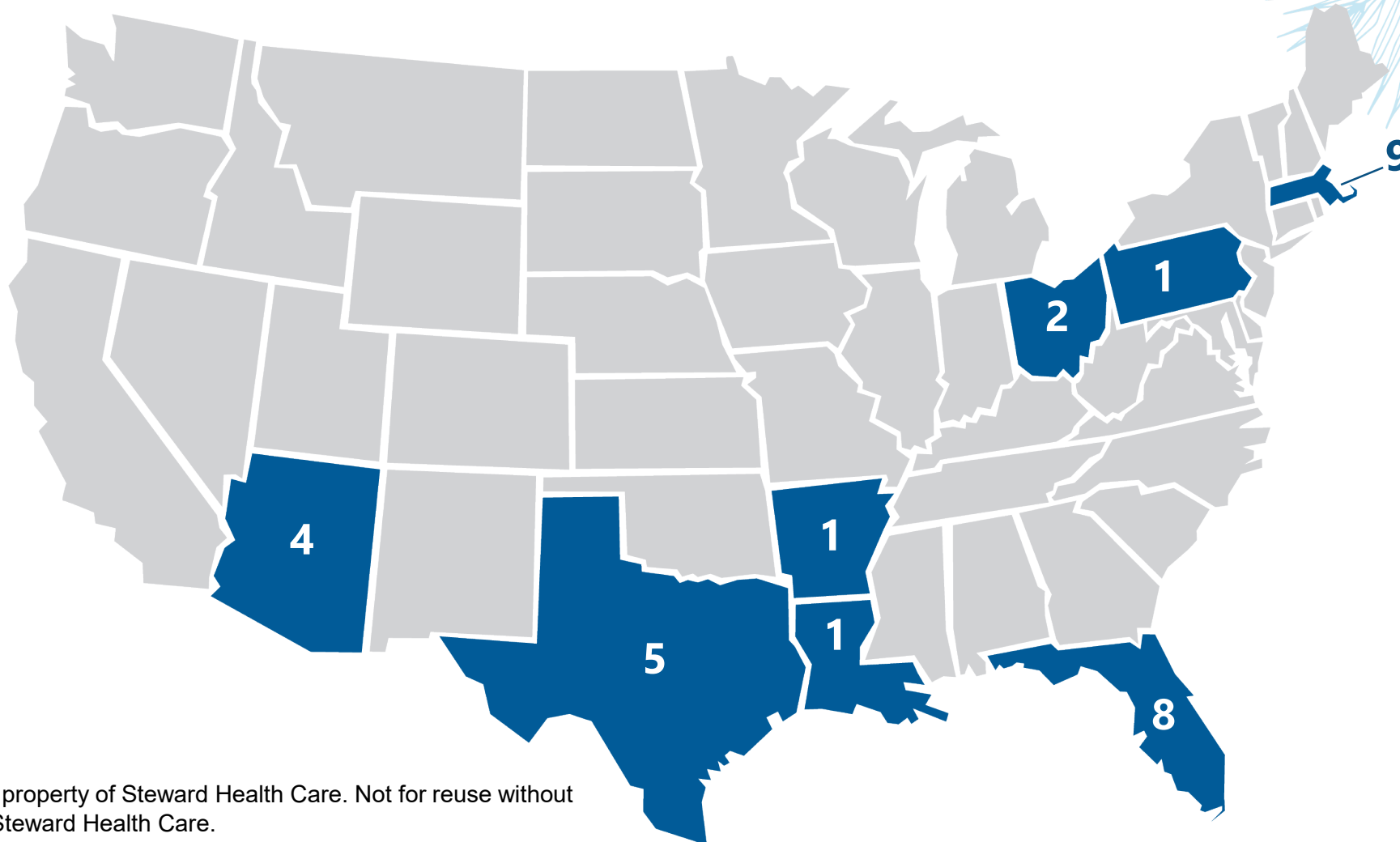NURSING FACILITIES

4,641
PHYSICIANS
1,531 (SMG)
3,110 (affiliates)

30,000
TEAM
MEMBERS

7,900+
BEDS UNDER
MANAGEMENT

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Steward Health Care Hospitals

Source: Image property of Steward Health Care. Not for reuse without permission of Steward Health Care.

Current State of Smart Infusion Devices

Pharmacist-centric management
- Nursing end-users often not included in the management process

Variability in hospitals with and without integration
- Drug library build context differences

Lack of clear guidance for drug library safety elements
- Variances in safety limits

Nursing turnover in a post-COVID era
- End-user experience with lack of consistency across the nation

Source: Alamer F, Alanazi A.T. *Cureus* 2023;15(3): e36007
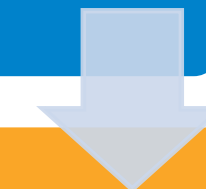
Infusion Device Management
Key Elements

ISMP and TJC recommendations for routine updating of smart pump drug library

Outdated and EHR-misaligned drug libraries can result in serious patient harm

Wireless drug library update delays are significant and widespread due to technology limitations and poor processes

Sources: The Joint Commission (TJC). *Jt Comm J Qual Patient Saf* 2021;47(6):394-397.
Institute for Safe Medication Practices (ISMP). *ISMP* 2020;1-37.

Management
TJC Best Practices

Identify

- Identify a team responsible for smart infusion pump management

Define

- Define a process to create, test and maintain a drug library

Hardwire

- Standardize drug library elements
- Ensure uniform updates to pumps

Source: The Joint Commission. *Jt Comm J Qual Patient Saf* 2021;47(6):394-397.

Assessment Question #1

TJC SEA 63 Best Practices include ALL of the following except:

A. Identify a team responsible for smart infusion pump management

B. Implement infection control standards for pump cleaning

C. Ensure uniform updates to pumps

D. Define a process to create, test and maintain a drug library

Answer: Question #1

TJC SEA 63 Best Practices include ALL of the following except:

A. Identify a team responsible for smart infusion pump management

B. <mark>Implement infection control standards for pump cleaning</mark>

C. Ensure uniform updates to pumps

D. Define a process to create, test and maintain a drug library

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Drug Library
TJC Best Practices

Standardize and limit drug concentrations

Establish care areas and standardize nomenclature

Safety limits: Alerts when pump is programmed outside limits

Source: The Joint Commission. *Jt Comm J Qual Patient Saf* 2021;47(6):394-397.

Safety
TJC Best Practices

Train and assess competency of all clinical staff

Make use of dose error reduction software expected practice

Monitor alerts, overrides, recalls and adverse event reports

Source: The Joint Commission. *Jt Comm J Qual Patient Saf* 2021;47(6):394-397.

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Infrastructure
TJC Best Practices

EHR-Pump interoperability if possible

Identify and address human and environmental factors

Keep pumps safe from downtime and security threats

Source: The Joint Commission. *Jt Comm J Qual Patient Saf* 2021;47(6):394-397.

