2022-2023 Educational Webinar Series

IV Pumps Integration: Lessons Learned

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Speaker:
Tina M. Suess
Manager Medication Safety Integration

TinaMarie.Suess@pennmedicine.upenn.edu

Penn Medicine
Lancaster General Health
ACCE gratefully acknowledges the sponsorship of the 2022-2023 Educational Webinar series by
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.
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.
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

- Smart Pumps
- IV Integration BCMA/Pump
- IV Integration EHR / Pump Data Validate
- Bi-Directional IV Integration
- Bi-Directional PCA Integration
- Next Generation IV Pump – Plum 360
- Infusion Verify
- Autoprogramming most areas: Critical Care, Telemetry and Med Surg
- 15.11 MedNet 6.3.3
- Autoprogramming titrations

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

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

* 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

<table>
<thead>
<tr>
<th>Manual Process (17 steps)</th>
<th>Auto-programming (7 steps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Scan patient</td>
<td>• Select CCA</td>
</tr>
<tr>
<td>• Scan medication and complete required fields</td>
<td>• Scan patient</td>
</tr>
<tr>
<td>• Manually document in eMAR/BCMA</td>
<td>• Select CCA</td>
</tr>
<tr>
<td>Program pump:</td>
<td>• Scan Medication</td>
</tr>
<tr>
<td>• Select CCA</td>
<td>• Scan channel barcode</td>
</tr>
<tr>
<td>• Select line</td>
<td>• Send to pump</td>
</tr>
<tr>
<td>• Press drug list</td>
<td>• Press Start</td>
</tr>
<tr>
<td>• Scroll to find medication</td>
<td>• Select Yes to Confirm</td>
</tr>
<tr>
<td>• Press standard program</td>
<td></td>
</tr>
<tr>
<td>• Select dosing units</td>
<td></td>
</tr>
<tr>
<td>• Enter concentration (3 steps)</td>
<td></td>
</tr>
<tr>
<td>• Enter weight</td>
<td></td>
</tr>
<tr>
<td>• Enter dose</td>
<td></td>
</tr>
<tr>
<td>• Enter volume to be infused</td>
<td></td>
</tr>
<tr>
<td>• Press start</td>
<td></td>
</tr>
<tr>
<td>• Select ‘Yes’ to confirm</td>
<td></td>
</tr>
</tbody>
</table>
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

Provider Order Entry
Pharmacist verifies order

Order transmitted to MAR

5 Rights – Clinician scans bar code of patient and med

Clinician scans pump channel bar code

Five infusion parameters populate pump with automatic match to drug library
- Drug
- Concentration
- Dose/Rate
- VTBI
- Weight (if needed)

Clinician verifies populated settings and starts infusion

Pump settings compared to order

Infusion data available in EMR for clinician review and documentation
Side by Side Mismatch

• Checks how the pump is programmed compared to the MAR

![Image showing a side-by-side comparison of MAR and pump settings]
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.
Questions & Discussions

Enter your questions to the Q&A window

Thank You

Please complete the online evaluation form at https://www.surveymonkey.com/r/ACCE-2022-2023_session3 or scan the QR code