Workflow Redesign in Support of the Use of Information Technology within Healthcare

Conflict of Interest Disclosure

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- Kelly Sager
- Adrish Sannyasi, MBA, PMP, CPHIMS

Have no real or apparent conflicts of interest to report.
Presenters & Moderators

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- Kelly Sager
  Marketing Manager, eHealth Solutions, GE Healthcare
- Adrish Sannyasi, MBA, PMP, CPHIMS
  Manager, Deloitte Consulting

Organizational Panel

- To be determined
Objectives

- To inform the audience of a recently published HIMSS toolkit on workflow redesign

- To provide an overview of ten organizational case studies featured in the toolkit, focusing on four aspects:
  
  ![Diagram showing People, Process, Technology, and Achieving Excellence]

- To provide the audience with an opportunity to interact with a panel made up of individuals who were interviewed for this publication

Toolkit Content
Why Workflow Redesign?

• Improve quality
• Reduce costs
  • Eliminate waste
  • Focus on value (patient, provider, staff, organization)
  • Reduce cycle time
  • Reduce variation
• Improve process
  • Bad paper process = bad electronic process

Why Workflow Redesign?

• Obtain “quick wins”
• Reduce time spent on design
• Promote clinical staff involvement
• Ease electronic medical record (EMR) adoption
• Support EMR sustainability
Workflow Design Concepts

• Think healthcare delivery as a “system” with a large number of components
• Focus efforts on reducing non-value added activities
• Reduce backlogs or wait times & consider parallel execution

• Focus on total value stream improvements, not on localized improvements
• Use industry standards such as Unified Modeling Language (UML) & Business Process Modeling Notations (BPMN) to map workflow

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Five Step Design Guidelines

Step 1: Current State: Review existing process

Step 2: Future State: What and why?

Step 3: Future State: How?

Step 4: Future State: Who?

Step 5: Maintain: Implement, measure, improve

Workflow Design Tools

- Visio flowcharting
- UML & BPMN modeling software
- Business Process Management suite
### People

**Lucile Packard Children’s Hospital at Stanford**  
**Palo Alto, CA**

<table>
<thead>
<tr>
<th>Facility</th>
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<tbody>
<tr>
<td>• 280 active beds &amp; several highly active clinics, located on Stanford University campus</td>
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<tr>
<td>• Ranked in the top ten pediatric hospitals - 2008 U.S. News and World Report</td>
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<table>
<thead>
<tr>
<th>Goal</th>
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<tbody>
<tr>
<td>• Implement computerized provider order entry (CPOE) &amp; clinical documentation</td>
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<thead>
<tr>
<th>Process</th>
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<tr>
<td>• Brought in expert on change management for lectures &amp; group sessions</td>
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<td>• Demonstrated leadership commitment through active participation</td>
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<td>• Emphasized quality improvement, safety benefits &amp; clinical care efficiencies</td>
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<tr>
<td>• Clearly communicated benefits on a regular basis</td>
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<tr>
<td>• Conducted training sessions lead by peers (e.g. a physician taught physicians)</td>
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<td>• Surveyed users to gather feedback</td>
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<tr>
<th>Outcomes</th>
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<tr>
<td>• Highly successful implementation - CPOE used for 97% of orders in first month</td>
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<tr>
<td>• Widespread agreement that no one wanted to return to life before CPOE</td>
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Medical University of South Carolina
Charleston, SC

Facility
- 709 licensed beds and 776,000 ambulatory care visits a year
- 705 affiliated physicians, 545 residents, and 11 hospitalists on staff

Goal
- Implement a large-scale core clinical information system

Process
- Included executive sponsors and project leaders from the clinical areas
- Created five nursing informatics specialist positions to liaise with clinical staff
- Implemented governance structure including key senior clinical & administrative leaders
- Formed implementation oversight committees reporting to project steering committee
- Offered incentives such as pizza lunches & ice cream socials to reward contributors
- Identified four physicians & allocated 25% of their time to serve in an advisory capacity