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Identify Infusion Device Committee Members

NURSING

PHARMACY

EDUCATORS

INFORMATICS
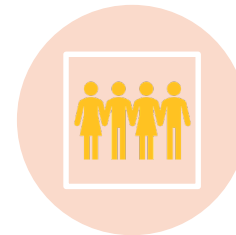
BIOMED

Source: Institute for Safe Medication Practices 2020. https://www.ismp.org/guidelines/safe-implementation-and-use-smart-pumps

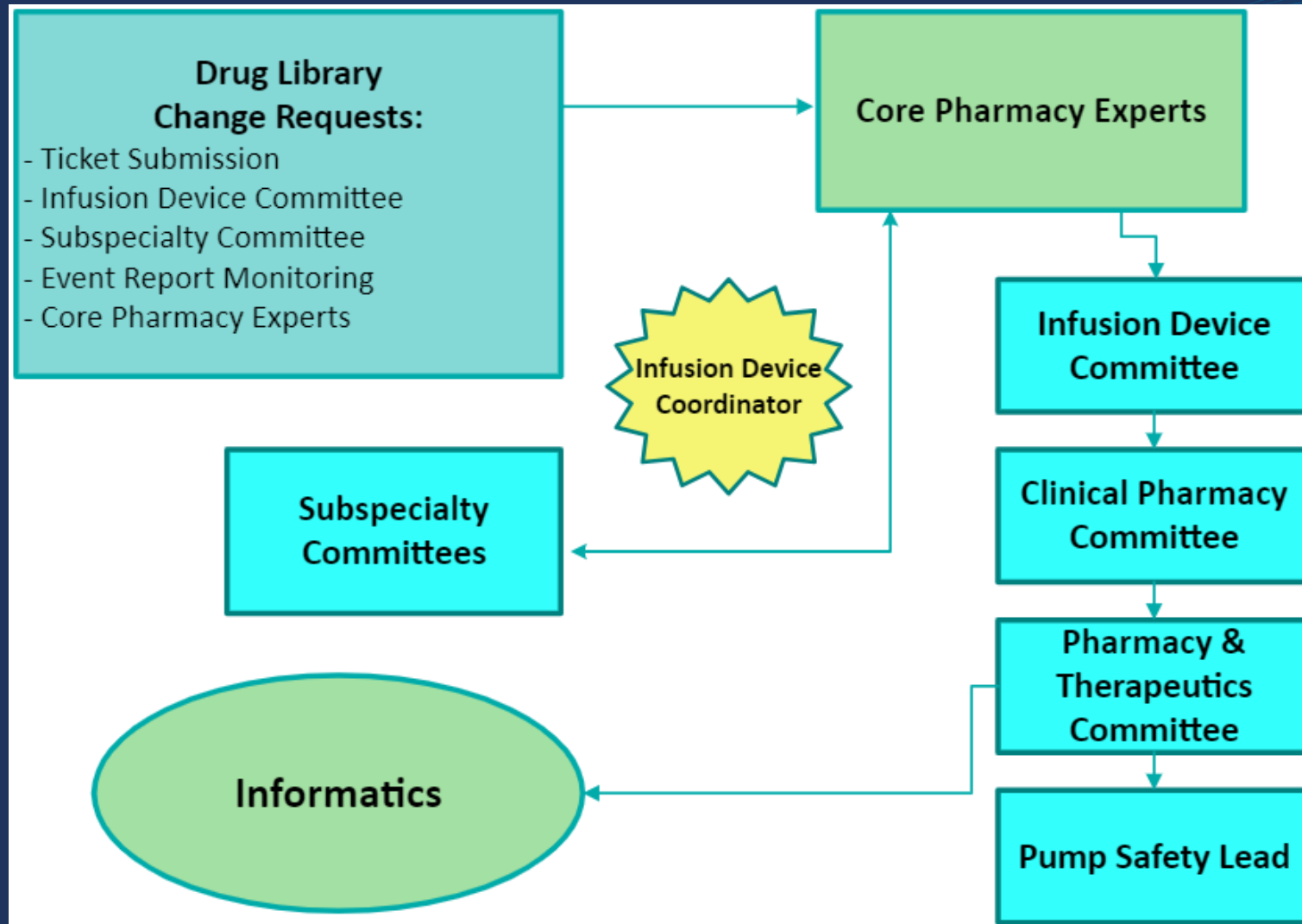**CE Credit Deadline: 09/30/24**

Nurses Are KEY

- Primary stakeholders

- End-user experience

- Alternative perspectives

- Engagement essential for safety initiative buy-in

Source: Institute for Safe Medication Practices 2020. https://www.ismp.org/guidelines/safe-implementation-and-use-smart-pumps
Image Source: Getty images. Used with permission of HealthTrust.

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Source: Image property of Steward Health Care. Not for reuse without permission of Steward Health Care.
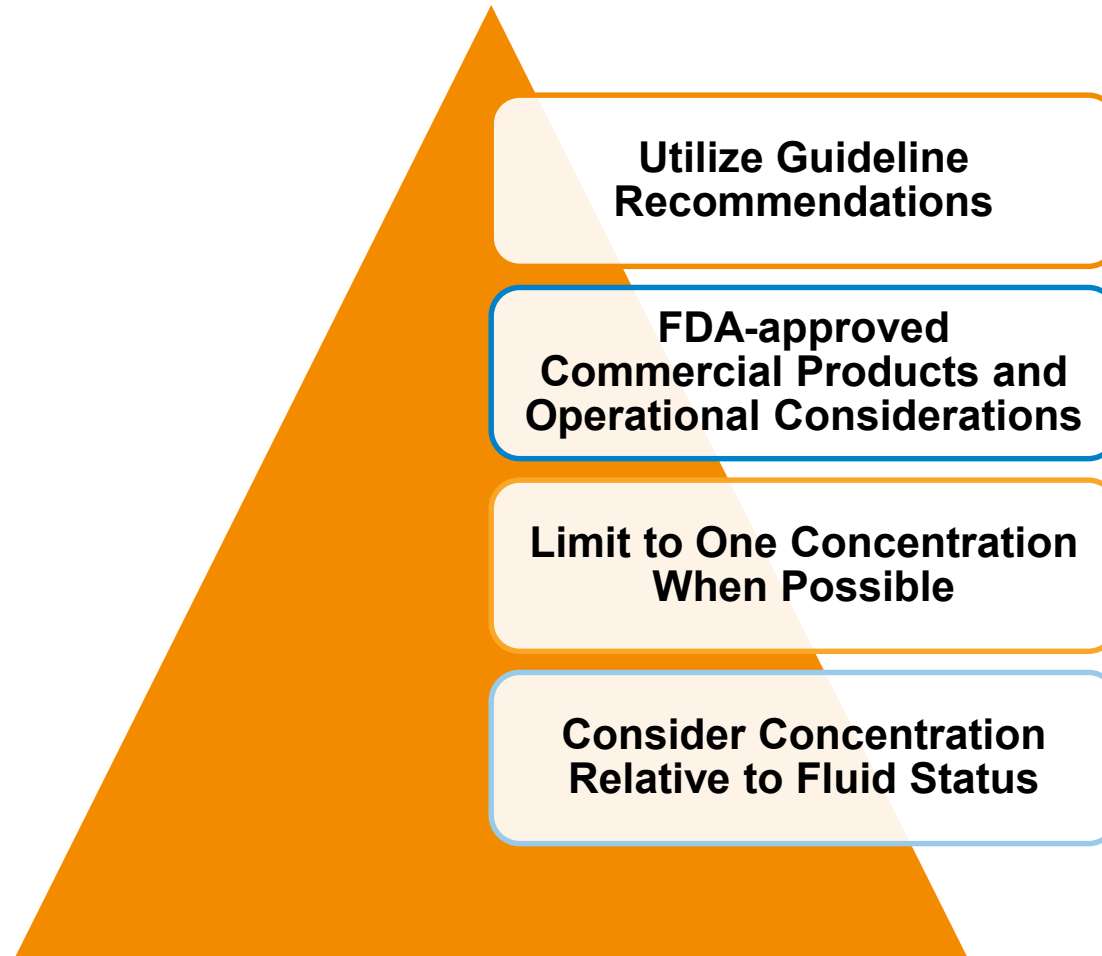
Hardwire
Standardize Drug Library

