



# Quality and Efficiency with Infusion Pump Integration – Can you really have both?

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**HiMSS**

CENTRAL & SOUTHERN OHIO *Chapter*

# Premier Health Dayton, Ohio



Atrium Medical Center



Good Samaritan Hospital



Miami Valley Hospital



Upper Valley Medical Center

## Key Stats

- 1982 Licensed beds
- 3 Standalone EDs
- Private, non-profit hospitals
- 63,980 Inpatient Admissions
- 924,578 Outpatient Visits
- 299,640 ED Visits
- 12,260 Employees
- Level I and III Trauma Centers
- Level III Neonatal ICU
- 2248 pumps (PCUs) in the System

## Member Organizations

- Atrium Medical Center
- Fidelity Health Care
- Good Samaritan Hospital
- Good Samaritan North Health Center
- Koester Pavilion
- Miami Valley Hospital
- Miami Valley Hospital South
- Premier Community Health
- Premier Health Specialists
- Premier HealthNet
- Samaritan Behavioral Health, Inc.
- SpringMeade
- Upper Valley Medical Center

# Objectives

Participants will be able to:

- Identify 3 or more goals of infusion pump integration
- Discuss safety features provided by integration
- Compare workflows pre- to post-implementation
- Quantify the workload involved in operationalizing interoperability
- Apply lessons learned from this organization

# Alaris® Smart Pump



# Premier's Goals of Implementing Integration

## ➤ Patient Safety- always first

- **Decrease number of medication errors**
  - Increase in Guardrails® Utilization/Compliance
  - Decrease in overrides – including “High risk Overrides”
  - Limits on administration rate, dose, concentration providing real-time feed back to the user
  - The pump is auto-programmed by the order in the EMR (EPIC) with the RN validating the information
- **Improved EMR (EPIC) documentation**
  - Volume in Intake and Output
  - Every rate change
- **Increase in usage and reliability of Patient ID entry**

# Premier's Goals cont....

## ➤ Increase Nursing Efficiency

- **Decrease manual entry steps**
  - Pump- Patient ID, dose, rate, volume
  - EMR- rate changes, intake

# Alaris® Smart Pump





# Alaris® Interoperability

## Alaris IV Orders & EMR BCMA Management Workflow



1. Scan the patient's wristband



2. Scan the medication



3. Scan the pump

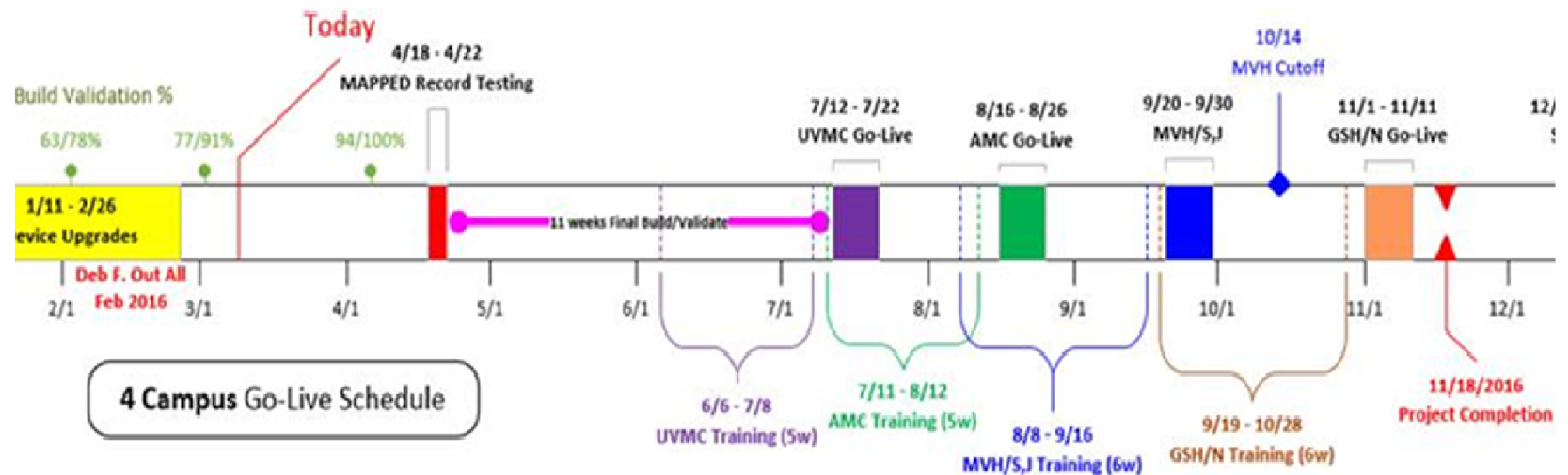


4. Review & Confirm



5. Sign (on computer or handheld)

# Implementation Timeline



# Challenges in Implementation

## ➤ Standardization-

### — Alaris Library

- 4 libraries to 1
- over 30 profiles across the system to 5 (Adult, Neonatal, NICU, ECMO, Pediatric, Respiratory)

