ACHIEVING 'JUST-IN-TIME' PAR LEVEL ASSET MANAGEMENT WITH RTLS

Christian Buchsteiner, Healthcare Improvement Engineer
Sacred Heart Medical Center at RiverBend

DISCLAIMER: The views and opinions expressed in this presentation are those of the author and do not necessarily represent official policy or position of HIMSS.
CONFLICT OF INTEREST DISCLOSURE
KASPAR “CHRIS” BUCHSTEINER

Has no real or apparent conflicts of interest to report.
<table>
<thead>
<tr>
<th>Learning Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> Study the process of fully and accurately documenting equipment flow</td>
</tr>
<tr>
<td><strong>2.</strong> Compare distribution models and discover how to effectively design a “Just-In-Time” distribution model that ensures equipment is <em>always</em> available when needed, where needed</td>
</tr>
<tr>
<td><strong>3.</strong> Identify how to accomplish buy-in from clinical staff and implement new distribution policies without interrupting patient care</td>
</tr>
<tr>
<td><strong>4.</strong> Recognize how to maximize equipment utilization and provide transparent, enterprise-wide awareness of equipment availability</td>
</tr>
<tr>
<td><strong>5.</strong> Share knowledge regarding the tools and principles of PAR level asset management required to attain ROI</td>
</tr>
</tbody>
</table>
INTRODUCTION

Christian Buchsteiner is a Healthcare Improvement Engineer at PeaceHealth Oregon West Network in Springfield, Oregon.

► Certified Lean Healthcare Black Belt
► Bachelor’s degree in Mechanical Engineering
► Wide range of experiences across different industries, including manufacturing, laboratory and hospital operations
► A passion for improvement, supported by operational know-how and the ability for effective, practical application of technology
IMPROVING INFUSION PUMP USAGE AND UTILIZATION

RTLS Technology in Healthcare

“Knowing the location (assets)…and then what?”
Healthcare systems utilize hundreds of expensive assets every day. Management of these assets is an ongoing challenge.

- Absence of standard process
- Lack of technology integration
- Lack of accountability
- Lack of data (location, demand, utilization, cost, stewardship)

By eliminating waste in inventory, utilization, storage, hoarding and hunting, the savings potential is in the millions.

Fixing these problems has been a daunting task. Justifying new or additional equipment during the capital budgeting process is a challenge…but often the only solution.
Sacred Heart Medical Center at RiverBend

SHMC at RiverBend

Design Vision:

► Healing environment for patients, visitors and staff
► Patient- and family-centered
► Flexible, expandable and adaptable
► State-of-the-art design and use of technology

Details:

► 1.2 million square feet (23 football fields)
► 356 licensed private beds and 47 ER beds
► 28 OR suites (4 Cardiac Surgical Suites)
► Complete Women’s Services line
Accuracy is Foundation

Room-level locating and tracking

SHMC RiverBend – RTLS Technology

► Opened with IR-RFID RTLS Sensory Network in place
  ▪ Provides data using infrared (IR) and radio-frequency (RF) technology

► Entire hospital and selected ancillary buildings are wired
  ▪ 2,100+ sensors
  ▪ 2,700 badges
  ▪ 1,500 (and growing!) asset tags

► Integrated to Nurse Call
SHMC RiverBend – RTLS Journey

2008
- ED and Anesthesia Clinic Patient/Staff/MD/Equipment
- OR equipment tracking
- Staff tracking in Nurse Call

2009
- OR nursing staff tracking

2010
- Interpretive Service Equipment
- Distribution Asset Module (for IV Pumps)

2011-12
- L&D and M&B Patient/Staff/MD/Equip.
- Expanding Asset Module for other assets
- Utilization of location information for CQI
Asset Management Design Foundation

“The starting point for improvement is to recognize the need.” (IMAI)

- Executive leadership
- Process ownership
- Frontline-user design involvement
- PeaceHealth internal IT resources and expertise
- Strong relationship with RTLS vendor

Design Approach – focus on cultural transition
DISTRIBUTION MODEL OPTIONS

Centralized

Hybrid

Decentralized
STEP 1 – ASSET UTILIZATION

Evaluate asset (IV pump) utilization and determine # required.

- Benchmarks and calls to other hospitals
- Internal (very cumbersome) observations

New!!!

Streamlined data collection by using RTLS to determine usage and utilization
(Tag and track a sample number of assets)
STEP 2 – GOAL SETTING

- Reduce the number of infusion pumps by 26% from 923 to 700 channels
- Improve patient care and safety
- Increase availability of assets
- Eliminate “hoarding” and the need for “hunting”
- Eliminate frustrations
- Eliminate the need for rental/lease
- Establish a standard process
**STEP 3 – DESIGN BASICS**

- Establish process operational ownership
- Frontline user involvement – design champions
- Brainstorm distribution process options
  - Centralized vs. Decentralized vs. **Hybrid** Model
- Location information + operational meaning/purpose
- RTLS technology is process “backbone”
- RTLS room-level accuracy is vital
- Process Management required for sustainability and continuous improvement
What’s wrong with the current state process?

