Achieving safety in medication management through barcoding technology

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Sharp Healthcare
SESSION OBJECTIVES

✓ Describe the primary activities contributing to the success of implementing medication management technologies with a focus on safety

✓ Explore processes and metrics used when establishing and extending medication management and safety, highlighting efforts to utilize barcode technology for a high reliability approach towards patient safety

✓ Discuss the relevance and significance of designing and monitoring key medication management reports and analytics to promote positive patient outcomes and optimized safety measures
SHARP HEALTHCARE OVERVIEW

- Not-for-profit integrated healthcare delivery system serving 3.2 million residents of San Diego County
  - 7 Hospitals, 2 Medical Groups, Health Plan
  - Integrated information technology systems
  - Centralized system support services
  - Largest health care system in San Diego with highest market share

- Largest private employer in San Diego
  - 18,000 employees
  - 2,600 affiliated physicians
  - 3,000 volunteers
SHARP HEALTHCARE MISSION

To improve the health of those we serve with a commitment to excellence in all that we do. Our goal is to offer quality care and services that set community standards, exceed patients' expectations and are provided in a caring, convenient, cost-effective and accessible manner.
SHARP 2018-2022 STRATEGIC GOALS

Sustain strong financial performance
- Attain continued market share growth
- Elevate status as high quality, low-cost provider
- Maximize value-based purchasing
- Enhance financial position and capital structure
- Drive further efficiencies and standardization
- Transition INSPIRE (philanthropic campaign) to Ocean View Tower and other priorities

Achieve top decile results
- Advance quality, safety, service, employee and physician measures
- Become a High Reliability Organization
- Leverage IT systems to support quality and safety initiatives
- Operate as an optimal consumer-centric system

Leverage integrated delivery system structure
- Advance population health (analytics, predictive modeling)
- Innovate care delivery and technologies (consumer facing)
- Support and improve physician alignment
- Further innovate and grow Sharp Health Plan
- Maintain and enhance payor relationships

Advance capacity, throughput, and innovation
- Expand capacity in the South Bay, East County and Metro Central regions
- Expand ambulatory footprint throughout San Diego County
- Maximize North County presence
- Improve through LEAN/Six Sigma
- Enhance retail and virtual offerings
<table>
<thead>
<tr>
<th>VALUE</th>
<th>RISK &amp; INNOVATION</th>
<th>STRATEGIC ALIGNMENT</th>
<th>RESOURCE MGMT</th>
<th>DECISION MAKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS acquisition will occur to add value, we will measure our success on the basis of business outcomes</td>
<td>IS will take measured and manageable risk to enable innovation</td>
<td>IS efforts will be aligned with the strategic initiatives of the health care system</td>
<td>IS will ensure efficient and prudent management of resources (people, software, hardware, data...)</td>
<td>IS will collaborate and partner on decisions</td>
</tr>
<tr>
<td>We will leverage our core vendors first to gain additional value before seeking new partnerships</td>
<td>We take measurable risk as needed to support the business</td>
<td>Planning efforts are aligned with Sharp Healthcare’s strategic initiatives</td>
<td>We will invest in our workforce to retain &amp; attract the highest talent while efficiently managing their capacity to deliver results</td>
<td>Key stakeholders are involved and jointly accountable for results</td>
</tr>
<tr>
<td>We stay current with industry trends and experience from others to leverage existing investments in order to gain as much value as possible</td>
<td>We will make informed choices, selecting the most appropriate action that balances benefits and risks with a focus on reducing significant risks</td>
<td>Prioritization of initiatives is an ongoing process to manage demands on resources and utilizes our pillars to guide in scoring</td>
<td>We will manage our infrastructure and hardware assets to perform at the highest reliability</td>
<td>Standardization is embraced as best practice to ensure efficiencies of hardware, software and workflow</td>
</tr>
<tr>
<td>Enterprise process improvement tools will be utilized in conjunction with technology to gain greatest value</td>
<td>We look for innovative solutions to further our organizational success by thinking beyond what is accepted or deemed possible</td>
<td>We will manage our software following best practice application management principles to function at the highest level</td>
<td>Governance structure of committees will guide IS decision making on new requests, prioritization, and the ongoing management of projects</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>We will treat data as an organizational asset and manage it as such</td>
<td></td>
</tr>
</tbody>
</table>
SUPPORTING OUR HIGH RELIABILITY STRATEGY FOR MEDICATION ADMINISTRATION
HIGH RELIABILITY OVERVIEW

Risk Ownership

Where are the risks in organizational processes, activities, and capabilities

Proactive Identification

Address risks early and objectively

Empowerment

All colleagues own and escalate risks equally in culture of responsibility

Resilience

Address risks and continue in efforts to improve

MEDICATION MANAGEMENT SAFETY OVERVIEW

- Right patient
- Right medication
- Right dose
- Right time
- Right route
- Right documentation

More than half of patients admitted to the hospital will experience a medication error.