### — Medication Build

- Individualized medication builds (ERx's) for each hospital
  - Example- 80 vancomycin records available in the database. 30 of those were being used in productions on preference lists and order sets. We were able to cut this down to 4 standardized Erx's available in order entry
- Standardize build of high risk medications
  - Chemotherapy agents
  - Hazardous medications
  - Medications requiring titration

# Challenges in Implementation cont....

- **Ordersets**
  - Replace old ERx with new
  - Include order for primary infusion for secondary infusions
  
- **Pumps and Supplies**
  - Locating all pumps for updating and application of bar code
  - Identifying what type of pumps were in what location
  - Determine different tubing types at each location
  
- **Nursing Workflows**
  - IV push (syringe pump used for ease of administration)
  - Intermittent infusions (primary or secondary)
  - Fluid bolus- gravity or pump; from current bag or new bag
  - One order but split in two bags
  - NICU- prime line with medication (syringe module detects less volume to be infused and will adjust infusion rate- from 2 ml/30 minutes to 1ml/30 minutes)

# Challenges in Implementation cont....

- **Use of Bar-coding Med Administration**
  - Ambulatory Infusion Centers
    - Not all locations bar-coding
    - No armband printers
  - Same-day Surgery Admission/Discharge

## ➤ Mapped Record Testing (MRT)

### — Prep Time

- Test system with patients and orders
- Test pumps loaded in test system
- Scanners
- Packet with patient ID, ERx order to test, log sheet for pass/fail/error messages

### — Staff

- Nurses
- Willow team members (pharmacy builders)
- Pharmacists

# Challenges in Implementation cont....

## ➤ Training

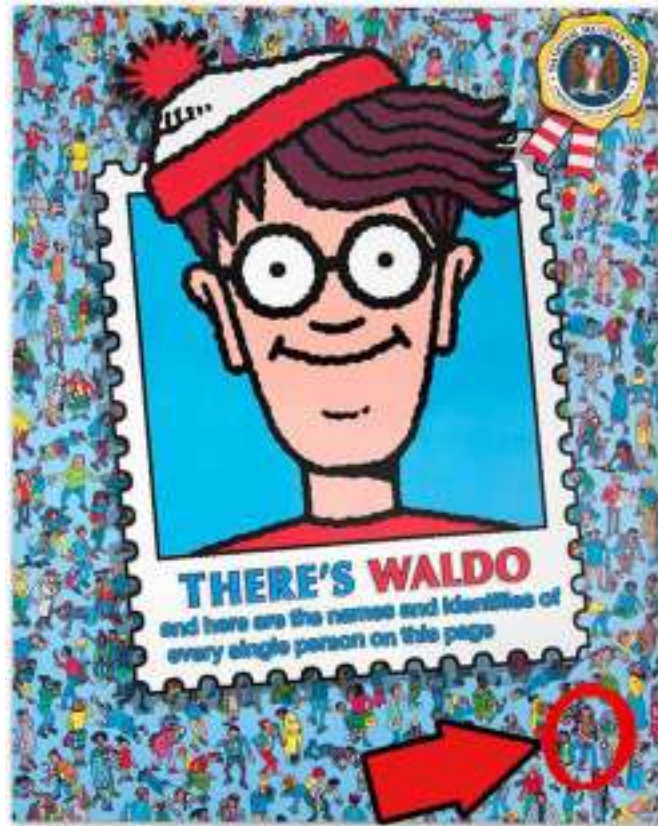
### — Nursing

- Super Users- 4 hours
- End Users- 2 hours
- Pharmacists

### — Resources

- Test system with patients and orders
- Test pumps
- Scanners
- Patient IDs
- \$\$\$\$
- Time and location
- Educational Materials- scenarios, tip sheets, quick guides

