Beyond the EHR. What is Next for Nursing Informatics?

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Objectives

• The participant will describe two or more national initiatives that impact Nursing
• The participant will cite one or more examples of Nursing Informatics value post EHR implementation
• The participant will identify two or more emerging technologies that will impact Nursing practice
How Did We Get Here?

**The Meaningful Use Era**
- Government Funded Health IT Investments
- Rapid implementation of Electronic Health Records
- NI Value: Leadership, Implementation, Achieving MU goals

**The Post Meaningful Use Era**
- Will government programs continue to drive IT prioritization?
- Continue to invest in, optimize and squeeze value out of the 'EHR
- NI Value: What is the role of NI?
<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>2010</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 7</td>
<td>Complete EMR, External HIE, Governance, Disaster Recovery</td>
<td>1.0%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Stage 6</td>
<td>Technology enabled medication, Blood &amp; Human Milk</td>
<td>3.2%</td>
<td>33.8%</td>
</tr>
<tr>
<td>Stage 5</td>
<td>MD Documentation, Intrusion/Device protection</td>
<td>4.5%</td>
<td>32.9%</td>
</tr>
<tr>
<td>Stage 4</td>
<td>CPOE with CDS, Business Continuity</td>
<td>10.5%</td>
<td>10.2%</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Nursing Documentation, eMAR, role based security</td>
<td>9.0%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Stage 2</td>
<td>CDR, Internal Interoperability, basic security</td>
<td>14.6%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Stage 1</td>
<td>+ PACS, DICOM</td>
<td>7.1%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Stage 0</td>
<td>All 3 ancillaries. Pharmacy, Lab Radiology</td>
<td>10.1%</td>
<td>1.4%</td>
</tr>
</tbody>
</table>
UMass’s Epic Journey

One Patient, One Record
### Epic Project Implementation Timeline

**Milestone Legend:** Black = Planned, Green = Completed on Schedule, Gold = Completed Early, Red = Milestone Missed

#### Phase 1: Academic EMR
- **Soarian Exit Strategy**
- Sign Contract 7/27
- **Phases 1 and 2: UMMMC, UMMMG, Clinton, Marlborough, HealthAlliance, ACO Healthy Planet Modules, Epic Data Feed to UMMS Clinical Data Repository**

#### Phase 2: UMMMC, UMMMG, Clinton, Marlborough, HealthAlliance, ACO Healthy Planet Modules
- **Phases 1 and 2: UMMMC, UMMMG, Clinton, Marlborough, HealthAlliance, ACO Healthy Planet Modules, Epic Data Feed to UMMS Clinical Data Repository**
- **Design, Build, Validate**
- **Integration Testing**
- **Stabilize**

#### Phase 3: Community Healthlink (CHL)
- **Plan/Imp. On Hold**
- 1st Site Declined
- **Phases 4: Affiliates (Community Connect)**
- **Develop Program Strategy & Approach**

#### Phase 4: Affiliates (Community Connect)
- **Develop Program Strategy & Approach**
- **Pop Health & Enterprise Analytics**
- **Enterprise IS & Clinical Engineering Support**
- **Enterprise IS & Clinical Engineering Support**
- **Enterprise Informatics & Optimization**
- **Pop Health & Enterprise Analytics**
- **Enterprise IS & Clinical Engineering Support**

#### Milestone Slipped
- **Milestone Slipped**

#### Stabilize
- **Stabilize**
- **Milestone Slipped**

#### 2015
- **Q1**
  - Sign Contract 7/27
- **Q2**
  - v. 2015 Installed 3/31
  - 0
- **Q3**
  - Design Done 3/31
  - Build & Workflow Adoption Done
  - Begin Testing
- **Q4**

#### 2016
- **Q1**
  - Content Done 3/31
  - Milestone Slipped 9/31
- **Q2**
  - 1/2 Transition from “Build” to “Run”
- **Q3**
  - 10/1 Phase 1 & 2 Go-Live
  - 10/1 End User Training Done
  - 8/25 -> 9/30 Infrastructure Ready
- **Q4**
  - 6/30 Testing Done
  - 8/14 Begin User Training