Drug Concentration Standardization

Dosing Unit Standardization

Additional Programming Elements

Source: Institute for Safe Medication Practices 2020. https://www.ismp.org/guidelines/safe-implementation-and-use-smart-pumps

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Principles for Infusion Standards

Utilize Guideline Recommendations

FDA-approved Commercial Products and Operational Considerations

Limit to One Concentration When Possible

Consider Concentration Relative to Fluid Status

Sources: Institute for Safe Medication Practices 2020. https://www.ismp.org/guidelines/safe-implementation-and-use-smart-pumps
American Society of Health-System Pharmacists. https://www.ashp.org/Pharmacy-Practice/Standardize-4- Safety-Initiative.

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Limit Continuous Infusion Concentrations

Standardize to a single drug concentration when possible

Identify drugs that may need more than one concentration

Vasopressors and antihypertensives

Source: Institute for Safe Medication Practices 2020. https://www.ismp.org/guidelines/safe-implementation-and-use-smart-pumps

Assessment Question #2

Which of the following strategies has demonstrated to be effective for successful standardization of medication infusion device concentrations?

A. Limit to a single concentration where possible

B. Utilization of guideline recommendations

C. Consideration of commercial availability of products

D. All of the above

Answer: Question #2

Which of the following strategies has demonstrated to be effective for successful standardization of medication infusion device concentrations?

A. Limit to a single concentration where possible

B. Utilization of guideline recommendations

C. Consideration of commercial availability of products

D. <mark>All of the above</mark>

Concentration and Dosing Unit Standardization

- Engage with pharmacy leads

- Assess operational dispensing current state vs. future state

  o Provide/compare worksheets

- Meetings with pharmacy leads

  o Assess progress

  o Address concerns and obstacles

  o Support in the process

- Provide stakeholder communication template

Source: Institute for Safe Medication Practices 2020. https://www.ismp.org/guidelines/safe-implementation-and-use-smart-pumps

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Additional Programming Elements

Care Areas

Tailored to specific patient populations

Standardize Nomenclature

Develop a standardization guide

Safety Limits (DERS)

Keystroke error potential

Source: The Joint Commission. *Jt Comm J Qual Patient Saf* 2021;47(6):394-397.

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Develop Standardization Rules

Drug Library Safety Standards & Style Guide

Introduction

1) The Drug Library consists of a <u>Master Drug List</u> for drug generic names.
- An "alternate name" can be defined.
- "Clinical Advisories" are added at the Master Drug level.

2) Each individual <u>Drug Entry is</u> then built out beginning with selecting a Master Drug, and then adding data such as drug concentration and infusion rate (for Continuous Infusions) or infusion time (for intermittent drug infusion over time or "<u>DOT</u>")

As a rule, the INFUSOMAT pump Drug Library is intended to align with the EHR (i.e., Meditech)in terms of how drug names and drug doses are described.
- When the Meditech entry does not match the desired style or other entry, a Meditech edit can be considered – so long as the result is that they are in harmony.
- Some pump style is not EHR dependent (more detail is noted below).

GENERIC DRUG NAME ORGANIZATION
- All medications are listed by generic name using all lowercase unless using tall man letters (see below)
- Medication names listed should match how they appear in the EHR (i.e., Meditech) or the medication label.
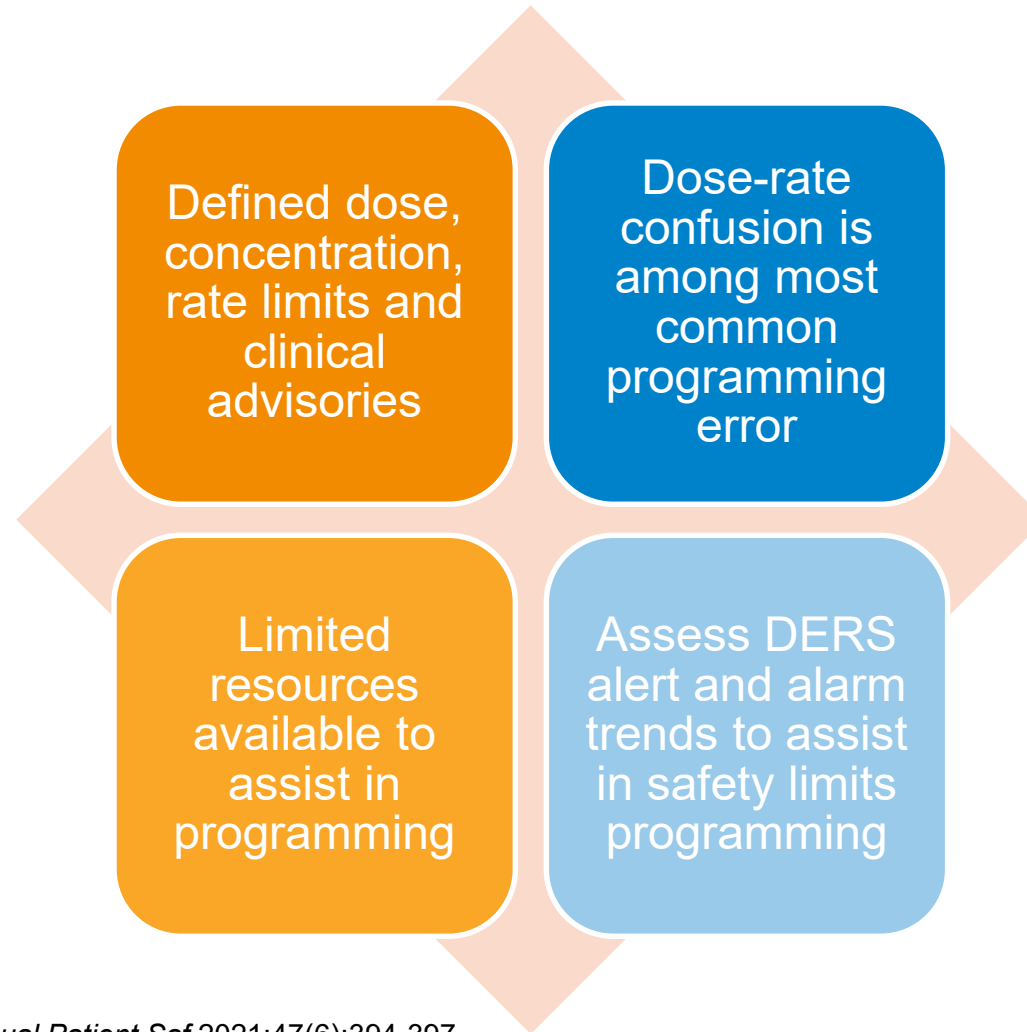
Master Drug Rules
- Do NOT use the same Master Drug Route for Subcategory builds for adults and Peds.
- Anytime a library entry will be copied, a new unique Master Drug should be created FIRST, if the drug name will be different

Source: The Joint Commission. *Jt Comm J Qual Patient Saf* 2021;47(6):394-397.