Outcomes
- Successfully ensured adoption of clinical information system including CPOE and clinical documentation by leveraging provider participation during implementation
### Fox Chase Cancer Center

**Philadelphia, PA**

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<td>- 100 bed cancer center focused on patient care, cancer research &amp; cancer prevention</td>
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<td>- Ranked as one of the top cancer center hospitals by U.S. News and World Report</td>
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<tr>
<td>- Automate coding workflow using an application which maintains a workflow engine</td>
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<th><strong>Process</strong></th>
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<tr>
<td>- Workflow analysis using flowcharts of each area to support remote coding</td>
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<th><strong>Outcomes</strong></th>
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<tr>
<td>- Created a paperless environment</td>
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<td>- Improved coder productivity</td>
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<td>- Reduced unbilled outpatient accounts by $11M in two months</td>
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<tr>
<td>- Increased management’s ability to adjust work distribution based on chart volumes</td>
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### Loma Linda University Medical Center

**Loma Linda, CA**

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<tr>
<td>- 900 bed university medical center focused on adult, children and behavioral medicine</td>
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<td>- International leader in infant heart transplantation and proton cancer treatment</td>
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<th><strong>Goal</strong></th>
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<tr>
<td>- Implement inpatient clinical documentation and e-MAR and an ambulatory EMR</td>
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<tr>
<td>- Inventoried existing hard copy documentation</td>
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<tr>
<td>- Online clinical documentation in the acute environment including medication documentation</td>
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<tr>
<td>- Implementation of an ambulatory EMR which is ongoing at this time</td>
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### MCGHealth, Inc.

**Facility**
- 478 bed adult & 154 bed children’s medical centers; ambulatory & specialized centers
- Recognized as a Top 100 Hospital organization

**Goal**
- Deploy a fully-integrated clinical solution

**Process**
- Focused first on clinical transformation – created clinical transformation team
- Engaged consulting firm on first implementation project to train on transformation techniques and provide knowledge transfer
- Held senior executive meetings weekly to review project, budget & to mitigate issues
- Required deep involvement of key stakeholders (physicians & other clinicians)
- Provided financial remuneration to physicians who were heavily involved in the project
- Instituted a formal change management process

**Outcomes**
- Projects remained on time and within budget
- Achieved buy in from executives and key stakeholders due to their involvement

### Seattle Children’s Hospital

**Facility**
- 250 bed children’s hospital affiliated with the University of Washington
- Top children’s hospital for 17 consecutive years – U.S. News and World Report

**Goal**
- Replace obsolete system using continuous performance improvement (CPI) principles

**Process**
- Instituted a CPI management system 10 years ago based on Toyota Production System to transform healthcare
- Goal has been to remove waste and create value for patients and their families
- Focused on the revenue cycle system implementation by:
  - Involving people that do the work
  - Standardizing process and tools
  - Developing error-proof processes
  - Maintaining customer focus
  - Always asking why?

**Outcomes**
- Technology no longer seen as the “answer”, but as an enabler to sound work processes
## Facility
- 550 bed and 24 bassinet tertiary and quaternary hospital
- Holds magnet status for nursing from the American Nurses Credentialing Center

## Goal
- Implement an electronic health record (EHR) system

## Process
- Developed a project philosophy that was centered on the patient and branded the project O2 which stood for “Optimal Outcomes”
- Involved key executives in product selection & implementation
- Appointed a chief medical information officer & established a core physician workgroup
- Developed an advanced clinical information systems team to work with the information technology (IT) department on design and to flowchart current/future states
- Designed and built the system in parallel
- Instituted an early change management process
- Engaged an external consultant to moderate the process

## Outcomes
- Phased, ongoing approach for implementation of the EHR

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## Technology

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Blessing Hospital
Quincy, IL

