



# 2022-2023 Educational Webinar Series

## IV Pumps Integration: Lessons Learned

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**Speaker:**

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**Manager Medication Safety Integration**

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# About the Moderator



**Juuso Leinonen**

**Principal Project Engineer  
ECRI**

Juuso Leinonen is a Principal Project Engineer, at the Device Evaluation group at ECRI, where he performs comparative medical device evaluations and investigates medical device related accidents. His current subject-matter expertise includes infusion technology, medical device cybersecurity, and telehealth.

# Logistics

- ❖ All attendees are muted during the presentation.
- ❖ Questions to the panelists must be submitted via the “Q&A” feature in Zoom at any time. They will be addressed at the Q&A portion.
- ❖ If there is any urgent issue, please use the “chat” feature to communicate with the host/moderator.
- ❖ Please remember to complete the webinar evaluation after attending. A link will be provided at the end.

# About the speaker



**Tina M. Suess MHA, BSN, RN-BC, CPHIMS, CPPS**  
**Manager Medication Safety Integration**

Tina Suess is the Manager, Medication Safety Integration at Penn Medicine - Lancaster General Hospital in Lancaster, PA. She earned a Diploma in Nursing from the Lancaster General Hospital School of Nursing and an Associates Degree in Science from Franklin and Marshall College. In 2009, she obtained her BSN from the University of Phoenix and her Masters in Health Administration in 2013.

For the past 19 years, her focus has been on medication safety ensuring adoption and accountability. She serves as a liaison between pharmacy, nursing, and information services ensuring a patient centric approach to the use of medication safety technology.

Tina has assisted Lancaster General Hospital in achieving two ASHP Best Practice Awards. The 2005 ASHP award was centered on the use of direct observation and barcode technology to reduce medication errors. The 2009 award involved IV interoperability integrating smart infusion pumps to be programmed directly from the medication order. The Institute for Safe Medication Practice awarded Tina a Cheers Award in 2020 for her efforts on smart pump integration.