Dose Error Reduction Software Optimization

Defined dose, concentration, rate limits and clinical advisories

Dose-rate confusion is among most common programming error

Limited resources available to assist in programming
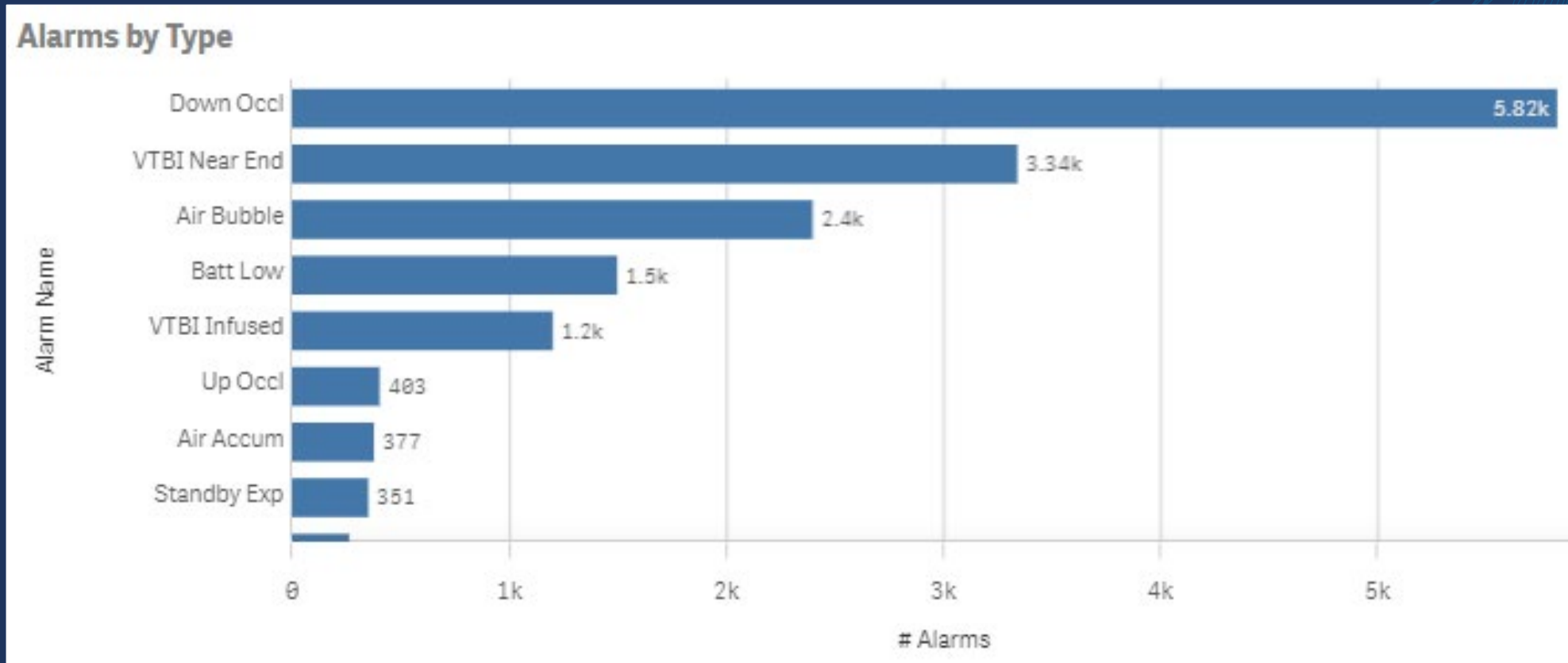
Assess DERS alert and alarm trends to assist in safety limits programming

Sources: The Joint Commission. *Jt Comm J Qual Patient Saf* 2021;47(6):394-397.
Institute for Safe Medication Practices 2020. https://www.ismp.org/guidelines/safe-implementation-and-use-smart-pumps
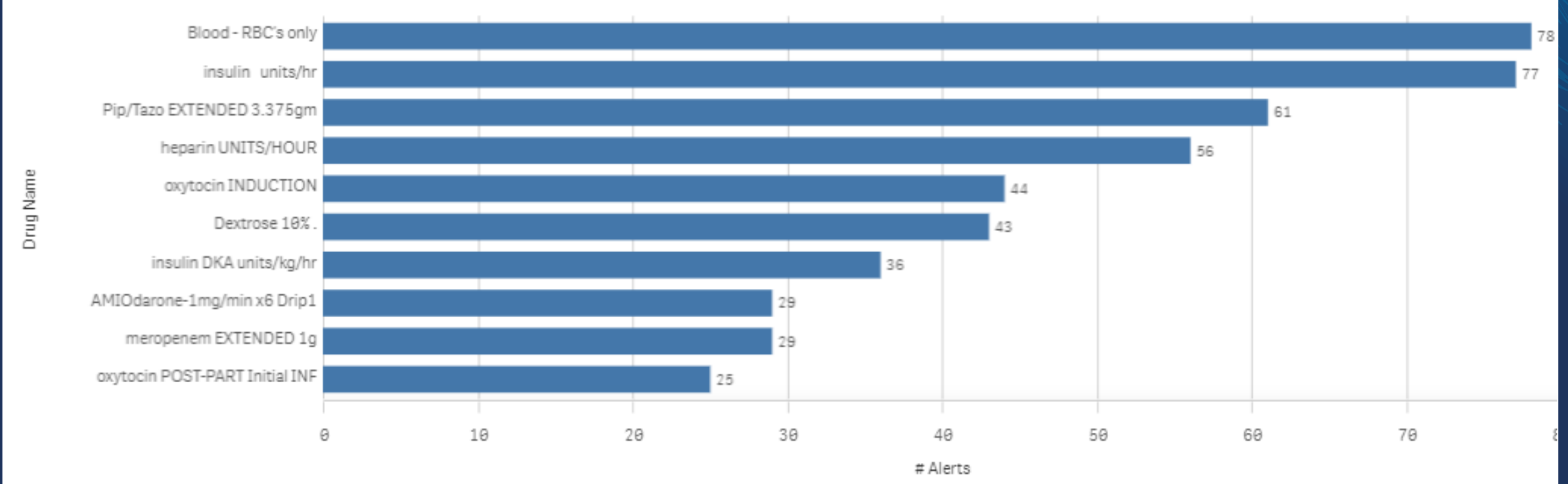
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Analyze Alarm Trends

Source: Steward Health Care DoseTrac via QlikSense. Not for reuse without permission of Steward Health Care.

