How IoT Can Improve Infusion Interoperability Clinical Workflow

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What is Interoperability?

- Definition in healthcare

“the ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged”.1


Basic Infusion Interoperability

- Order Pre-Population
- Infusion status data sent to EMR
- Pump configuration deployment
- Infusion data analytics

Before interoperability

- How many steps is the average for manually programming an infusion?
  - 5
  - 25
  - 17
  - 10

Poll!

Before interoperability

- How many steps is the average for manually programming an infusion?
  - 17


Disclaimer

This presentation reflects suggested topics of future interest to nursing practice. Any information presented should not necessarily be considered a reflection of BD future product development and may not represent the views of the company.
Before interoperability

- Problem

"A total of 426 medications were observed infusing through an IV pump. Of these, 285 (66.9%) had one or more errors associated with their administration. There were 389 documented errors overall, 37 were "rate deviation" errors and three of these were judged to be due to a programming mistake."

"Compared with other medication errors, infusion programming errors have a greater likelihood of causing injury."

Solving the problem

- Keystrokes - Opportunity for error

Bar code scans significantly reduce the number of key strokes.

Poll!

What is the reduction rate of keystrokes with interoperability?

- 86%
- 53%
- 68%
- 12%

Solving the problem

- What is the reduction rate of keystrokes with interoperability?

Answer

86%

Source: Implementation and Benefits of Interoperability Between the Electronic Medical Record (EMR) and Infusion Pump: ASHP 2015 Summer Meeting Poster, Jennifer Biltoft, PharmD, BCPS; Lonnye Finneman, PharmD, CSSBB; Joan Thullbery, RN, BSN; Jennifer Graves, RN, MHA; Katie Roedocker, RN, BSN. Accessed 21 June 2017.

Challenges of current state

- Based on barcodes - Old technology
- Is the data where it needs to be when it needs to be?
  - Limited data availability on pumps
  - Connectivity to systems holding that information
  - Patient association
  - Clinician login

How can IoT help?

- Connectivity
  - WiFi
  - Bluetooth Low Energy
  - RFID/NFC
How can IoT help?

- **Connectivity**
  - WiFi
  - Bluetooth Low Energy
  - RFID/NFC

How can IoT help?

- **Clinical Workflow**
  - RFID tags

How can IoT help?

- **Clinical Workflow**
  - John Doe
  - Order #1: Drug-aline 30mg/250mL 6 mg/Hr
  - Sarah McNurse
  - Confirm!

  - Automated detection
  - Patient
  - Medication order
  - Nurse
  - Order is retrieved and matched on the pump
  - Order and program is verified and confirmed by the nurse

How can IoT help?

- **Bluetooth**
  - Enables pumps to work as an ecosystem

How can IoT help?

- **Data Availability**
  - Peer-to-peer network between devices
  - Push data to devices immediately when available

How can IoT help?

- **Data Availability**
  - Cached data on devices
Need more graphics here to explain what I assume are multiple ways to run infusions? Not certain what this slide is about.

Kelly Larrabee, 6/26/2017
How can IoT help?

- Patient association
  - Patient proximity

How can IoT help?

- Nurse association

Conclusions

- IoT introduces many possibilities for strengthening infusion safety throughout the enterprise
- At the bedside, IoT can contribute to enhance the clinician’s confidence in ensuring that medications are administered as ordered
- The value of interoperability is extended by IoT enabling the use of data from infusions in conjunction with other sources of relevant information to drive improvements in clinical practice and operational efficiencies

Questions?

Thank you!

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