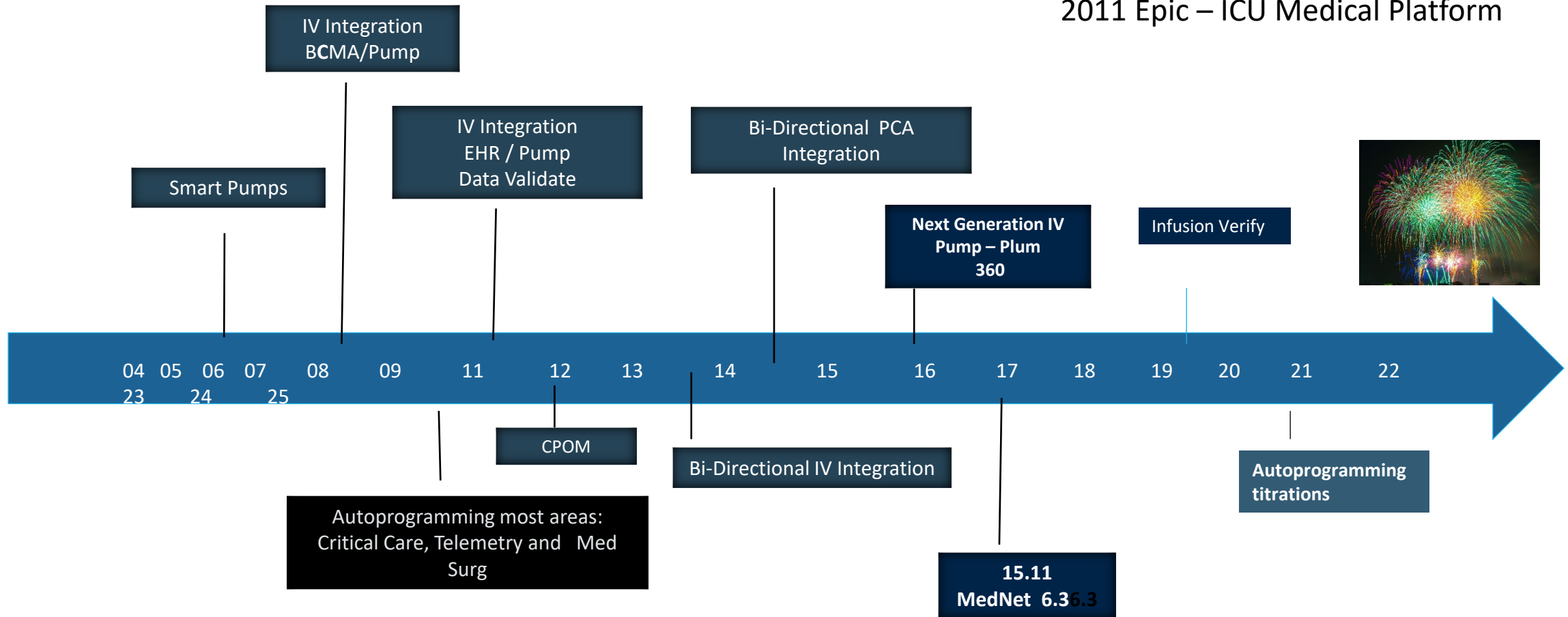
# Session Description

Infusion pump integration, also referred to as infusion pump interoperability, refers to technologies that enable the creation of an electronic connection between an infusion pump channel and an electronic medical record (EMR) system. This electronic connection can be leveraged to improve patient safety and support clinical documentation workflow. Infusion pump interoperability functionality is now available from most pump vendors and many healthcare organizations have started their interoperability journey. However, achieving infusion pump interoperability is no easy feat but rather a complex endeavor requiring testing and on-going resources beyond just the initial implementation phase.

Join this ACCE Educational Webinar to learn more about infusion pump interoperability and hear lessons learned from a healthcare facility's infusion pump interoperability journey.

# 14 Years of Smart Pump Integration

2011 Epic – ICU Medical Platform



# What is Smart Pump Integration?

- Taking everything contained within the infusion order and populating that information onto the pump without the clinician manually programming
- Taking everything that happens on the device and displaying in EHR for documentation
- Many names
  - Autoprogramming
  - Smart Pump Integration
  - Interop
- Pump is now an extension of the medication order!
- From EHR to the Pump
  - SAFETY
  - Elements of the IV Order “autopopulate” the pump
    - Drug
    - Concentration
    - Dose/Rate
    - Volume to be infused
    - Patient Weight
- From Pump to EHR(Infusion Verify)
  - Brings efficiency and transparency
    - Documentation of events that have already happened on pump
    - Volume (what pump has actually pumped)
    - What is the role of this in infusion safety?

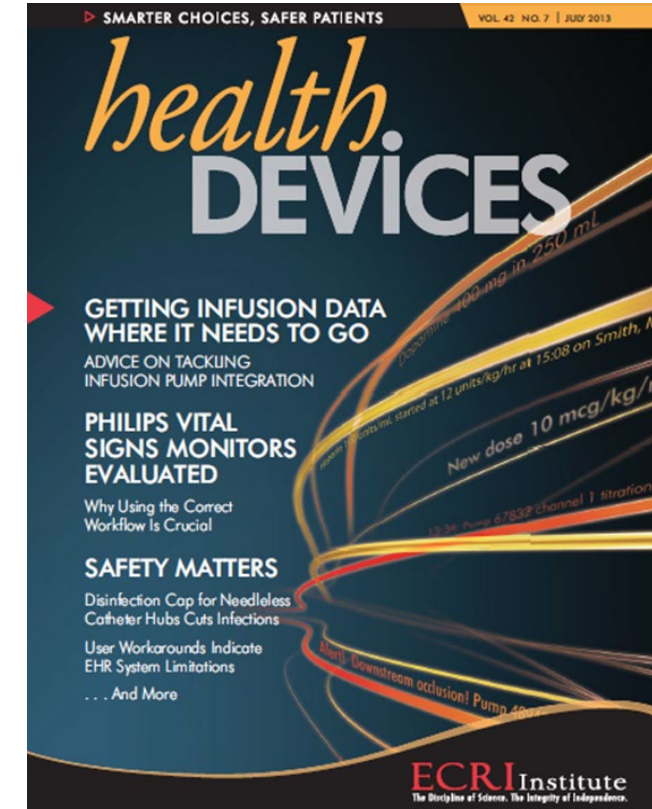


# Why is Smart Pump Integration Needed ?

- Power in “linking” the infusion device to the medication order
  - Pumps can be programmed with guardrails or the drug library engaged – but does not ensure pump is programmed to match provider order
  - Eliminate the human variability in programming infusion pumps