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Analyze Alert Trends

Source: Steward Health Care DoseTrac via QlikSense. Not for reuse without permission of Steward Health Care.
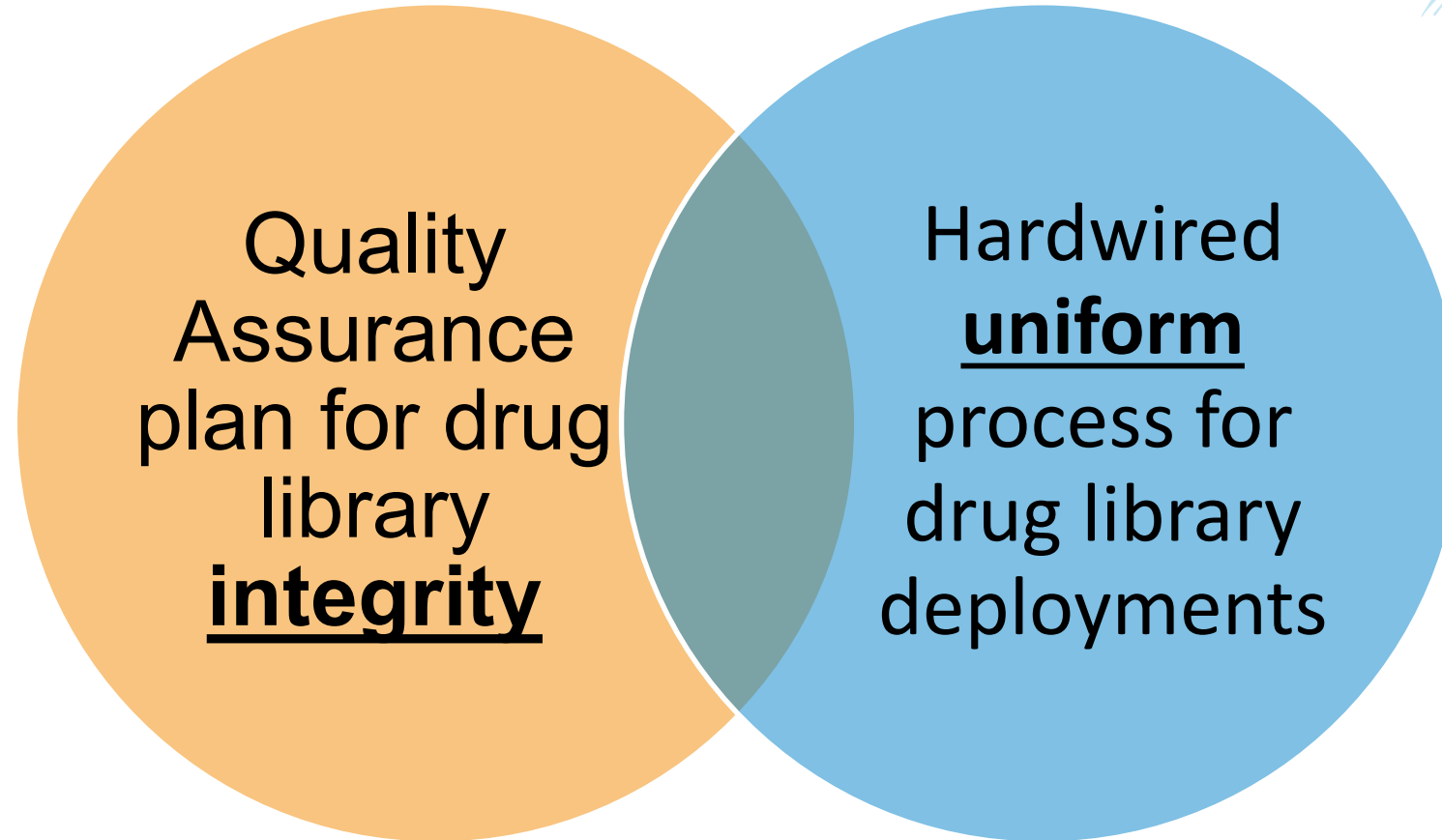
DRUG LIBRARY DEPLOYMENT

WHOA,

PUMP THE BRAKES!!