#### 2017
- **Q1**
  - 10/1 Phase 1 & 2 Go-Live
  - 1/2 Transition from “Build” to “Run”
- **Q2**
  - 8/25 -> 9/30 Infrastructure Ready
- **Q3**
  - 10/1 End User Training Done
- **Q4**
  - 6/30 Testing Done
  - 8/14 Begin User Training

#### 2018
- **Q1**
  - 1/2 Transition from “Build” to “Run”
- **Q2**
  - Extend Community Connect to Affiliates
- **Q3**
  - Double Upgrade: Plan, Implement Version 2016/2018
- **Q4**
  - Continue Infrastructure Modernization 2018 Phases

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**Updated Oct 2018**

**Phases 1 and 2: UMMMC, UMMMG, Clinton, Marlborough, HealthAlliance, ACO Healthy Planet Modules, Epic Data Feed to UMMS Clinical Data Repository**

**Major Go-Live**

**Community Connect Partner Opted Out**
Organizational Change Theory: "Valley of Despair"

Hospital Proficiency/Patient Care Quality as a Function of Time When Implementing an EHR

- System Activated Transformation Initiated
- Work Proficiency Drops
- Quality Improves Moderately

- "Valley of Despair" Proficiency at lowest point
- Adoption plans are critical

- Most Difficult Months For UMMHC

- Hospital Proficiency as a Function of Time When Implementing an EHR
- Patient Care Quality as a Function of Time When Implementing an EHR

Most Difficult Months For UMMHC
“We couldn’t have done this without you!”
– Linda Scoble

“It was reassuring to see the EIPs in the command center after go-live; they were ready to help with any issue that arose. They always displayed a professional attitude and the smiles on their faces were infectious.”
– Deb Turner

“Words cannot express the pride we have for each and every one of you! You took the EIP position and made it your own while staying positive and embracing such a major change called EPIC.”
– Melissa Ryzewski & Kerrie Singer

“The EIPs were terrific to work with—smart, positive, full of energy, detailed investigators—problem solvers!”
– Judy Connelly

“Humble Epic Heroes, exceeded all expectations and raised the bar for any new grad to follow in their footsteps.”
– Karen Uttaro

“The EIPs I worked with demonstrated such strong critical thinking and problem solving skills, patience with learners and flexibility. What a great addition to our nursing workforce.”
– Kathy Brule

“Thank you for your help!! Great job!! Flexible and dependable.”
– Edyta Soltan

“Each will be an asset to the Med Center since they are starting with a solid knowledge base in Epic and many nursing workflows through their teaching of PIT scenarios.”
– Kathy Clement

“Thank God for the EIPs! They were so capable and involved from very early on, it was impressive to say the least. They are off to a great start of some very promising nursing careers.”
– Timily Kennedy
Nursing & Informatics

Putting It All Together !!
Nelson’s: Data to Wisdom Continuum

- **Data**: Naming, collecting, organizing
- **Information**: Organizing, interpreting
- **Knowledge**: Interpreting, integrating, understanding
- **Wisdom**: Understanding, applying, applying with compassion

Increasing Interactions and Interrelationships

Increasing Complexity
NI Role During “Implementation”

- Focus has been on the SDLC
- IT dominates early phases; with operational “input”
- Operations becomes “owner” with IT in support role
Post EHR Challenges

- Unintended Consequences
- Workarounds
- **Communication Challenges**
- Workflow Changes
- Click Overhead
- **Reporting & Analytics**
- Data Rich; Information Poor
- Resource Constraints
- Optimization

- **Optimization**
- Review Nursing Data Sets
- Eliminate Redundancy
- ↓ Click Overhead
- Provide Mobility
- Standard Work
- Best Practices
- Identify Enhancements
...and that is why we lift on three...
The Russians were a minor enemy. The real enemies were cholera, typhus, and dysentery. Once the military looked at that eloquent graph, the modern army hospital system was inevitable.

Florence Nightingale, 1856
Reporting Maturity

- **Descriptive Analytics**: What happened?
- **Diagnostic Analytics**: Why did it happen?
- **Predictive Analytics**: What will happen?
- **Prescriptive Analytics**: How can we make it happen?

