Sustaining high reliability in the face of hospital organizational change: A pilot study

Duke/University of North Carolina
Health Informatics Series Seminar

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Objectives

- Identify strategies that may help hospital staff maintain safe, effective care while mastering new work processes

Topics

- Current state of EHR hospital implementation
- Reframe implementation through a high reliability lens
- Identify potential measures of care delivery
Hospital adoption of EHR systems has increased more than five-fold since 2008.

Figure 1: Percent of non-federal acute care hospitals with adoption of at least a Basic EHR system and possession of a certified EHR: 2008-2013

- Basic EHR System
- Certified EHR

Incentives Begin

<table>
<thead>
<tr>
<th>Year</th>
<th>Basic EHR System</th>
<th>Certified EHR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>9.4</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>12.2*</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>15.6*</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>27.6*</td>
<td>44.4*</td>
</tr>
<tr>
<td>2012</td>
<td>85.2*</td>
<td>94.0*</td>
</tr>
<tr>
<td>2013</td>
<td>59.4*</td>
<td></td>
</tr>
</tbody>
</table>
Background

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One Implementation Journey: UNCHS

- 2013 – Under Contract
- 2014 – Go Live
  - UNC Hospitals (Chapel Hill)
  - Rex Hospitals
- 2015
  - New applications (Cardiology, Transplant, Laboratory Services)
- 2016
  - Highpoint/Johnston/Cadwell/Pardee community hospitals
  - New applications: (Case Management, Home health, triage)
- 2017
  - Nash Community Hospital
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Organization Outcomes

- Increased cost / decreased reimbursement \(^2,3\)
  - EHR investment
    - Duke- $700 million
    - Boston Partners $700 million
    - UCSF $150 million
  - Unexpected impact on charge capture
- Failed interoperability \(^4\)
  - Barriers to expected care coordination
Patient Outcomes

- No Effect
  - Mortality rates: CABG, Stroke, Pneumonia
  - Chemotherapy orders

- Marginal improvements in care
  - Hospital acquired pressure ulcer

- Increase incidence of harm
  - Pressure ulcer, Falls
  - Leave without being seen
  - Medication errors
  - Failure to rescue
Negative End User Experience

- Staff burden
  - Cognitive effort
  - Time diversion
  - Increased multitasking
- Fragmented workflow
- Disrupted care processes
Negative End User Experience

Physicians (n=1,200)$^{14}$
- 59% cost ≠ benefit
- 49% not designed for physicians

Nurses (n=14,000)$^{15}$
- 92% nurses dissatisfied
- 85% nurses struggle
- 90% disrupt communication with patients
- 89% work around the system
Assumptions at Work

Former CIO reports on Epic EMR rollout

QUESTION:

As you approach go-live within a couple of weeks, how is the Epic EMR rollout going?

http://bcove.me/578nbdii
Unsubstantiated Support Strategies \textsuperscript{2, 15, 16, 17, 18}

- Management/supervisor support during Go-Live\textsuperscript{12}
  - Command center
  - Application specialists
    - Speedy fixes
  - Roving teams
    - Early ID of problems
  - ~ 7 days duration

- End user training
  - One on one
  - Just in time
  - Scenario based
  - < 30 days prior to go live

- Superuser
  - Just in time peer coach
  - 1-2 weeks
Reframing Implementation: HRO \(^{19, 20}\)

- High Reliability Organizations
  - High-risk
  - High potential for error
  - Errors → Significant drastic consequences
    - Loss of life or limb
- Highly Reliable
  - Systematic systems
  - Consistent goal achievement
  - Obsessed with anticipating and avoiding problems
High Reliability Organizations 19, 20

- Sensitive to operations
- Reluctant to accept “simple” explanations
- Preoccupation with failure
- Defer to expertise not rank, power, position
- Resilient, responsive, improvising
High Reliability Organizations 19, 20

- Reluctant to accept “simple” explanations
  - Dig deep to find the real source of problems
- Sensitive to operations
  - Observe effect of processes and systems on the organization
  - Identify what is/is not working
  - Observations communicated
- Preoccupation with failure
- Defer to expertise not rank, power, position
- Resilient, responsive, improvising
Pilot: Developing measures

- **Setting**
  - Single health system
  - 12 months use of Certified EHR
  - Consistent implementation strategies

- **Sample**
  - Adult Intensive care & step down units
Methods: Data

- Nursing documentation
  - Execute tasks on behalf of others
  - Timed care tasks
  - Shift workers

- Examples
  - Pain medication efficacy documentation

- Controls
  - Staff composite (skill mix, education)
  - Patient composite (case mix, ADT)
Methods: Data (Missed Care)\textsuperscript{21, 22}

- Comfort patients
- Nursing care plans
- Education
- Oral hygiene
- Document nursing care
- Conduct patient surveillance
- Plan care
- Reposition patient
- Skin care
- Prepare discharge
- Admin medications
- Pain management
- Treatments/procedures
Methods: Data

- Feasibility
  - Availability, quality and validity of the data
    (Future-may vary across vendors and vendor installs)

- Single unit trend
  - Average number missed per shift
  - Trends in association with go live

- Cross unit comparison
Next steps

- Prevalence and trends of missed care
- Determine the association between missed care, patient safety outcomes and satisfaction.
  - How these change over time
  - How they differ across different types of change (disruption)
    - HIT: version release, upgrades, new functionality
    - Non-HIT: emergent crises, care process changes
- Identify interventions that promote care completion
References


References


References