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Zero-harm Philosophy

Quality Assurance plan for drug library **integrity**

Hardwired **uniform** process for drug library deployments
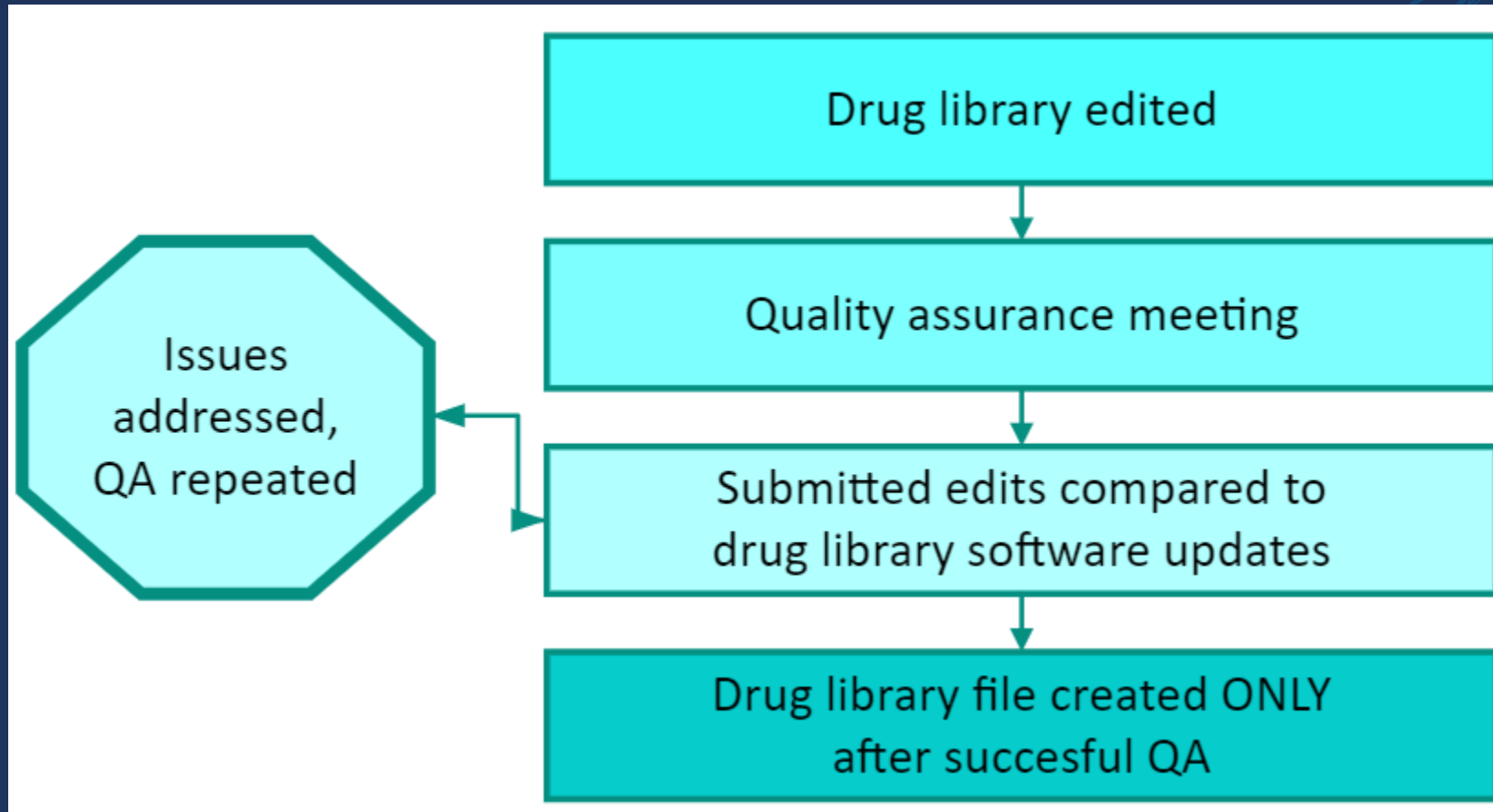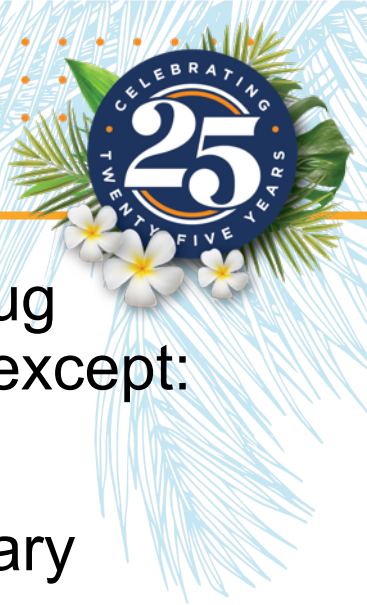
Sources: DeLaurentis P, Hsu KY, Bitan Y. *Am J Health-Syst Pharm* 2018; 75(15):1140-1144.
Hsu KY, DeLaurentis P, Bitan Y, et al. *J Patient Saf* 2019;15(1):e8-e14.

Quality Assurance (QA) Process
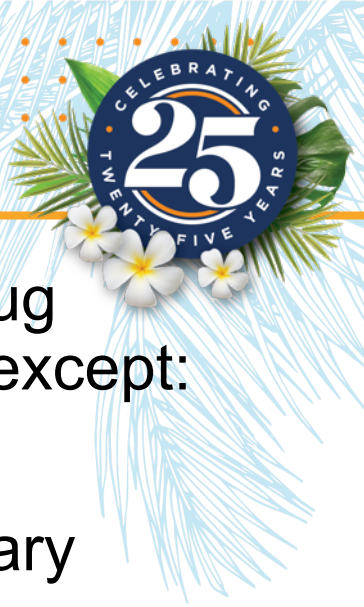
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Assessment Question #3

All of the following should be completed prior to drug library deployment to support a zero-harm culture except:

A. Establish a quality assurance plan for drug library integrity

B. Develop a process for uniform drug library deployments

C. Compare submitted edits to the edited drug library software prior to creating the drug library file

D. Poll pharmacists to assess best time of day for drug library deployment
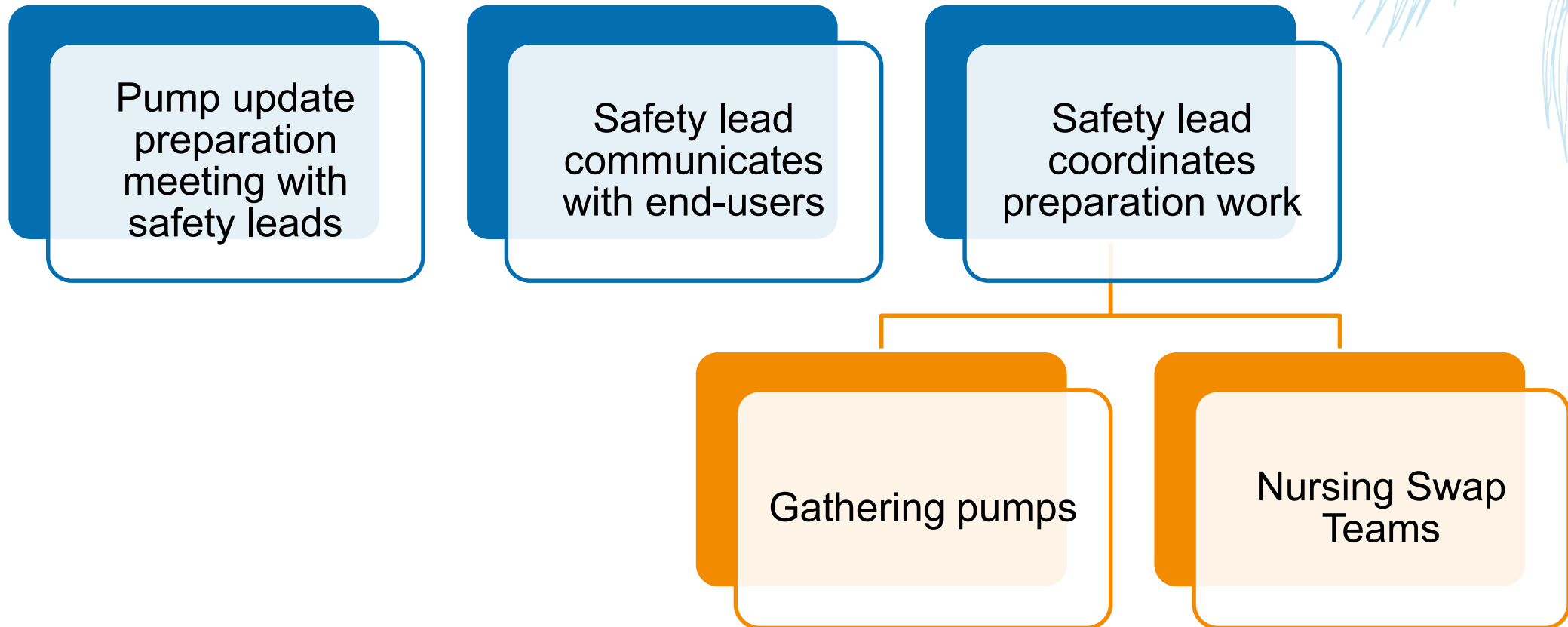
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Answer: Question #3

All of the following should be completed prior to drug library deployment to support a zero-harm culture except:

A. Establish a quality assurance plan for drug library integrity

B. Develop a process for uniform drug library deployments

C. Compare submitted edits to the edited drug library software prior to creating the drug library file

D. Poll pharmacists to assess best time of day for drug library deployment

Drug Library Deployment Planning
1-2 Weeks Prior

Pump update preparation meeting with safety leads

Safety lead communicates with end-users

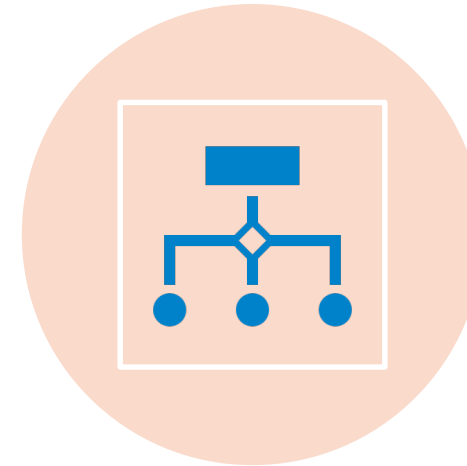Safety lead coordinates preparation work

Gathering pumps

Nursing Swap Teams

Source: LeFever NC, Martin E, Small J, Drelick J, Vitoux R (2022). Improving Smart Pump Drug Library Upload Success Using a Best Practice Approach.

| **CE Credit Deadline: 09/30/24**

Nursing Swap Teams

Teams of 1–2 nurses for day of update

Swap pumps to ensure all pumps receive the update

Source: LeFever NC, Martin E, Small J, Drelick J, Vitoux R (2022). Improving Smart Pump Drug Library Upload Success Using a Best Practice Approach.

Drug Library Deployment Planning
1-3 Days Prior

Reminder from safety lead to stakeholders

Continued coordination of preparation work

Confirmation of Swap Teams

Source: LeFever NC, Martin E, Small J, Drelick J, Vitoux R (2022). Improving Smart Pump Drug Library Upload Success Using a Best Practice Approach.

CE Credit Deadline: 09/30/24

Drug Library Deployment Planning
Day of Update

Confirmation of deployment time is communicated by Pharmacy Informatics

Drug library is deployed

Deployment success is officially confirmed by Pharmacy Informatics

Source: LeFever NC, Martin E, Small J, Drelick J, Vitoux R (2022). Improving Smart Pump Drug Library Upload Success Using a Best Practice Approach.

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Nursing Pump & Swap Activity
Day of Update

| Teams travel from unit to unit | → | New drug library pumps swapped for old pumps | → | Pumps tagged as updated |

Source: LeFever NC, Martin E, Small J, Drelick J, Vitoux R (2022). Improving Smart Pump Drug Library Upload Success Using a Best Practice Approach.

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Pump Update TAT Data Review

Aim to demonstrate improvement in drug library upload success

Three acute care hospitals from 3 U.S. regions and data collected following two separate drug library pushes in July and Oct. 2021
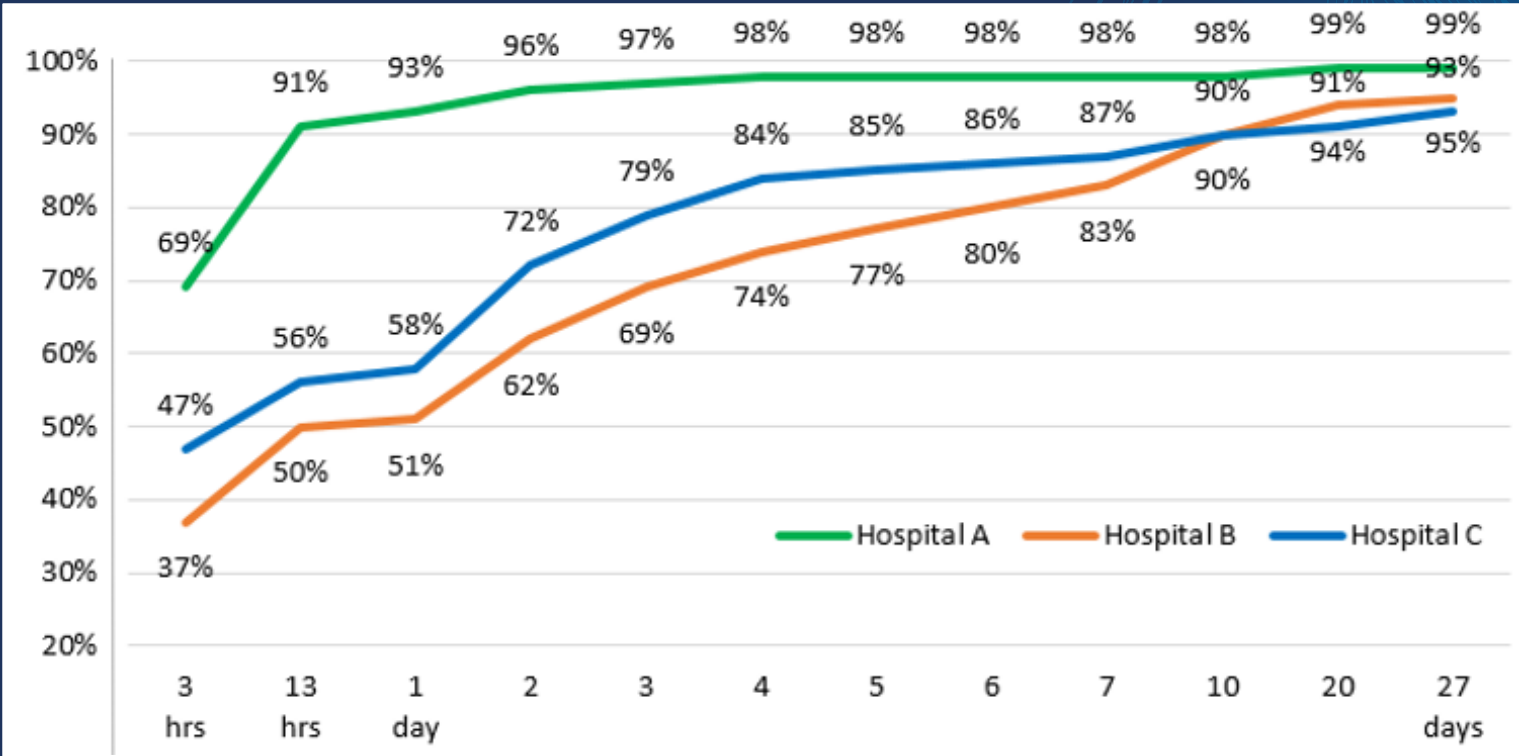
Pre-intervention baseline and post-intervention data analyzed

Source: LeFever NC, Martin E, Small J, Drelick J, Vitoux R (2022). Improving Smart Pump Drug Library Upload Success Using a Best Practice Approach.