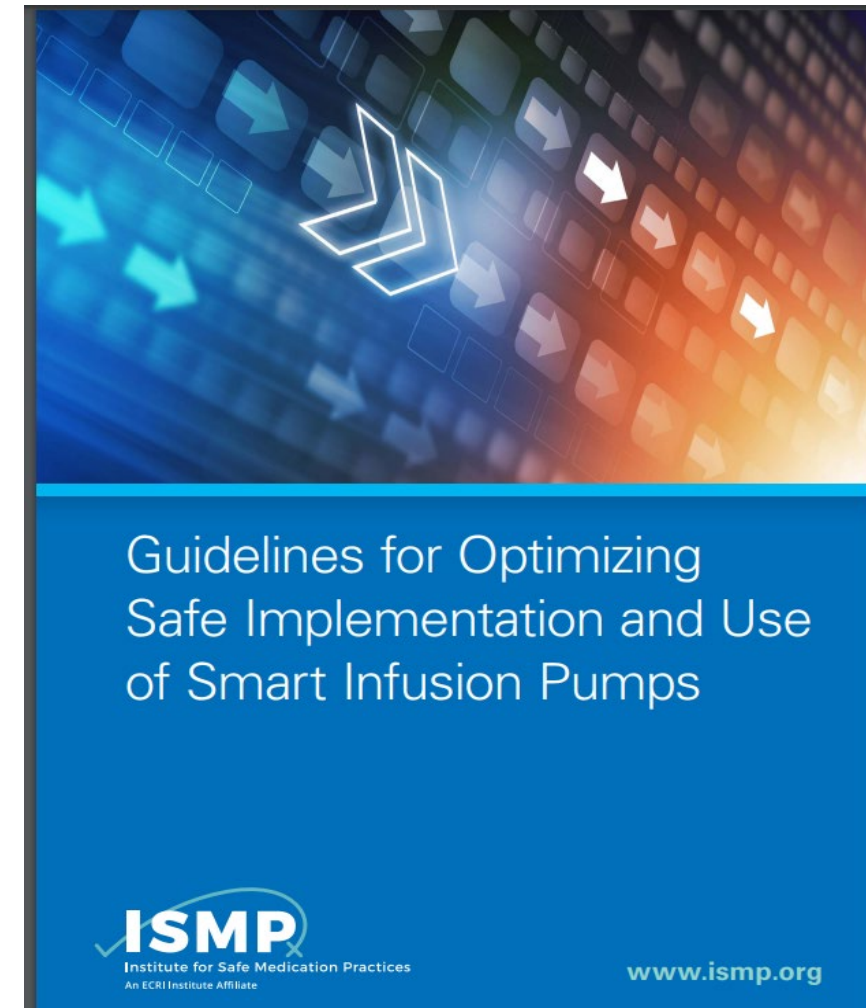
Problem	Number reported	Addressed by smart pump drug libraries?	Addressed by pump integration?
Wrong concentration	29	No	Yes
Wrong entry of more than one parameter	19	Yes, if it triggers an alert	Yes
Secondary (piggyback) infusion setup error	15	No	No
Wrong weight	8	No	Yes
Wrong rate	8	Yes, if it triggers an alert	Yes
Pump is not turned on	6	No	No*
Wrong drug	6	No	Yes
Set is not connected to patient	4	No	No
Wrong dose	1	Yes, if it triggers an alert	Yes

\* Integrated pumps use Integrating the Healthcare Enterprise’s Point-of-Care Infusion Verification (IHE PIV) messaging, which, while not enabling a pump to be turned on automatically, includes the capability for the pump server to return an error message to the BPOC system indicating that the pump is not turned on.