- Distribution process = “Provide what is available”
- Prone to pump “hoarding” and “hunting”
- Produces daily caregiver frustration
- Impacts patient safety and delays patient care
- Adding more IV (rental) pumps (assets) and increasing inventory is not solving the root causes of the problem
- Expenses are no longer sustainable
**STEP 4 – FUTURE STATE**

1. Identify one central storage location on each unit
2. Establish PAR levels – number of pumps required
3. Ensure RTLS infrastructure is in place and accurate
4. Establish critical inventory alerts (High and Low)

**“RTLS information with operational meaning and purpose!”**

RTLS supports decentralized PAR management process, based on a JIT delivery concept.
No Extra Steps for Nurses!

- Process is seamless
  - Required process training
- Nurses do not have to access another system
- Pumps are always available
  - Need for hunting and hoarding is eliminated
- Uninterrupted infusion care
THE KEY “BARRIER”

Taking pumps away?  
You must be crazy!  
We never have enough!

You are doing what!?  

► Engage frontline users in data collection  
  ▪ Foster understanding of usage and stewardship  
  ▪ Enlist design champions
THE NEW “PROCESS”

Distribution

Distribution balances pump inventory by responding to RTLS application generated inventory alerts → **JIT delivery model**

Clinical Staff

Clinical staff (RNs/CNAs) facilitate cleaning and removal of unused pumps. Return to units’ central location

ENVS

ENVS to clean and remove unused pumps at discharge. Return to units’ central location
THE "APPLICATION" – PHASE I

Riverbend Sigma Pump Count by Location

<table>
<thead>
<tr>
<th>Location</th>
<th>Pump Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 NICU totals:</td>
<td>0</td>
</tr>
<tr>
<td>5N L/D totals:</td>
<td>10</td>
</tr>
<tr>
<td>5S M/B totals:</td>
<td>7</td>
</tr>
<tr>
<td>6N Ortho totals:</td>
<td>3</td>
</tr>
<tr>
<td>6S Neuro totals:</td>
<td>2</td>
</tr>
<tr>
<td>7N Surg totals:</td>
<td>7</td>
</tr>
<tr>
<td>7S Surg totals:</td>
<td>6</td>
</tr>
</tbody>
</table>

This report provides a total of each badged and sensed Sigma Pump in the defined Riverbend locations for the following time: 2010-07-21 17:00:00

Actual assessed between 1700 – 1815
THE “APPLICATION” – PHASE II

Phase 2 – April 2011 (final solution and standard)

PAR Level Management Module

► PAR levels and inventory alerts are set by distribution
  ▪ RTLS PAR management interfaces with mail exchange server

► RTLS aggregates number of pumps in central storage location

► Automated alert notifications for **threshold** violations
  ▪ Email to designated addresses on an hourly basis until violation is resolved
  ▪ Sends a pop-up message to designated workstation/dashboard on an hourly basis until violation is resolved
  ▪ Email triggers a text message to pager/phone
  ▪ Violations are automatically resolved, once minimum PAR level is in place
What We See & Hear
RTLS Accuracy

➤ The new process and application is dependent on reliable and accurate room-level tracking.
➤ The systems overall capability and exceptional performance is essential.
→ Accuracy exceeded expectations by far!

Supporting data:
A two-year post implementation inventory accounted for 99.7% of pumps (698/700).
RESULTS

► Total number of IV channels was reduced
  ▪ By 26% - from 923 to 700
  ▪ Utilization increased from 43% to 75%
► Frustration (“noise”) is gone
► The need for calls to request pumps is eliminated
► The need for hoarding and hunting is eliminated
► A system of “Economy of Plenty” for caregivers
► Ability to track pumps with RTLS
  ▪ Know location and utilization
  ▪ Can obtain data to streamline inventory values
COST SAVINGS AND ROI

Par-Level IV Pump Management

► Eliminated need for rental/lease equipment and expense

► Eliminated IV Channels by 26%, resulting in:
  ▪ Immediate cost avoidance of about $600,000
  ▪ 10-year cost saving of $2.7 million
**COST SAVINGS AND ROI**

Utilizing the same approach for other assets allowed for an additional 30% to 50% reduction of assets.

### Other savings since IV pump go-live:

<table>
<thead>
<tr>
<th></th>
<th>Cost Avoidance</th>
<th>10-Year Saving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syringe pump replacement</td>
<td>$45,000</td>
<td>TBD</td>
</tr>
<tr>
<td>Feeding pump replacement</td>
<td>$38,000</td>
<td>TBD</td>
</tr>
<tr>
<td>PCA pump replacement</td>
<td>$184,000</td>
<td>TBD</td>
</tr>
<tr>
<td>SCDs reduction</td>
<td>WIP</td>
<td>TBD</td>
</tr>
</tbody>
</table>
Continuing to Improve

- Removal of unused and inactive pumps from patient rooms by caregivers

“A system must be managed. It will not manage itself. A system must have an aim and the purpose or aim must be clear to everyone in the system.” (E. Deming)
Asset Management – Reports Examples

Process Control → sustainability and improvement

Inventory alerts ....

![Graph showing alerts trend by location](image-url)
Acknowledgement – “Team”
RTLS is an operational foundation and a necessity for any enterprise.

**Final Take-Away**

**BASIC**
- “Know” locations

**ADVANCED**
- “Use” location information

**SUPERIOR**
- “Translate” location information

The possibilities are endless……
Superior RTLS

Technology (Framework)

Solution (Application)

Reports/Data (Analytics)
Thank You for the Opportunity

Christian Buchsteiner
Healthcare Improvement Engineer
Sacred Heart Medical Center at RiverBend
cbuchsteiner@peacehealth.org