Establishing a Sustainable Telehealth Infrastructure through a Regional Monitoring Center

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CHI Franciscan Health
Who We Are

• 9 acute care hospitals
  • Located in South King, Pierce, Kitsap Counties
  • 12,500 Employees

• Franciscan Medical Group
  • Harrison Medical Group
  • Highline Medical Group
  • Medical Staff 2400 providers

• Catholic Health Initiatives
  • Based out of Denver, CO
  • 105 acute care hospitals across 19 states
  • Provided nearly $1 Billion in charity care
CHI Franciscan Health
Who We Are

• Mission
  – To nurture the healing ministry of the Church by bringing it new life, energy and viability in the 21st century. Fidelity to the Gospel urges us to emphasize human dignity and social justice as we move toward the creation of healthier communities.
• Rapid expansion
  – 3 hospitals added over past 2 years
  – Growing geographic area

• EMR implementation (Epic) at all sites in 18 months
Economic Environment

• Reduced reimbursement
• Need for standardization and increased efficiencies
• Health care market environment
  – Competition
• Strong need for innovation to reduce cost, increase services
CHI Strategic Plan Framework
Alignment with our Sequential Focus

Three Work Streams of Our Strategic Plan

1. Maximize Clinical Operations
   - 2. Assume Performance Risk
   - 3. Manage Population Health

Regional Telemetry & Remote Monitoring Center

1. FTE Savings
   - 2. Reduce telemetry cost and improve care quality
   - 3. Regional telemetry establishes an infrastructure for additional remote monitoring
• Franciscan Virtual Urgent Care
  – 24/7
  – Free to Employees
  – Small Fee for virtual consult
  – Contracted Providers

• Telemedicine consults
  – Mental Health
  – Neurology
Regional Telemetry
Background and Evolution of Telemetry Monitoring

• **Telemetry: Remote cardiac monitoring**

• **Evolution of telemetry monitoring**
  – 15 years ago
    • RN monitors his/her own patients
  – 10 years ago
    • Monitors centralized to specific location and the Monitor Tech/HUC role created
  – 3 years ago
    • CHI Franciscan has multiple sites, different practices
    • The idea of a single patient monitoring center introduced and advanced
Standards/Benchmarks
2012-2013 Exploration of Telemetry Best Practices

• Published practices indicate a wide range of 20-70 patients monitored per telemetry tech
  – No evidence based practices

• Outreach and site visits
  – Cost savings
  – Technology
  – Infrastructure

• Centralized location
  – It is common to centralize telemetry within a hospital campus
  – Regionally centralized remote monitoring contemplated, but unclear about technology and business case
## Space Considerations
### Site Selection for Regional Monitoring Center

<table>
<thead>
<tr>
<th>Site Criteria</th>
<th>Option A</th>
<th>Option B</th>
<th>Option C</th>
<th>Option D</th>
<th>Option E</th>
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</thead>
<tbody>
<tr>
<td>Back-up power</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Cost</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>Too High</td>
<td>Too High</td>
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<tr>
<td>Network Capacity</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Off site from Hospital</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>Room for growth</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
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</tbody>
</table>
Regional Telemetry
Business Plan’s Opportunity Statement

• An opportunity exists to consolidate and standardize telemetry practices across the enterprise to achieve cost effectiveness and reduce variation

• With the foundational infrastructure in place, Franciscan will be able to build tele-ICU & other virtual health services

• Original capital request of $837k and projection to reduce 9.45 FTEs
## Current State (2013)

<table>
<thead>
<tr>
<th></th>
<th>Average Wage</th>
<th>Total Comp (With Benefits, 15% Nonproductive)</th>
<th>Total Labor</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>$15.30/hour</td>
<td>$19.27/hr</td>
<td>$1,559,148</td>
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<tr>
<td></td>
<td>$31,824 annual</td>
<td>$46,115</td>
<td>$1,590,330</td>
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<tr>
<td></td>
<td>2% Overtime (base salary)</td>
<td>$31,182</td>
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</table>

## Proposed State

<table>
<thead>
<tr>
<th>Tele per Tech</th>
<th>Core</th>
<th>Core + 15%</th>
<th>Fixed Cost (manager)</th>
<th>Annual labor cost (Core + 15% + 2% OT)</th>
<th>Annual Savings</th>
<th>Breakeven (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>23.94 FTE</td>
<td>27.5 FTE</td>
<td>$77,500</td>
<td>$1,371,025</td>
<td>$219,304</td>
<td>3.48</td>
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<tr>
<td>60</td>
<td>19.95 FTE</td>
<td>22.9 FTE</td>
<td>$77,500</td>
<td>$1,233,704</td>
<td>$356,626</td>
<td>2.14</td>
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<tr>
<td>70</td>
<td>17.1 FTE</td>
<td>19.6 FTE</td>
<td>$77,500</td>
<td>$999,431</td>
<td>$590,898</td>
<td>1.29</td>
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</tbody>
</table>
Regional Telemetry
Development Timeline

2012
- Early 2012: Concept proposed

2013
- Early 2013: Research and site visits
- July 2013: Business plan completed and funding approved

