Nursing Solutions for Common Health IT Challenges

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Acknowledgement: Contribution by TNA/TONE HIT Committee members

TNA = Texas Nurses Association
TONE = Texas Organization of Nurse Executives
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TNA/TONE Health IT Committee

Original Task Force Charge* was to:

- Determine implications of health care informatics for nursing practice and education in Texas
- Include nationally-based Technology Informatics Guiding Education Reform (TIGER) initiative

TIGER Vision: To enable nurses and inter-professional colleagues to use informatics and emerging technologies to make healthcare safer, more effective, efficient, patient-centered, timely and equitable by interweaving evidence and technology seamlessly into practice, education and research fostering a learning healthcare system.

Why Does HIT Matter Deep in the Heart of Texas?

Environmental Forces:
- Health Care Reform/ARRA
- Advanced Practice Nurse Roles
- EHR Incentives
- IOM/RWJF Report Advancing Health Care
- Informatics Nurse Standards by ANA

CNE for Practicing Nurses
Educational Content Dissemination
Awareness Campaign
Nursing HIT Curriculum Development

Embrace the Technology
Preserve the Art
For 300,000 Texas Nurses

Benchmark Reports on Progress
Involving Constituents
Advisory Committee: Practice, Administration, Education and Vendors/Suppliers

T.I.G.E.R Phase III Partnership
HIT Committee Membership

Composed of TNA and TONE Members from practice and academia

Task Force Members
– Nancy Crider*
– Mary Anne Hanley
– Susan McBride
– Molly McNamara
– Mary Beth Mitchell
– Elizabeth Sjoberg
– Mari Tietze*

Texas Nurses Assoc.
– Ellarene Sanders**
– Joyce Cunningham
– Laura Lerma

* = Co-chairs  ** = Interim Executive Director, TNA
State-wide Priorities for 2013

CNE Programs
3 Advanced Webinars
1 Face-to-Face

Survey of Nurses’ Experience Using their EHRs*

Packaged Nurse Informatics Content with Support of Faculty for Deployment

Communication/Networking Sub-committee

TIGER III Initiative Content/Collaboration

* Smith et al. (2011). Developing and testing a clinical information system evaluation tool: Prioritizing modifications through end-user input. *Journal of Nursing Administration, 41*(6), 252 – 258.
IOM/RWJF HIT-related Recommendations

Content from Report

• Given the nature of patient data collection, nurses will be integral to proper collection of meaningful use data.

• Shifts in time and place of care have significant implications for nursing suggesting that nursing may be delivered remotely—as are EHRs, CPOE systems, lab results, imaging systems, and pharmacies that are linked in the exchange networks.

• HIT will fundamentally change the way nurses plan, deliver, document and review clinical care.

• HIT will refocus nursing on “high touch” tasks that these technologies cannot readily or appropriately accomplish.

• HIT will lower cost and improve efficiency, effectiveness and quality of care.

• Care will be provided in “an interoperable digital commons” requiring more effective multidisciplinary teams. (National Academy Sciences, 2010, p. 3-45).

How Applied via Committee

• Meaningful use content via CNE, actual exercise in F2F., publications, school of nursing curriculum

• Remote and health information exchange content via CNE, actual exercise in F2F., publications, school of nursing curriculum

• Innovative models of care via CNE, actual exercise in F2F., publications, school of nursing curriculum

• Collaborative role of the nurse in informatics via CNE, actual exercise in F2F., publications, school of nursing curriculum.

• HIT safety and quality content via CNE, actual exercise in F2F., publications, school of nursing curriculum

• Interprofessional approach to HIT deployment content via CNE, actual exercise in face-to-face, publications, school of nursing curriculum.