Wrong medication, wrong patient, drug/drug interactions, allergies, and wrong time.

Clinical practice and engagement can be a factor.

CLOSED LOOP MEDICATION MANAGEMENT WITHIN THE HEALTHCARE SYSTEM

- 23-56 percent Reduction in number of reported adverse events
- 45-77% reduction in observed adverse events
- 10 percent reduction in total time nurses spend documenting medication administration
- Reduction in number of steps in medication administration

IS MEDICATION MANAGEMENT STRATEGY FOR FUTURE GROWTH AND EVOLUTION

ROBUST DATA ALLOWING FOR SUPPORT OF ORGANIZATIONAL GOALS AND CONTINUOUS QUALITY IMPROVEMENT

- Cerner Rules & Alerts
- Real Time Med Mgmt Dashboard
- NICU MAR & M-Pages
- Cerner ePrescribing
- Cerner Infusion Suite

Optimize current applications

New Projects/Solutions

BCMA

CPOE

CERNER EMR Integration with SYSTEM PHARMACY
Potential Risks

Intake
- Various manual processes
- Overall data accuracy

Order Management
- Varying levels of CDS rules
- Paper TPN orders
- Multiple locations for infusion data in chart
- No policy for med order management
- Paper based oncology orders

Verification
- Unknown percentage of meds given without Pharmacist medication verification
- Manual processes

Storage/Dispense
- Non-profile Pyxis stations
- Pyxis profile overrides
- Kits and floor stock
- Manual processes
- Many non-integrated applications throughout pharmacy operations

Administration
- Compliance for med dosing
- Manual processes to assess infusion status
- Med Barcoding not fully implemented
- Pyxis profile overrides

Transfer
- No visibility to OR administrations
- Med reconciliation not consistently completed

Planning for Discharge
- No visibility to Pharmacist coverage
- Manual process for electronic reporting
- No defined discharge process for med management

Discharge
- No visibility of Discharge med reconciliation for new
- Reason for Medication D/C not required
- No ability for cross-encounter med rec

Known risks without current solutions
BUILDING OUR CAPABILITIES
MEDICATION MANAGEMENT-
BARCODE TECHNOLOGY
BARCODE TECHNOLOGY AT THE BEDSIDE- BCMA

Barcode Investments

Cost of care for Adverse Medication Error
$3100-7000 per instance

Cost to implement/manage BCMA
$2000 per instance avoided

Leapfrog Hospital Survey Factsheet: Barcode Medication Administration

• Advance Quality, safety, service, employee and physician measures
• Become a High Reliability Organization
• Leverage IT Systems to support quality and safety initiatives
• Operate as an optimal consumer centric system

- Right patient
- Right medication
- Right dose
- Right time
- Right route
- Right documentation
What outcomes have been observed at Sharp Healthcare towards reducing or eliminating preventable medication events that reach the patient?
OUR SUCCESS WITH BARCODING TECHNOLOGY

✓ Bar Code scanning compliance report
✓ System threshold for scanning compliance at 95%
✓ Appropriate follow through and accountability established
Preventable Medication Administration Errors

**Average per Month**

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Months</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>98</td>
<td>Sharp began medication barcoding deployment</td>
</tr>
<tr>
<td>2014</td>
<td>76</td>
<td>Sharp launches focus on “Always Events” for patient identification, line reconciliation, use of Alaris guardrails and Medication 6 rights</td>
</tr>
<tr>
<td>2015</td>
<td>66</td>
<td>Sharp launches system Bar Code Scanning Compliance reports</td>
</tr>
<tr>
<td>2016</td>
<td>62</td>
<td>Sharp launches HRO training</td>
</tr>
<tr>
<td>2017</td>
<td>51</td>
<td>Cerner Infusion Suite Auto Pump Programming Sharp Chula Vista</td>
</tr>
</tbody>
</table>

