Bar Coding Implementation: Hospitals

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• JFK is a 454-acute care bed major medical center specializing in cardiac care, orthopedics, oncology, and adult (geriatric) medicine; 52 ICU beds
• Average daily census=380
• Average 25,000 admissions and 60,000 ER visits annually
• Perform up to 600 open-heart surgeries and 7000 cardiac catheterization procedures annually
Bedside Scanning Goals

- HCA corporate initiative
- Avoid potential system errors
- Prevent Medication Errors
- Assure 5 rights of Medication Administration
- Improve documentation/accountability
- Charge capture
- Eliminate omissions
Multidisciplinary Committee

- **Steering Committee**
  - Leadership: nursing, pharmacy, respiratory, IS, risk management, education, medical records, quality
  - Monthly (or less)
  - Support

- **Core Team**
  - eMAR worker bees
  - Project implementation and maintenance
  - Nursing, pharmacy, respiratory, IS, education
Pre-implementation Considerations

- Software integration
- Bar Coding solutions
- Nursing/RT equipment
- wLAN
- Dictionary edits (nursing/pharmacy)
- Develop workplans and timelines
Interfaces and Integration Issues

- Decisions must be based on compatibility with current systems or be willing to convert
Equipment Selection

• Bar Coding Equipment
• End user equipment
  – Equipment Fair (rating surveys)
  – Involve staff nurses and RTs
  – Evaluate for durability, ergonomics, replacing current equipment?, measurements, storage/re-charging
Bar Coding Equipment

- Facility delivery system (profile dispense, 24 hr cart fill, nurse servers)
  - Cart fill (automation examples)
  - Unit based cabinets
  - Manual bar coding
    - Projected Volume
    - Real estate in the pharmacy department
    - Lease verses purchase
Robot-Rx Cart Fill

- 24 cart fill and first doses
- Size implications
- Automated returns
- Cassette or envelop delivery system
Pharmacy Operations

- Facility has been using AcuDose™ Profile Dispense since 1999 as a result of inefficiency of cart fill system
- Staffing Shortages
- Medication Security Issues
- Patient Safety
- Dispense 9000 doses/day (280,000 doses per month)
AcuDose-Rx Dispensing Machine

- Unit based
- High capacity drawers, matrix drawers, steel locked lidded drawers
- Profile Dispense verses Inventory
AcuDose-Rx

- High capacity drawers
Vendor Selection Process

• Reviewed contracted vendors product offerings
  – Integration with current systems
  – Cost analysis
  – Workload analysis
  – Physical attributes and space requirements
  – Software issues/compatibility with interfaces
  – Customer service/timeliness
<table>
<thead>
<tr>
<th>Bar-Coding Solutions Evaluated</th>
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</thead>
<tbody>
<tr>
<td>• PakPlus-Rx- McKesson packaging solution where staff and equipment are provided to bar code medications</td>
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<tr>
<td>• Robot-Rx</td>
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<tr>
<td>• Current System of manual repackaging- Southwest medical equipment</td>
</tr>
<tr>
<td>• Highspeed packaging system (HIS vs PacMed)</td>
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</tbody>
</table>
Additional Considerations

- Needed most efficient way to bar code medications and refill AcuDose-Rx unit based cabinets
- Lease verses purchase
- FTEs needed to run equipment
- Packaging material expense
PacMed

- Automated bulk packager
- Various sizes (canister storage)
- Interfaced with unit based cabinets
- Tadpole labeler
PacMed
PacMed Benefits

- Bar-coding system is closed-loop so virtually error-proof
- Fill time with high-speed packager decreased significantly
- Cabinet par levels are exact (prevents overfilling)
- Below Par list assists with ordering bulk medications
- Cost savings using bulk verses unit dose
Bulk Packager

- Manual feed
- Smaller package size
- Storage of packaged medications
Eltron Printer

- Bar code labeler
Overwrapper

- Plastic bag overwrapper for injectables, suppositories, etc
JFK’s Complete Bar-Coding System

- PacMed for top 270 oral solids (used >30 doses/month)
- Tadpole labeler for multi-use items
- Avery labels for single-use injectables, IV’s, topical patches, etc
- Continue to use Southwest medical packager for slow user items
- Datamax thermal printers for IV labels
Quality Assurance

- Must design safety and log system for checking and documenting unit dose was bar coded correctly. Documentation is influenced by state regulations.
- Scan bar code into pharmacy information system and confirm bar code attached correctly
Bar code verification of canister fill

- Scan bulk bottle and canister before refilling
PacMed canister refill

• Weight confirmation
End User Equipment Decisions

- Include staff from nursing and pharmacy as well as IS, Biomed, and engineering
- Evaluate drug delivery system
- Equipment demonstrations - size, portability, battery life, storage (re-charging), durability; Use a survey tool for evaluating equipment
- Deploy equipment to end users 30 days before implementation
Rubbermaid Cart

- Laptop
- Metrologic scanner
- Drawer space
- Ergonomic design
  - Height adjustment
  - Lightweight
Stinger

- Outpatient choice
- Not optimal storage bins
- Easy roll
Ergotron
Wireless Network