Technology

Facility
- 310 bed community hospital; draws patients from a 100 mile radius and serves northeast Missouri, western Illinois & southeast Iowa; largest health system in area

Goal
- Implement an EMR system

Technology
- Utilize wireless infrastructure; Citrix provides remote access from home & office
- Hardware includes desktops, laptops, tablets, carts & touch pens/screens
- Utilize 18 servers structured in clusters which have fail over ability; servers set in an active/passive cluster
- Server monitoring handled through alerts & received by a technical team
- Development & testing is done internally with vendor support & end user involvement – new process flows are also tested during the testing phase
- Four environments maintained – testing, training, development & production
- Maintain a project management office; use Lean Six Sigma process
- Interdisciplinary clinical design team used for system design, workflow redesign & approval of system optimizations

Technology

Blessing Hospital
Quincy, IL

Technology
- Implemented structured downtime procedures & processes
- Clinicians can only access patients assigned to their floors and work stations
- Physicians can only see patient data on patients in which they are providing care
- Over-ride function available for consultants
- Utilize break the glass, as needed, to access patient chart for care purposes
- Remote access must be reapplied for annually; special procedures in place for physician office staff & students
- Higher level of security maintained for psychiatric records
- Compliance department performs routine audits to assure appropriate access

Benefits
- ED orders placed electronically 100% of the time
- ED triage time reduced 60%
- Pharmacy turn-around time reduced 24%
- Performance related calls down 75%
- Order modification decreased from 5.8% to 0.6%
- No documentation issues during last Joint Commission survey – first time in 20 years
Denver Health
Denver, CO

Facility
- 500 bed teaching hospital which serves as the safety net hospital for the State of Colorado – Motto is "to provide level one care for all"
- Awarded the 2009 University Health System Consortium Rising Star in Safety & Quality award

Goal
- Improve quality & enhance patient & organizational value; Utilize the EHR as a goal enabler

Technology
- Robust Cisco infrastructure network; one gigabyte backbone; fully-distributed
- SONET ring (10 megabyte) is used to support the ambulatory health centers
- Utilize two data centers, fully provisioned with redundant power & redundant cooling
- Servers are standardized on Dell as the base hardware – heavily virtualized operation
- Run geographically tolerant storage database; fully-replicated across data centers to assure 99.9% availability
- Zero client PC environment is maintained with Citrix as the back end
- Access gained with smart cards to thin clients; two factor authentication required
- Hardware is standardized to ease maintenance & control costs

Technology
- Monitoring systems are used that send alerts to support staff for infrastructure issues
- Development is done internally with some outside consultants used
- Nurses and physicians are heavily involved in system design and testing
- LEAN concepts from the Toyota Production System have been adopted for system development, testing & implementation of systems
  - Vertical value stream assessments & rapid improvement events are utilized to identify current, ideal & future states
  - Use iterative cycles of design-develop-test for rapid development of applications – eliminated development rework
- Training includes hands-on, web-based & at-the-elbow training
- IT partners with vendors to provide enhanced products & services on aggressive timelines
- Utilize dedicated project managers & proven project management methodologies
- Projects are supported by the hospital Board & Chief Executive Officer
- Project governance includes key stakeholders & vendor partners
- Merged IT & health information management departments
- Learned through experience to focus on workflow and then technology
- Use objective measures to demonstrate the value of technology investments
Denver Health
Denver, CO

Benefits
• Using LEAN, have reduced development time by up to 50% and implementation costs by 30%
• CPOE has provided an 83% reduction in turn-around time for medication orders
• Demonstrated medication risk avoidance of approximately 300 doses/month
• Reduction 400,000 pharmacy call-backs to clarify orders
• Order legibility has improved 100%
• At level five on the HIMSS EMR analytic model. Once physician documentation is implemented, Denver Health will move to level seven

MCGHealth, Inc.
Augusta, GA

Facility
• 478 bed adult & 154 bed children’s medical centers; ambulatory & specialized centers
• Recognized as a Top 100 Hospital organization