**Axes**:
- **Value**
- **Difficulty**
- **Insight**

**Phases**:
- **Information**: Hindsight
- **Optimization**: Foresight

**Legend**:
- Gartner
If the average length of stay in a hospital is 4.8 Days

One Year in the Life of our Patients ........

The other 360.2 Days !! 98.69%

Our EHR Data !!! 1.31%
Vast amounts of data that can have a great impact on our health remains.

It is estimated that 80% of clinical data is unstructured.

How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did

Data Today

- Ubiquitous
- The Internet of Things
- Privacy
- Social Media
- eCommerce
Now What?
The Evolving Role of NI
This is STILL our Scope!!!

Nelson’s: Data to Wisdom Continuum

Increasing Complexity

- **Data**
  - Naming, collecting, organizing

- **Information**
  - Organizing, interpreting

- **Knowledge**
  - Interpreting, integrating understanding

- **Wisdom**
  - Understanding, applying, applying with compassion

Increasing Interactions and Interrelationships
“It may seem a strange principle to enunciate as the very first requirement in a hospital that it should do the sick no harm.”

Florence Nightingale
Dr. Codman’s “End Result System” began the medical outcomes movement in the US and led to the creation of the Joint Commission.
Quality and P4P

Graph 5: Share of Hospital Payment at Risk Under CMS Quality Incentive and Penalty Programs (%)
Our Team is RIPE!!

- Having the right team assembled is essential. Demonstrating value requires a team approach inclusive of Research, Informatics, Patient/Practice, Education.
A Framework for Demonstrating VALUE

- Research
- Informatics
- Value
- Patient & Practice
- Education
Similar to the SDLC, the Technology Enabled Quality Improvement methodology guides quality initiatives that utilize enabling technologies.
Our Methodology

- Evidence Based
- Research Scientist part of every TEQI
- Literature Review
- Contribution to research
- Collaboration
The Innovation Cycle

1. Observation
2. Ideation
3. Rapid Prototyping
4. User Feedback
5. Iteration
6. Implementation

Innovation Cycle
Innovation – *can be new ways of using what we already have*
The TEQI Methodology

- Research
- Innovation Cycle
- Pilot
- Deploy
- Evaluate & Contribute

- Pilot and Learn
- Deploy
- Evaluate
- Contribute

P.D.S.A
TEQI Guiding Principles

• The Agency for Healthcare Quality and Research defines the six domains of healthcare quality as care that is: Safe, Timely, Effective, Efficient, Equitable and Patient Centered. “STEEEEP”

• TEQI adds an additional “E” for Evidence-based and is addressed as follows:

<table>
<thead>
<tr>
<th>Domain</th>
<th>TEQI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe</td>
<td>Literature review</td>
</tr>
<tr>
<td>Timely</td>
<td>LEAN</td>
</tr>
<tr>
<td>Effective</td>
<td>Evaluation (Measured Outcomes)</td>
</tr>
<tr>
<td>Efficient</td>
<td>LEAN</td>
</tr>
<tr>
<td>Equitable</td>
<td>All Patients/All Settings</td>
</tr>
<tr>
<td>Evidence based</td>
<td>Research focus</td>
</tr>
<tr>
<td>Patient Centered</td>
<td>RIPE Team – “P” is for patient and practice</td>
</tr>
</tbody>
</table>
What is LEAN?

• **Lean** is a set of operating philosophies and methods that help create a maximum value for patients by reducing waste and waits.

• The approach was originally derived from the Toyota car company production line system: a continuous process improvement system comprising of structured inventory management, waste reduction and quality improvement techniques.

• Lean utilizes a continuous learning cycle that is driven by the ‘true’ experts in the processes of health care, being the patients/families, health care providers and support staff.
Lean: Eliminating Waste

**Time**
Waiting for people or services to be provided. Time when processes, people or equipment are idle.

**Defects**
Waste related to costs for inspection of defects in materials and processes, customer complaints and repairs.