**C. No Harm - Reached Patient; No Monitoring and No Intervention Required**

**D. No Harm - Reached Patient; Monitoring Required**

**E. Harm – Temporary; Intervention Required**

**F. Harm - Temporary; Hospitalization or Increased Level of Care Needed**

**G. Harm - Permanent**

**H. Life Threatening Harm - Event required intervention necessary to sustain life**

**I. Death**

Sharp began medication barcoding deployment
Sharp launches focus on “Always Events” for patient identification, line reconciliation, use of Alaris guardrails and Medication 6 rights
Sharp completes medication barcoding deployment
Sharp launches system Bar Code Scanning Compliance reports
Sharp launches HRO training
Cerner Infusion Suite Auto Pump Programming Sharp Chula Vista
BCMA SCANNING COMPLIANCE

TARGET = 95% Medication Scanning Compliance

- Sharp Coronado
- Sharp Memorial
- Sharp Grossmont
- Sharp Chula Vista
- Sharp Mesa Vista
- Sharp Mary Birch
IDENTIFYING SPECIFIC SAFETY TARGETS

Preventable and Harmful Medication Administration Errors by Event Type 2013-2017

- Adverse drug event: 25, 28, 36
- Omission: 23, 23, 23
- Reversal Agent (include vent status, risk factors, med doses): 11, 11, 16
- Wrong dose/strength: 17, 11, 6
- Wrong medication: 8, 8, 6
- Wrong rate: 3, 4, 1
- Wrong route: 1, 1, 1
- Wrong time/frequency: 5, 1, 4, 5

Types of Harm:
- E. Harm - Temporary, Intervention Required
- F. Harm - Temporary, Hospitalization or Increased Level of Care Needed
- G. Harm - Permanent
- H. Life-Threatening Harm - Event required intervention necessary to sustain life
- I. Death
COMMUNICATING RESULTS
This represents a 48% decrease in preventable medication administration errors reaching our patients from 2013-2017
OUTCOME EVALUATION LIMITATIONS

- Reliance on self reported data
- Dependency on user managed compliance to the consistent and appropriate use of technology
- Timely reporting and resolution of gaps or barriers to process/technology
- Event classification disparities
- Some Improvements may also be attributed to other safety initiatives
- Not all units were leveraging barcoding technology
Extending the benefits of Barcode Technology- IV Medication
OUR SUCCESS WITH ADC MEDICATION SAFETY

Achieve Top Decile Results
- Advance Quality, safety, service, employee and physician measures
- Become a High Reliability Organization
- Leverage IT Systems to support quality and safety initiatives
- Operate as an optimal consumer centric system

- Utilize Key Pyxis project metrics we wanted to leverage for infusion: same scan compliance targets
- Translate of compliance to continuous quality improvement-safer conditions for patients

Integrated Delivery System Structure
- Advance population health through analytics and predictive modeling
- Innovate care delivery and technologies
- Support and improve patient alignment
- Further innovate and grow Sharp Health Plan
- Maintain and enhance payor relationships
IMPACT OF IV MEDICATION ERRORS TO PATIENT SAFETY

- Right patient
- Right medication
- Right dose
- Right time
- Right route
- Right documentation

Westbrook JI, Rob MI, Woods A, et al
Errors in the administration of intravenous medications in hospital and the role of correct procedures and nurse experience
Risk/Defect
• IV Medications have the highest risk for harm and medication errors

Goals
• Increase nursing awareness of IV Med Error risk
• Reduce programming errors
• Ensure that Nursing utilizes clinical knowledge and technology to complement safety efforts

Action Plan
• Identify how and when programming and administration errors are occurring
• Identify which errors will be mitigated using IV Interoperability
• Initiate comprehensive education program for Nurses
METRICS FOR SUCCESS