# 2020 ISMP Recommendation

- 1.10. Implement bi-directional SMART PUMP INTEROPERABILITY with the electronic health record (EHR) within the next five to seven years.



# Pump Programming Steps

## Manual Process (17 steps)

- Scan patient
- Scan medication and complete required fields
- Manually document in eMAR/BCMA

Program pump:

- Select CCA
- Select line
- Press drug list
- Scroll to find medication
- Press standard program
- Select dosing units
- Enter concentration (3 steps)
- Enter weight
- Enter dose
- Enter volume to be infused
- Press start
- Select 'Yes' to confirm

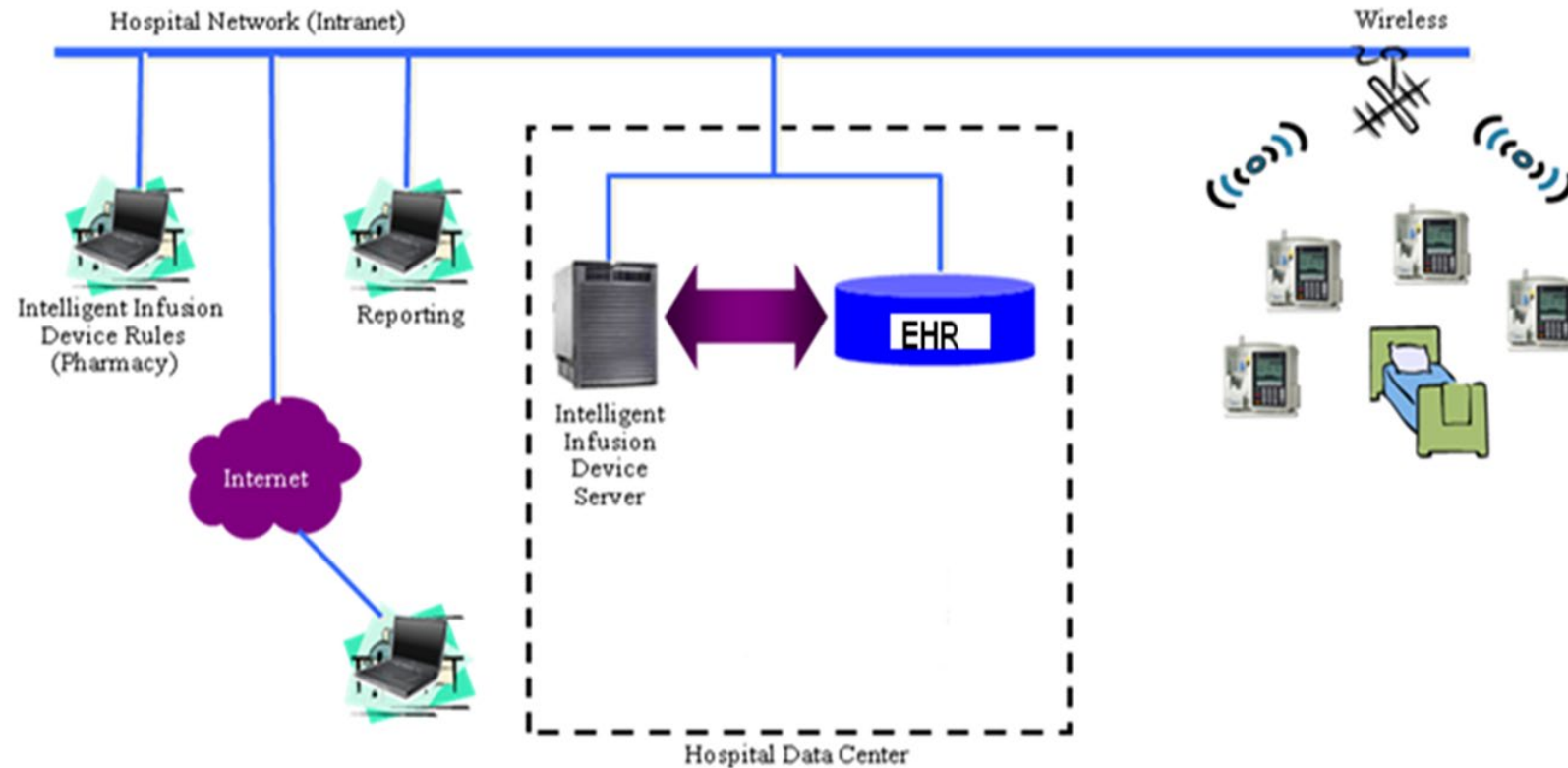
## Auto-programming (7 steps)