• If wireless not installed, will need survey to evaluate needs
• Must install in all areas where eMAR is planned
• IS department should be responsible for this piece
• Signal strength issues
Dictionary Edits

• Pharmacy:
  – Drug description edits (admin form, routes, etc)
  – Attach bar codes
  – Design and attach customer defined screens
  – MAR formats
  – Reports
  – Nurse view access
Dictionary Edits

• Nursing
  – Access changes
  – Electronic signature feature for co-signatures
Work Plans and Timelines

• Central database for implementation (core team)
Policies and Procedures

- Downtime procedures
  - MAR back-up system
- Equipment Cleaning
- Medication Administration (and record)
- Pharmacy QA
- Trouble-shooting
Training

• End Users
  – Nursing
  – Respiratory Therapy
  – Manual
  – Classroom and hands-on
  – Timeframe for training
  – Super User/ roll-out plan

• Pharmacy
  – Order entry changes
  – Verification of emergency administrations from nursing and respiratory
  – Outstanding request reports
  – Trouble-shooting with end users
Monitoring Efficacy

- Increase in med error reports (near misses)
- System reporting
- Scanning Rates
- Re-education
- Rewarding
Go Live

• Pilot unit
  – Cohesive, small, general medicine floor (least amount of transfers to other floors)
  – Conduct parallel 2 weeks prior to Go Live
  – 24 hour Super user staffing
  – Spend 2 weeks on pilot floor
  – Monitor reports
# Successful Statistics

<table>
<thead>
<tr>
<th>eMAR SCAN RATES -- 2006 -- 2nd Quarter</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Doses Administered</strong></td>
<td>628,359</td>
<td></td>
</tr>
<tr>
<td>Non-warned doses not administered (sliding scale, off floor, NPO, etc.)</td>
<td>113,410</td>
<td></td>
</tr>
<tr>
<td><strong>Total Doses Scanned (Corporate requirement -- 95%)</strong></td>
<td>616,198</td>
<td>97.40%</td>
</tr>
<tr>
<td>Warnings on Scanned Doses</td>
<td>295,441</td>
<td>47.9%</td>
</tr>
<tr>
<td>Warned Doses Not Administered</td>
<td>120,904</td>
<td>40.9%</td>
</tr>
<tr>
<td><strong>Reasons for non-administration on scanned warnings:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lab results abnormal</td>
<td>27,666</td>
<td>22.9%</td>
</tr>
<tr>
<td>Lab results normal</td>
<td>16,959</td>
<td>14.0%</td>
</tr>
<tr>
<td>Administration date/time variance</td>
<td>50,922</td>
<td>42.1%</td>
</tr>
<tr>
<td>Wrong dose (too much or too little)</td>
<td>9,210</td>
<td>7.6%</td>
</tr>
<tr>
<td>Wrong patient</td>
<td>4,463</td>
<td>3.7%</td>
</tr>
<tr>
<td>Other</td>
<td>15,255</td>
<td>12.6%</td>
</tr>
<tr>
<td><strong>Total Arm Bands Scanned</strong></td>
<td>292,453</td>
<td>97.70%</td>
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</tbody>
</table>
• Involve nursing from the beginning
• Include a full-time nurse in eMAR planning, training, implementation, and follow-up
• Recognize and educate that bar-coding and bedside scanning is NOT designed to save time or money--- but is a Patient Safety Initiative
• Premium credits (malpractice insurance)
• Medication error reduction
Bar Coding: Flourish or Fail?

- Premium credits
- Equipment Expense
- Software integration
- Education/Training
- Unit dose packaging direct from manufacturer
- Medications are onetime use
Bar Coding Documentation

- **Assessing Bedside Bar-Coding Readiness** (AHA, HRET, ISMP). [www.ismp.org/PDF/PathwaySection3.pdf](http://www.ismp.org/PDF/PathwaySection3.pdf)
Bar Coding Documentation

• Implementing a Bar Coded Medication Safety Program: Pharmacist’s Toolkit (ASHP).
  www.ashpfoundation.org/BarCoded.pdf

• www.IHI.org/IHI/Topics/PatientSafety/MedicationSystems (IHI)
# Industry Resources

- **ASHP**: [www.ashp.org](http://www.ashp.org)
- **HIMSS**: [www.himss.org](http://www.himss.org)
- **Pathways to Medication Safety**: [www.medpathways.com](http://www.medpathways.com) (Readiness Assessment)
- **ISMP**: [www.ismp.org](http://www.ismp.org)
- **GS1 US**: [www.uc-council.org](http://www.uc-council.org) (Auto-ID standards)
- **HIBCC**: [www.hibcc.org](http://www.hibcc.org) (Auto-ID standards)
- **ISBT**: [www.isbt.org](http://www.isbt.org) (Blood transfusion)
- **AABB**: [www.aabb.org](http://www.aabb.org) (Blood bank)
- **AHA**: [www.aha.org](http://www.aha.org) (Beyond Blame video)
- **Terra Pharma Project**: [www.unsummit.com](http://www.unsummit.com)
- **Hospitalbarcoding.com**
QUESTIONS?