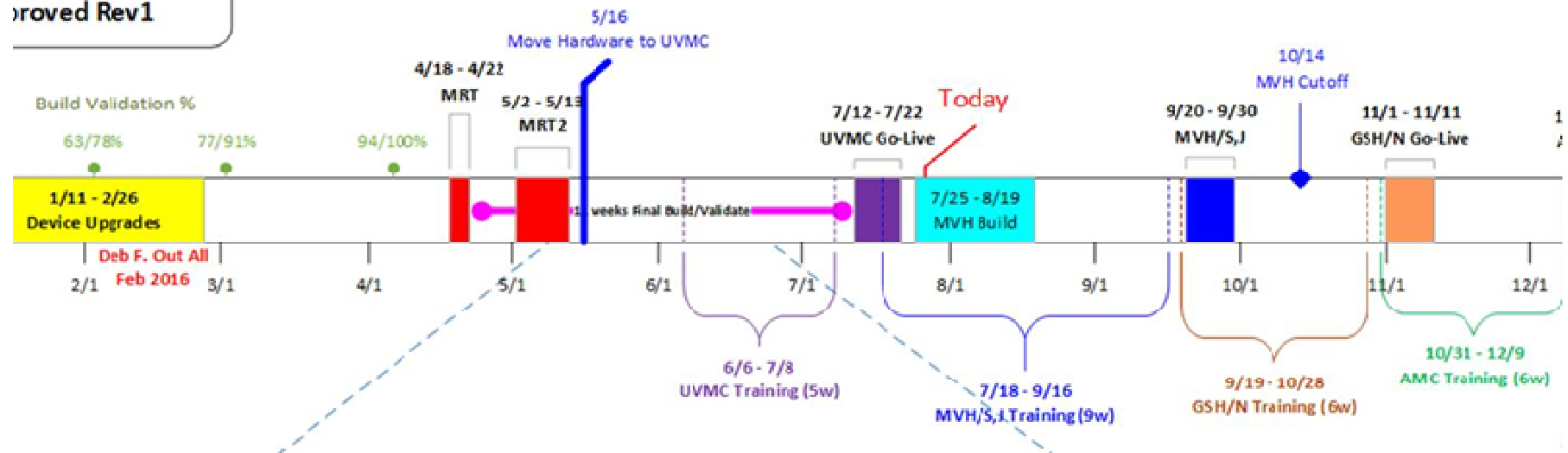
## Challenges in Implementation cont....



- Locating pumps
- Personnel changes
- Wireless communication
- Communication

# Revised Implementation Timeline

Revised Schedule  
Approved Rev1





# Go-Live

- Command Center
  - Originally scheduled for 2 weeks
  - Currently scheduling 3 days
- Compliance Reports
- Rounding Teams
- Snacks!

# Maintenance

➤ New medications

➤ Guardrail optimization

➤ Removal of unused medications

➤ Frequency of updates

- The library communicates wirelessly to each pump if it is turned on, but each pump must manually be uploaded to the new library
- Identification of each pump that has been updated (currently using colored tags to identify that a new library has been loaded)

# Lessons Learned

- Allow sufficient time for complicated workflow areas
  - ED
  - NICU
- Resources...and ongoing resources
  - This project is more than a technology project
  - Bolus, flush, special populations, transfers, emergencies, back association
  - Standardization of orders with nursing workflows
  - Nursing orientation and sustaining/improving compliance
- Collaboration
  - IT
  - Nursing
  - Pharmacy
  - Clinical Engineering
  - Interface
  - Orders, Willow, Clin-doc teams

# More Lessons Learned

➤ TEST - TEST - TEST - TEST - TEST - TEST - TEST  
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## ➤ Common Interface Errors

- Medication is not listed in the drug library
- Attempting to infuse a secondary medication without a primary
- The selected infusion pump channel is currently infusing

## ➤ Personnel

- Transfers and float staff (correct security)
- Agency and Contract staff

## ➤ Additional Benefits

- Inter-hospital transfers safer and more expedient-
  - med concentrations/dosing would require orders and pump change out
- Pharmacy efficiency and cost reduction
  - Time to update libraries (single med could be in multiple libraries at each hospital)
  - Standardize doses able to eliminate stock

# Nursing Perceptions

- Longer to administer medications
- Delay in wireless communication
- Inefficient- rooms are not arranged efficiently (pumps on one side of the bed and the computer on the other side)
- Changing to more positive as comfort level increases



# Thank You

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