- Select CCA
- Scan patient
- Select CCA
- Scan patient
- Scan Medication
- Scan channel barcode
- Send to pump
- Press Start
- Select Yes to Confirm

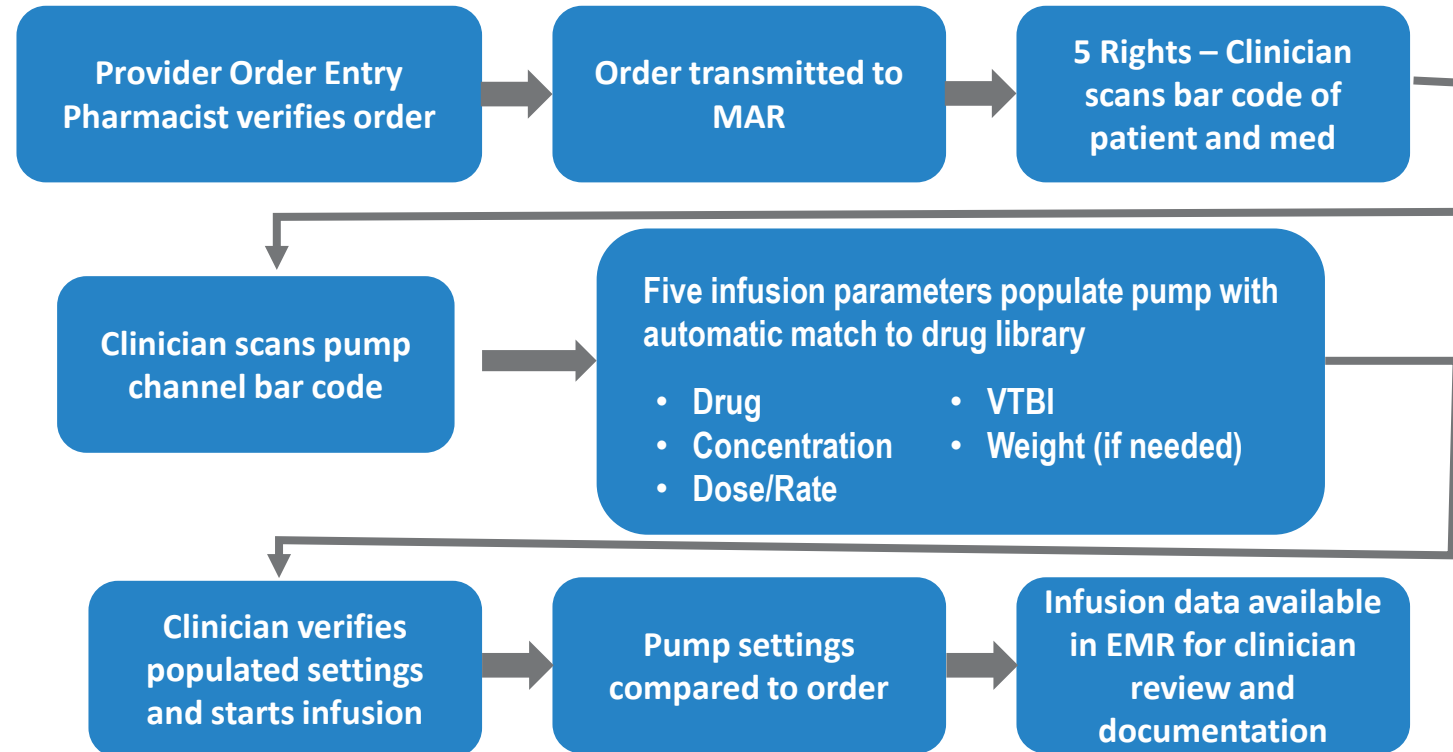
# Not All Smart Pump Integration is the Same