Compliance with Alaris Infusion Suite

Reduced Number of Errors noted during audits

Reduction in reported programming errors

- Compliance Data
- Errors not caught by Infusion Suite
- Infusion Pump error trends
- Prevalence Study
<table>
<thead>
<tr>
<th>Key Performance Indicators (KPIs)</th>
<th>Current Period</th>
<th>Previous Period</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infusion Alarms and Status Events</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Infusion Alarms</td>
<td>88210</td>
<td>84478</td>
<td>3732</td>
</tr>
<tr>
<td>Total Infusion Status Events</td>
<td>45687</td>
<td>52619</td>
<td>-6932</td>
</tr>
<tr>
<td><strong>All Infusion Reporting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Guardrails® Infusions</td>
<td>88.5%</td>
<td>87.5%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Guardrails® Infusions with Alerts</td>
<td>4.1%</td>
<td>4.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Patient ID Usage</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Percentage of Devices with Infusion Starts</td>
<td>30.7%</td>
<td>31.5%</td>
<td>-0.8%</td>
</tr>
<tr>
<td><strong>Alert Overview</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Guardrails® Alerts</td>
<td>3406</td>
<td>3858</td>
<td>-452</td>
</tr>
<tr>
<td>Total Potential Cost Avoided from Severe Harms Averted</td>
<td>$175,000</td>
<td>$262,500</td>
<td>-$87,500</td>
</tr>
<tr>
<td>Severe Harms Averted</td>
<td>20</td>
<td>30</td>
<td>-10</td>
</tr>
<tr>
<td>Canceled Infusions</td>
<td>475</td>
<td>492</td>
<td>-17</td>
</tr>
<tr>
<td>All Other Alerts</td>
<td>856</td>
<td>952</td>
<td>-96</td>
</tr>
<tr>
<td><strong>Good Catches</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reprogrammed Infusions</td>
<td>303</td>
<td>379</td>
<td>-74</td>
</tr>
<tr>
<td>Total &quot;Good Catches&quot;</td>
<td>18</td>
<td>23</td>
<td>-7</td>
</tr>
<tr>
<td><strong>Override Management</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total Override Alerts</td>
<td>2626</td>
<td>2987</td>
<td>-361</td>
</tr>
<tr>
<td>Override Alerts Reprogrammed within Guardrails® Limits</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>High Risk Overrides</td>
<td>44</td>
<td>55</td>
<td>-11</td>
</tr>
<tr>
<td>Overrides Completed in Less than 2 Seconds</td>
<td>56.3%</td>
<td>59.8%</td>
<td>-3.5%</td>
</tr>
<tr>
<td><strong>Library Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug Selection Canceled</td>
<td>364</td>
<td>471</td>
<td>-107</td>
</tr>
</tbody>
</table>
- Type of Infusion
- Date and time of infusion
- BCMA compliance
- Pump Association compliance
- Pump Programming compliance
- Event ID
- Order ID
- Bag #
- Med Admin Event
<table>
<thead>
<tr>
<th>Possible IV infusion errors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>Medication not infusing</td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td>Wrong rate</td>
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<td></td>
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<tr>
<td>Wrong medication</td>
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<td></td>
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<td></td>
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<tr>
<td></td>
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<tr>
<td>Discontinuation of medication</td>
</tr>
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<td></td>
</tr>
</tbody>
</table>

TECHNOLOGY/CLINICAL PRACTICE ERROR RISK REPORT
Alaris Infusion Suite

This NEW technology will AUTO-program the Alaris pump, thereby reducing manual key strokes by 60-70% and helping to reduce errors associated with:

- Wrong medication/concentration selections
- Wrong initial rate selections

However, there are many more errors that can happen when programming the Alaris pump and which are NOT detected by the new technology.

Do not over-rely on technology!

Always follow standard practice for medication administration via the "6 rights".

Note: There are some high risk medications which are excluded from the use of the new technology, including but not limited to:

- PCAs
- Epidurals

Also, remember that there are other errors that can occur (e.g., incorrect CERNER order entry of IV medication dose/rate or a wrong medication being entered under the wrong patient). Prescribers and Pharmacists are humans too. Thus, we all need to cross-monitor each other. So, have a

- Questioning Attitude and
- Validate and Verify!