**Processing**
Unnecessary processes and operations. Traditionally accepted as necessary.

**Motion**
Unnecessary movement or movement that does not add value. Movement that is done too quickly or slowly.

**Inventory**
Maintaining excessive amounts of supplies, materials, or information for any length of time. Having more on hand than what is needed and used.

**Transportation**
Conveying, transferring, picking up, setting down, piling up and otherwise moving unnecessary items.

**Overproduction**
Producing what is unnecessary, when it is unnecessary, and in unnecessary amounts.
Lean: Categories of Waste

<table>
<thead>
<tr>
<th>Waste</th>
<th>Healthcare Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Defect</strong></td>
<td>Time spent looking for an item missing from a surgical case cart.</td>
</tr>
<tr>
<td><strong>Over-production</strong></td>
<td>Performance of unnecessary diagnostic procedures.</td>
</tr>
<tr>
<td><strong>Transportation</strong></td>
<td>Unnecessarily moving patients, specimens or materials throughout a system</td>
</tr>
<tr>
<td><strong>Waiting</strong></td>
<td>Patients waiting for an appointment</td>
</tr>
<tr>
<td><strong>Inventory</strong></td>
<td>Letting supplies expire and then disposing of them</td>
</tr>
<tr>
<td><strong>Motion</strong></td>
<td>Employees may walk miles per day due to a poor hospital layout,</td>
</tr>
<tr>
<td><strong>Over-processing</strong></td>
<td>extra data stamps put onto forms, but that data never being used. Asking patients for same data multiple times.</td>
</tr>
<tr>
<td><strong>Human potential</strong></td>
<td>Employees are not engaged, heard or supported. Also, underutilizing or mis-utilizing employees.</td>
</tr>
</tbody>
</table>
• The PDSA – Plan, Do, Study, Act methodology is used with TEQI projects.
"Code Blue !!"

400 to 54

The theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.

Google
On The Horizon: Alexa and Children’s Boston
“Computer algorithm could aid in early detection of life-threatening sepsis”

- TREWS – Targeted, Real-time, Early Warning System

- Science Translational Medicine, August, 2015

- Combines 27 factors to assess patient risk

- Henry, Hager, Pronovost, Saria
Data Visualization

<table>
<thead>
<tr>
<th>Patient</th>
<th>Room</th>
<th>Flu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 1</td>
<td>5W-12</td>
<td>✓</td>
</tr>
<tr>
<td>Patient 2</td>
<td>5W-08</td>
<td>☻</td>
</tr>
<tr>
<td>Patient 3</td>
<td>5W-01</td>
<td>✓</td>
</tr>
<tr>
<td>Patient 4</td>
<td>5W-04</td>
<td>✓</td>
</tr>
</tbody>
</table>

2015-2016 Performance Period

69% 98%

2016-2017*
# Change Theory

<table>
<thead>
<tr>
<th>Need for Change</th>
<th>Shared Vision</th>
<th>Leadership Commitment</th>
<th>Employee Involvement/Commitment</th>
<th>Integrated Organizational Changes</th>
<th>Performance Measures</th>
<th>Lasting Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>¬</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>No Action</td>
</tr>
<tr>
<td>✓</td>
<td>¬</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Fast Start that Fizzles</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>¬</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Anxiety and Frustration</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>¬</td>
<td>✓</td>
<td>✓</td>
<td>Strong Resistance</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>¬</td>
<td>✓</td>
<td>“Silo” View</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>¬</td>
<td>No Measurable Results</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>LASTING CHANGE</td>
</tr>
</tbody>
</table>
“It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change.”

~Charles Darwin, 1809
Florence Nightingale

“The real heroes are those who find a way to improve things around them through the course of their daily lives.

In the nursing industry, there are many heroes who leave fine imprints of positive change because they deliver exceptional care to patients than what’s expected of them.

Keep doing whatever you’re doing and you could be one of them.”
Thank You and Questions !!

Mark Sugrue, MSN, RN-BC, FHIMSS, CPHIMS
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Resources

- New England Nursing Informatics Consortium
  - www.nenic.org

- HIMSS – Health Information Management Systems Society
  - www.himss.org

- Alliance for Nursing Informatics
  - www.allianceni.org

- ANIA-CARING
  - www.ania-caring.org