- Must understand the capability of your integrated platform
  - Different pump vendors have different capabilities at the pump level
    - New bag, rate change, subsequent bag, fluid bolus
    - Must the med be in the drug library
    - Must the pump be on a certain screen
  - Different EHR vendors have different capabilities
- Bi-directional integration
  - Order from EHR can program infusion pump (safety)
  - Information from the pump can “flow back” to EHR.
- Auto-documentation
  - Only information from the pump can flow back to EHR.

# Technology - How the Info is Moved



# Auto-Programming Workflow



# Side by Side Mismatch

- Checks how the pump is programmed compared to the MAR

The screenshot shows a software interface with a tab labeled 'Administration Details'. A dialog box titled 'Pump Communication' is open, featuring a red diamond warning icon. Below the title bar, there is a visual representation of a computer monitor, a red diamond warning icon, and a pump icon. The main content of the dialog box is a table comparing MAR and Pump values for a specific medication. The table has two columns: 'MAR' and 'Pump'. The medication is 'phenylephrine in NaCl 0.9% (NEO-SYNEPHRINE) 50 mg/250 mL Infusion- VESICANT'. The 'Dose' row shows '20 mcg/min' for MAR and '200 mcg/min' for Pump, with a red diamond warning icon next to the Pump value. The 'Rate' row shows '6 mL/hr' for MAR and '60 mL/hr' for Pump, with a red diamond warning icon next to the Pump value. At the bottom of the dialog box, there are three buttons: 'Use Pump Values', 'Resend Details', and 'Cancel'.