Alaris Infusion Suite

<table>
<thead>
<tr>
<th>Potential Error</th>
<th>Example</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>PiPB not infusing</td>
<td>Forgetting to unclamp roller</td>
<td>“Don’t skip the drip”</td>
</tr>
<tr>
<td>Wrong rate</td>
<td>Forgetting to reconstitute</td>
<td>STAR (Stop, Think, Act,</td>
</tr>
<tr>
<td>modification of rate</td>
<td>powder</td>
<td>Review)</td>
</tr>
<tr>
<td>Titration of medication based on lab parameters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate modification on an existing order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in plain IV fluid (Infusion Suite cannot tell difference)</td>
<td>Switch from LR to NS</td>
<td>Compare drug label, pump settings and Cerner order/parameters</td>
</tr>
<tr>
<td>Line mix ups</td>
<td>Programming wrong drug to wrong channel</td>
<td>Manually perform “6 rights” Bedside barcoding can help in identifying error</td>
</tr>
<tr>
<td>Pharmacy label could be incorrect</td>
<td>2 bags of the same medication hanging on 2 separate channels. (Infusion Suite will chart as if you are hanging a new bag)</td>
<td>Complete line tracing comparing channel with actual medication</td>
</tr>
<tr>
<td>Pharmacy can place the wrong bar scan label on an IVPB (the small label placed on top of the larger label which contains the barcode for scanning, but not patient or medication information)</td>
<td>Complete line reconciliation and be mindful of IVPB hanging</td>
<td>Compare drug label, pump settings and Cerner order</td>
</tr>
</tbody>
</table>
## Monitoring for Risks Beyond Technology

**SMP Nursing Alaris Programming Prevalence Study**  
**PRE/POST** - Alaris Infusion Suite

### Name: [PLACE ON WOW CARD]  
### Unit: 

<table>
<thead>
<tr>
<th>In the last week how often did you find yourself or detected another person’s mistake of:</th>
<th>Error</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Forgetting to undamp a medication?</td>
<td>Self-reported (S)</td>
<td></td>
</tr>
<tr>
<td>2) Forgetting to dissolve a medication before infusing?</td>
<td>Cross- – monitoring (C)</td>
<td></td>
</tr>
<tr>
<td>3) Incorrectly setting up a line? (e.g., carrier solution, y-sting, primary vs. secondary line, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Infusing a medication at the wrong rate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4a) Initial rate?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4b) Subsequent rate change?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4c) What was the reason for choosing the wrong rate (e.g., confused with another med on line tracing, missed MAR, didn’t see that SID changed rate, etc.)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) Infusing the wrong medication?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5a) What was the reason for choosing the wrong medication? (e.g., confused with another med on line tracing, missed MAR, didn’t see leadback, cross- – monitoring, etc.)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) Not discontinuing a continuous drip in a timely manner?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) Any other errors caught not already captured?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8) Any other errors/vulnerabilities you have noticed with the current set up of Alaris Smart Pumps?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9) Any other comments:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Successes and Lessons Learned
WE ARE BEGINNING OUR HIGH RELIABILITY JOURNEY

- Systems approach to Medication Safety
- Process maturity approach
- Learning Health Systems Model
ONGOING IMPROVEMENTS TO PRACTICE

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Institute of Medicine

"... one in which progress in science, informatics, and care culture align to generate new knowledge as an ongoing, natural by-product of the care experience, and seamlessly refine and deliver best practices for continuous improvement in health and health care."

CONTINUING TO OPTIMIZE USE OF TECHNOLOGY TO IMPROVE SAFETY

✓ Standardization
✓ Frequency and process for updates
✓ Ensuring other safety processes are incorporated
✓ Establish target range measures that reflect minimum and maximum values
OPPORTUNITIES TO ANALYZE DATA WITHIN CONTEXT OF MEDICATION ADMINISTRATION

- Labeling
- Secondary Infusions
- Vital Signs
- Staffing Ratios

<table>
<thead>
<tr>
<th>EMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADC Dispensing</td>
</tr>
<tr>
<td>IV Infusion Admin</td>
</tr>
<tr>
<td>Admissions/Discharge/Transfers</td>
</tr>
</tbody>
</table>
ROBUST SOURCES OF DATA PROVIDE BEST INSIGHTS

- Relevance to each function
- Relevance to transitions between or shared functions
- When and to whom to provide granular information
- Engage to discuss relevance and impact of provided data and identify gaps
Closing Thoughts
Thank you
Reference/Omitted Slides
ENGAGE IN IMPROVING TECHNOLOGY OFFERINGS THROUGH INNOVATION