2014
- November 2013: Workflow development initiated
- April 2014: Network solution reached
- August 2014: Construction begins; equipment installed and tested
- September 2014: Centralized Monitoring implemented
Standardization of Monitor Tech Role and Training
Results of 5 All Day Facilitated Work Sessions

• Representative clinical managers and other Key Stakeholders
  – Define standard workflows
  – Workflows continued
  – Define work assignment rules / responsibilities
  – Communication and documentation standards
  – Downtime process and implementation planning

• Addressed standardization of wide variation in workflow processes

• Training and job descriptions were standard at all facilities including:
  – Completion of Monitor tech program
  – Completion of EKG class
  – Annual training including rhythm training
Regional Telemetry
Staffing Model

• Staffing
  – 24/7/365
  – 12 hour shifts
  – Shifts changes are at 0600 and 1800 with a 30 minute overlap
  – We staff four 12 hour techs for each shift
  – We have one 8 hour relief person for breaks
  – Most staff are 0.75 or 0.9 FTE
  – We have 34 staff including 4 PRN

• Work stations
  – Four work stations each with a possibility of 128 patients
  – Average for each station is 60 to 70 patients
Space Considerations
Configuration Uniquely Suited to Workflow and Technology
Connectivity
Engineering a Secure Metro-Ethernet Landscape

Near real time applications are intolerant of latency — Gbps max latency is a must have — network needs to be monitored 24x7.

If additional applications are added to this network — QoS should be implemented to protect Philips data.

TCP/IP connectivity

Century Link WAN
EIGRP 200
Networks
10.10.10.16/30
10.20.20.16/30
192.168.40.0/24

Century Link 2911
Layer III
10.20.20.17/30

Century Link
Layer III
To Franciscan
for printing

Franciscan network

FESC Building Remote Cockpit
Tacoma, WA

Other caveats to consider:
- Gig or 100mb connection from the Cisco 2960's into Century Link infrastructure.
- Philips 2900 switches need to be consolidated in one MDF / IDF or homerooms to one location or additional hospital appliances will be added.
- Central stations may need to be re-purged.
- Layer III connectivity between Philips and Century Link equipment.
- Each 16 client sector requires 512mb bandwidth; each facility has respective sector layout.

VLAN 202
32 Remote Clients – Typical
Default gateway
192.168.40.1/24

100mb connections to switch

New Cisco
2960XR's
Leading the Change
Kotter’s 8 Step Model

• Burning Platform
  - Improve Quality
  - Improve Safety
  - Improve Outcomes
  - Economies of Scale
  - Reduce Labor Costs

• Powerful Coalition
  - Executive Support
  - Clinical Support
  - Provider Support
  - Vendor Support
  - IT Support
Leading the Change

• Vision
  - Patient Safety
  - Reduce Variation
  - Cost Effectiveness
  - Future State

• Communicate
  - Key Stakeholders
  - Open Forums
  - Presentations
  - Impromptu Discussions
Leading the Change

• Remove Obstacles
  - Miscommunication
  - Fear
  - Concerns
  - Exclusion
  - Technology
  - Capital

• Wins
  - Capital
  - Leader
  - Idea Sharing
  - Schematic
  - People
  - Technology
  - Blessing
Leading the Change

• Building
  - Successes:
    • Launched
    • Hiring
    • Infrastructure
  - Opportunities:
    • Physician engagement
    • Technology
    • Downtime

• Anchoring
  - Data Sharing
  - Success Stories
  - Near Misses
  - Succession Planning
Quality

- People
  - Hiring Practice
  - Competency Verification
  - Performance Standards
  - Behavior Standards

- Processes
  - Reduced Distractions
  - Standardization
    - Patient/Tech Ratio
    - Rhythm Changes
    - Emergency Response
    - Downtime
    - Escalation
Regional Telemetry

Results

• $1 million capital and reduction of 65 positions down to 34 positions
  – Project a 1 year payback on investment

• Currently Largest Philips Telemetry Monitoring Center in the nation serving 528 beds

• As of March 2015, over 1,000,000 hours of safe, consistent patient monitoring
  – 230-290 patients per day
  – Downtime limited to 28 hours total
  – Operational hours 4,440 as of 3-31-15
Regional Telemetry
Results

• Patient Outcomes

• Clinical response time
  – Rapid Responses
  – Code Blues
  – Near Misses

• CHI Franciscan Health Incident Tracking
  – IRIS reports

• Staff feedback
• Patient safety impact is significant
  – Earlier recognition and reporting of rhythm changes
  – Patient off leads who had fallen
  – V-tach – tech called code Blue
  – ST segment elevation 0.75 up to 1 in 30 minutes RN called labs ordered 60 minutes ST now 2.5 patient to cath lab much sooner for intervention
  – Patient’s HR doubled, tech unable to reach RN, called Rapid Response – patient resuscitated and transferred to ICU in a timely manner
Regional Telemetry
Learnings and Next Steps

• What we’ve learned:
  – Communications
  – Staffing
  – Standards
  – System level issues and solutions

• Regional telemetry next steps:
  • Expansion to three newly acquired hospitals
  • Reduce inappropriate telemetry use
  • Expansion to external organizations
Building on Successes
CHI Franciscan’s Virtual Health Services

• Expansion of Virtual Health Services
  – Tele-ICU
  – Virtual Companion
  – Virtual Nursing
  – And more!
Thank you