**⚠️ MAR and pump do not match**

phenylephrine in NaCl 0.9% (NEO-SYNEPHRINE) 50 mg/250 mL Infusion- VESICANT

	MAR	Pump	
Dose	20 mcg/min	200 mcg/min	⚠️
Rate	6 mL/hr	60 mL/hr	⚠️

→ Use Pump Values    📄 Resend Details    ✖ Cancel

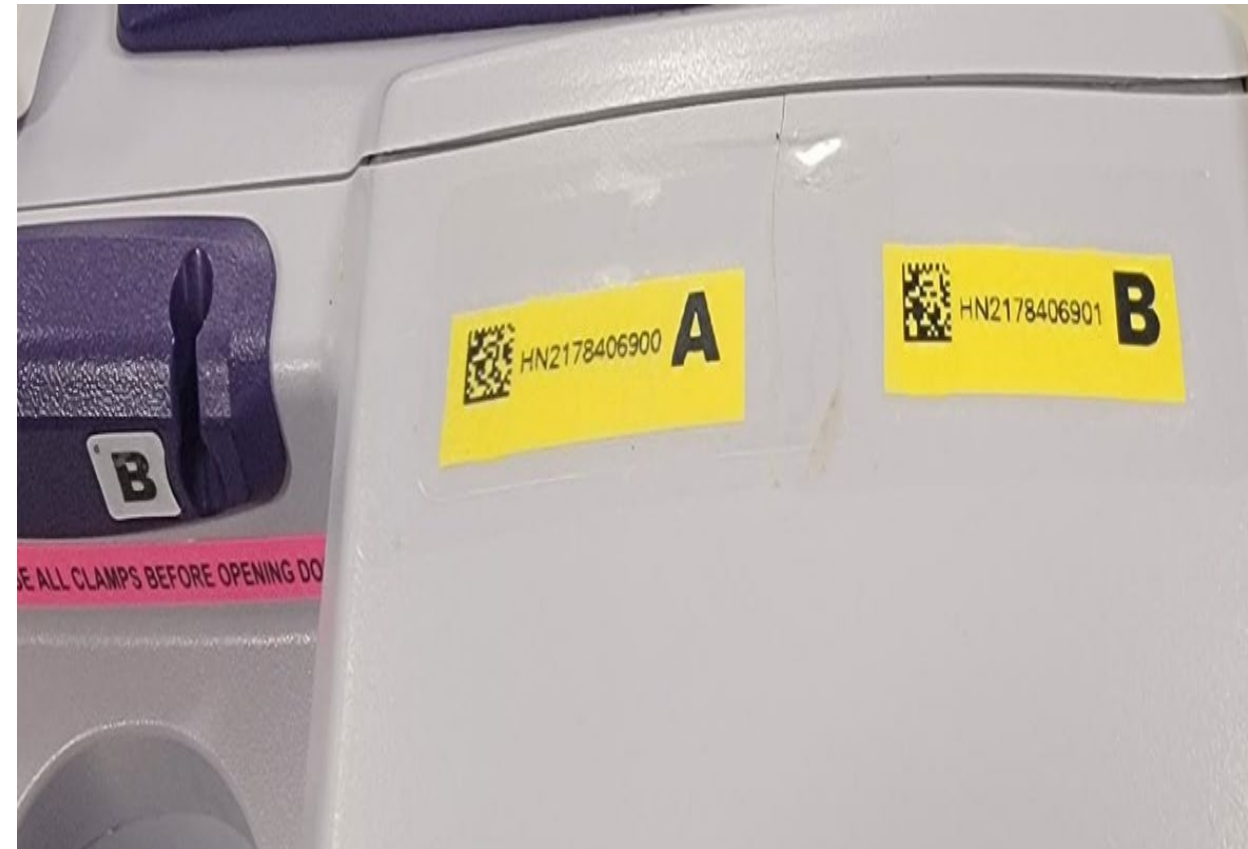
# What does this mean for Clinical Engineering

- Pump is an extension of the EHR
  - Pump integration – tier 1 – must be up and working
- Pump integration works on wireless network
  - Wireless coverage – must be everywhere a patient with a pump goes
  - Ensure you cover “locations” where pumps are stored
- Power
  - Battery replacement
  - Settings that “conserve” power may actually turn off wireless
  - Pumps may turn off wireless to conserve battery



# Device Management

- Infusion pump is built as a “device” in the EHR
- A barcode scan “links” the pump to the infusion order in EHR
  - All pump channels need a unique barcode applied
    - Need durable solution that holds up to cleaning
- Repair process – need to ensure that if you get a “new pump” or “new wireless board” device build in EHR gets updated



# Firmware Updates and Drug Library Pushes

- Roughly 15% of hospitals in US have some form of infusion integration live
- Still a lot of “learning”
- Still a lot we need to accomplish
  - Usually requires a change somewhere...
    - Pump firmware
    - EHR upgrade
    - Drug record build within EHR
    - Interface build within EHR
    - Pump Safety Software
    - Pump Safety Software internal engine
    - Drug Library Update

# Troubleshooting Partnership

- Need a relationship to someone who can get you the “integration” process
  - EHR compliance reports capture a lot of meaningful data
    - Did the clinician attempt to autoprogram
    - If so –how many times
    - Compliant or not
    - Any errors generated
  - Pump logs display everything that happens on the device

# Fleet Size - How can pump integration help?

- Goal - same level of infusion safety
  - Must have enough infusion devices to meet the standard
- Pump Integration
  - Identifies pump channels tied to infusion orders
- Pump Integration with RTLS
  - Easily identifies pump locations
    - Actively pumping
    - Linked to an order

# Pump Integration – Triple Win

- Safety, Efficiency and Transparency
- Clinical Engineering – Key Role
  - Keep the fleet healthy
  - Key stakeholder in device management
  - Key stakeholder in identifying opportunities
- Smart Pump Integration - still young technology
  - Future is exciting as we continue to push technology to improve infusion safety.

99.6%

Overall Accuracy  
44,013 of 44,174 attempts

# Questions & Discussions

Enter your  
questions  
to the Q&A  
window

# Thank You

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