- Interoperability
- Integration
- Clinical and Operational Synergies
- Innovative Ideas and Insights
- Guidance on User Needs
Vendor Engagement and Expertise:
• By Project/Product: getting Cerner and Alaris together was a challenged in the beginning.
• Sharp, Cerner, BD came together for a series of successful implementation
• Post Implementation, there’s a challenge in understanding the data available – the continuity of the data
• From one system to another; creating gaps in potential analytics that may further contribute to
• Additional safety measures
Pump vendors: Alaris, CADD Solis

Software versions: All 2000 pumps need to be upgraded before the implementation – representing logistic issues

formulary and or DERs – had to consolidate several profiles into 2, one for Adult and Peds, the other for Neonates. This process took a significant amount of resources

The alignment of the Alaris Library to the Cerner Iv sets was manual, lengthy and detailed. It was estimated that took well over 1000 hours and took place over a 5 months period
Demonstrate and improve clinical excellence and exceed customer expectations.

Keep patients, employees and physicians safe and free from harm.

Create exceptional experiences at every touch point for patients and families, enrollees, physicians, partners and team members.

Create a values-driven culture that attracts, retains and promotes the best people who are committed to Sharp’s mission and vision.

Achieve financial results to ensure Sharp’s ability to deliver on its mission and vision.

Achieve net revenue growth to enhance market position, sustain infrastructure improvements and support innovative development.

Be an exemplary public citizen by improving the health of our community and environment.
IT Projects Addressing Risks

- **Cerner ePrescribe**
  - Intake
  - Discharge

- **Cerner Rules/Alerts (Leapfrog)**
  - Order Management
  - Verification
  - Administration
  - Discharge

- **Cerner NICU Opt and MAR**
  - Order Management
  - Administration

- **Cerner Infusion Suite**
  - Order Management
  - Verification
  - Storage/Dispense
  - Administration

- **Real-Time Medication Management Dashboard**
  - Administration

- **SurgiNet**
  - Transfer

- **Quality Measures**
  - Discharge
BCMA considerations

- Integrating Information into clinical decision making
- Advocacy through user buy in
- Minor policy changes in nursing documentation, medication administration, downtime procedures, scanner use
- Positioning BCMA as a safety benefit
ALARIS PUMP

Process or Outcome Metrics to assess the impacts of implemented measures.

1. Compliance with Alaris Infusion Suite (95% per nursing unit, at least 50% per individual nurse; goal by October 1\textsuperscript{st}, 2017) – will be compiled starting Q3 2017

2. Goal is reduced number of errors noted during prevalence audits (goal is reduction of number of errors over time) – first results back; see upcoming slides

3. Reduction in reported Alaris programming errors (RL events) (goal is a reduction of RL events over time) - will be compiled starting Q3 2017
Metrics to be used:

1. Compliance data on Alaris Infusion Suite along with Great catches, Missed Opportunities and Examples of errors Infusion Suite does not catch (Quarterly flyer mimicking current Barcoding Flyer)
2. RL solutions – Alaris pump IV administration errors – trend
3. Prevalence studies (comparison pre/post)
4. Carefusion report (see upcoming slide)
5. Additional metric: CADD Solis implementation of epidurals to reduce risk for 1) Wrong route error 2) accidental programming with Alaris Infusion Suite.
ARTICULATING PROJECT DELIVERABLES

Can data and relevance be presented based on audience and/or organization focus? IE C-Suite versus user; RN, Pharmacy, Safety, Quality, Etc
Impact of un-captured/out-of scope data

• Epidural
• PCA
• NICU
• OR
• L&D
• There is no close loop report from Cerner to Alaris Data
• Time saving value is hard to measured because of technology newness
• Safety value is hard to measure to data inconsistency
Opportunities for Med Projects

**Order Management**
- No policy for med order management
- Contrast excluded as meds

**Storage/Prep/Dispense**
- Non-profile Pyxis stations
- Pyxis profile overrides
- Kits and floor stock
- Many non-integrated applications

**Administration**
- Med Barcoding not fully implemented
- Pyxis profile overrides

**Transfer**
- Med reconciliation not consistently completed

**Planning for Discharge**
- Lack of favorable solution for Discharge process for physician med management
- Lack of favorable solution for Discharge process for nursing med management

**Discharge**
- Lack of favorable solution for cross-encounter med reconciliation
Use data to proactively manage

Use data to inform