Baseline Pre-intervention

New Library Upload Success

Pump Fleet %

Source: LeFever NC, Martin E, Small J, Drelick J, Vitoux R (2022). Improving Smart Pump Drug Library Upload Success Using a Best Practice Approach.
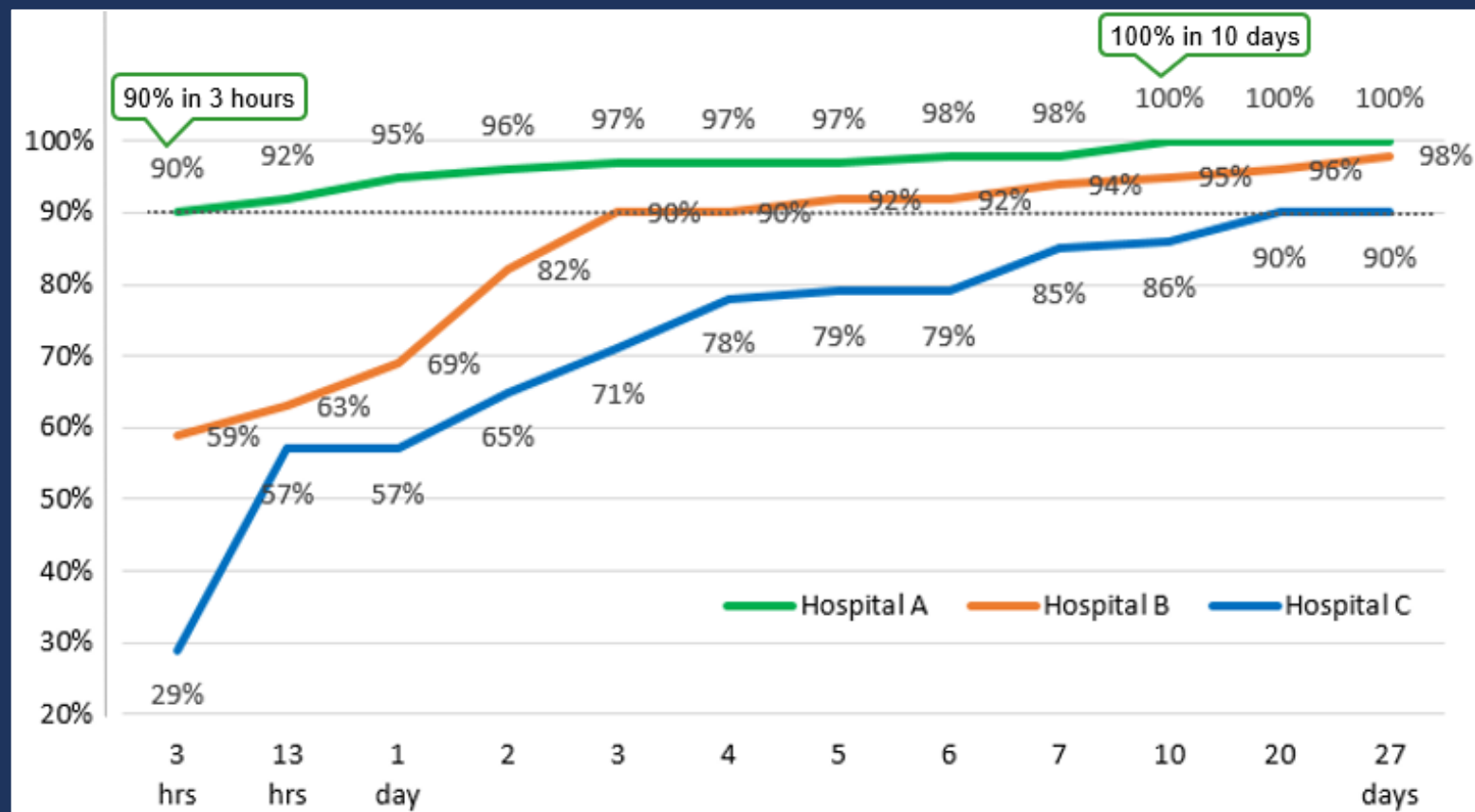
Results Post-intervention

New Library Upload Success

Pump Fleet %

Source: LeFever NC, Martin E, Small J, Drelick J, Vitoux R (2022). Improving Smart Pump Drug Library Upload Success Using a Best Practice Approach.

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Data Review Summary

- Multidisciplinary engagement is vital

- Identify a facility lead to oversee pump safety
  - Nurse is best

- Nursing engagement and buy-in is critical to success
  - Hospital A excelled due to strong engagement of nursing leaders and front-line staff
  - Hospital C struggled with nursing engagement, resulting in a longer time to achieve our 90% goal

Source: LeFever NC, Martin E, Small J, Drelick J, Vitoux R (2022). Improving Smart Pump Drug Library Upload Success Using a Best Practice Approach.

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Safety Monitoring Post-Deployment

- Monitor progress of drug library update

- Report out progress to the team post-deployment

- Establish a category in event reporting system for infusion device-related errors

- Review details of events with multidisciplinary committee

- Incorporate event action plans into future drug library updates

Source: Institute for Safe Medication Practices 2020. https://www.ismp.org/guidelines/safe-implementation-and-use-smart-pumps

Key Take-home Points

- Infusion device management and safety can be improved by implementing The Joint Commission's best practice recommendations

- Standardization of drug library programming should be a fundamental practice to improve infusion device safety as outlined by ISMP

- A consistent process for drug library deployments can significantly improve safety by minimizing pumps with outdated libraries

References
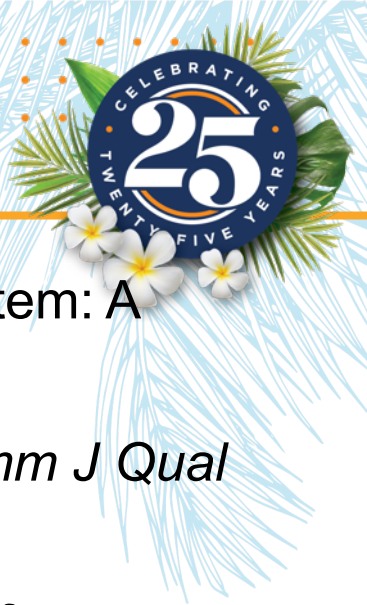
1. Alamer F, Alanazi A T. The impact of smart pump technology in the healthcare system: A scope review. *Cureus* 2023;15(3): e36007.

2. Sentinel Event Alert 63: Optimizing smart infusion pump safety with DERS. *Jt Comm J Qual Patient Saf* 2021;47(6):394-397.

3. Institute for Safe Medication Practices (ISMP). *ISMP Guidelines for Optimizing Safe Implementation and Use of Smart Infusion Pumps*.
   ISMP 2020. https://www.ismp.org/node/972

4. Hsu KY, DeLaurentis P, Bitan Y, et al. Unintended patient safety risks due to wireless smart infusion pump library update delays. *J Patient Saf* 2019;15(1):e8-e14.

5. DeLaurentis P, Hsu KY, Bitan Y. Prevalence of wireless smart-pump drug library update delays. *Am J Health-Syst Pharm* 2018;75(15):1140-1144.

Thank you...

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