Goal
• Deploy integrated clinical solutions across the enterprise

Technology
• Robust infrastructure with clustered servers and high availability fail-over capabilities
• Building a disaster recovery system for continuity and sharing information with partners
• Public and private wireless networks available throughout the enterprise
• Physicians use handhelds and blackberry devices in addition to laptops
• Utilize bedside workstations and computers on wheels
• Utilize single sign on for clinical applications – testing smart cards & biometrics
• Onsite desktop support at the hospital – data center is offsite
• Systems are monitored 24 x 7; on call system to resolve issues
• Shared project management between a project manager, IT lead & operational project lead
• Most application development done internally – consultants used for go live events
### Technology

**MCGHealth, Inc.**
**Augusta, GA**

- Use an interdisciplinary clinical transformation team responsible for workflow redesign, system design & testing
- Use “super docs” for testing of physician functionality & for training other physicians
- Clinical application team is small, lean & productive; projects completed on time & under budget
- End user support provided by an RN-staffed clinical response team on a 24 x 7 basis
- Physician executive team reviews and approves system enhancements
- Downtime procedures are required of each hospital department
- Interdisciplinary downtime group meets monthly to plan for scheduled downtime
- Web-based applications have been developed to support registration, order entry & medication administration during downtime; for ambulatory care similar applications exist for the problem list, allergy list & medication records
- Serve as a developing partner of the East Georgia Healthcare Cooperative which will allow for an exchange of patient data with a neighboring county

### Benefits

- Quantifiable benefits not obtained
Eastern Maine Medical Center
Bangor, ME

**Facility**
- 2008 Nicholas E. Davies award winner for organizational excellence
- 411 bed tertiary care center – hub referral hospital for 21 hospitals
- Participates in the Maine HealthInfoNet project

**Goal**
- Clinical transformation (patient safety & quality) – technology served as an enabler
- Have all providers treat a patient using a single, shared electronic system
- Design, build & maintain an EHR

**People**
- Developed defined structure, accountable to hospital Board & health system’s governance committee
- Provided hospital & medical staff leadership support
- Established project management office
- Developed an EHR roadmap guided by the HIMSS EMR analytic model
- Involved day-to-day staff & physicians in decisions

**Process**
- Assigned project managers for each project
- Followed Project Management Institute (PMI) practices when managing projects
- Used LEAN methodology for process redesign
- Established patient first care coordinator positions
- Introduced a formal change management program
- Required that all users demonstrate EHR competency before system use

**Technology**
- Required information technology transparency – encouraged input from end users & conveyed the status of all submitted tickets via an online system
- Allowed end users to select their own hardware devices
- Continues to use dashboards to provide real-time data on cost & quality to physicians
- Continues to devote sufficient time to planning for the future & to the analysis of completed projects to establish best practices
Eastern Maine Medical Center
Bangor, ME

Outcomes

- Nicholas E. Davies Award for Organizational Excellence
- Decreased medication errors
- Improved overall efficiency
- Reduced the cost of providing care
- At level four on the HIMSS EMR analytic model at the time of the Davies award.

Eastern Maine Medical Center plans to be at level seven in 2011

Lessons Learned

- Assuming selection of a certified product, organizational culture and effort rather than product is a better predictor of success.
- Workflow processes must be re-engineered, including clinic policies and procedures, job descriptions, and scheduling and billing workflows.
- Involve stakeholders from the beginning. Physician involvement is key to success.
- Develop a plan to manage change and provide governance to ensure rapid decision making.
- Demonstrate the support of senior leadership, communicate frequently and build consensus.
- Train end users by hospital staff members who understand the culture and workflows.
Accessing HIMSS Workflow Toolkit

- HIMSS members can obtain the workflow toolkit by accessing the HIMSS website and clicking on Topics & Tools > Electronic Health Record > EHR Adoption

Panel Discussion

Thank You for Your Attention & Participation