Introduction

TIGER Initiative: What’s in it for Texas

- Use of basic informatics competencies in educational materials
- Virtual Learning Environment (VLE) access to content
- Mapping of TIGER content to curriculum-based essentials
- Recognition at national conferences and publications

http://www.thetigerinitiative.org/virtuallearning.aspx
HIT Committee, Communication Sub-committee: Networking

HOW TO GET AND STAY CONNECTED IN TEXAS

1. LinkedIn site – search on “groups” for DFW Nursing Informatics Community, and join
2. eList -- email MaryBethMitchell@TexasHealth.org
3. Plan of events – frequent educational/networking sessions
4. TNA pilot blog/email – TNA sponsored blog/twitter/email in development
Description and Objectives

Description: Depicts the nurses role and associated competencies/education to optimally manage the use of health information technology (IT) for patient care delivery challenges and the solutions needed to achieve the associated value-based care delivery.

Objectives:

1. Identify trends for nursing informatics roles and how they align with health care reform [Mari]

2. Describe opportunities for nurse informaticists to impact solutions in various practice settings [Mari, Donna]

3. List three areas of health IT care delivery commonly impacted by nursing informatics [Donna]

4. Discuss how an interprofessional approach can optimize solutions to common health IT challenges [Donna, Mari]
Objective 1:
Identify trends for nursing informatics roles and how they align with health care reform
Nursing Informatics is Nursing!

- NI is was recognized as a specialty by the ANA in 1992
  - 1st Scope and Standards of Nursing Informatics Practice published

- Meets Panniers and Gassert’s (1996) attributes of a specialty in nursing
  - A differentiated practice
  - A defined research program
  - Organizational representation
  - Educational programs
  - A credentialing mechanism

Organizing Framework for Clinical Information Systems w/ Nursing Education

Data and Information about Nursing Practice

Clinical Knowledge

System Utilization

Technology Adoption

Information System

Human Factors

Clinical Knowledge

Professional Nursing Practice

Technology

Nursing/Healthcare Informatics Network

Policy/Regulations/Standards


Obj 1: Role trends and reform
Nursing Education Healthcare Informatics Model (NEHI Model)

Obj 1: Role trends and reform

Nursing Informatics Certification by ANCC*

- Standard I – Problem Identification
- Standard II – Alternative Identification
- Standard III – Develop Solution
- Standard IV – Implementation
- Standard V – Evaluation

Other Programs Under Consideration:**
- Post-master’s certification
- Master’s Degree in Nursing/Clinical Informatics
- Health IT Professional articulation options

* American Nurses’ Credentialing Center

** Stay informed via the TNA/TONE eList
Successful Automation

Successful implementation of Information Systems requires:

- Well designed systems that support Nursing Process within the culture of an organization and/or specific care providers
- Acceptance & integration of information systems into the regular workflow of nursing process & patient care
- Resources that can support the above

Source: http://www.himss.org/handouts/N1101.pdf
HITECH: Catalyst for Transformation

Pre 2009
A system plagued by inefficiencies

2009
EHR Incentive Program and 60 Regional Extension Centers

2014
Widespread adoption and meaningful use of EHRs

Three Areas of Expertise Critical to Success of our National Agenda on HIT

• Patient Safety and Risk Management Specialists
• Quality Improvement Specialists
• Nursing/clinical Informaticists
Resulting in Improved Quality, Safety and Efficiency: *What the HITECH Act is really all about …*

- Better Communication and care coordination
- Safer Treatment via e-Prescribing
- Faster Delivery of information and results
- More efficient Coding and billing

Books, Studies and Products

Obj 1: Role trends and reform

See Appendix for Agency for Healthcare Research Hazard reporting
Definition of Unintended Consequences of Health IT

- Events that are neither anticipated nor the specific goals of the associated [CPOE] computer project implementation [Sittig (2007). p. 30].
- Includes both undesirable as well as desirable, positive, and beneficial consequences [Sittig. (2007), p. 30]
- Major categories of unintended consequences identified

Unintended Consequences Categories*

- More/new work for clinicians
- Workflow issues
- Never-ending system demands
- Paper persistence
- Changes in communication patterns
- Emotions
- New kinds of errors
- Changes in power structure
- Overdependence on technology

Sittig and Ash. (2007). *Clinical information systems: Overcoming adverse consequences.* Boston: Jones and Bartlett. (p. 32)
Different Views of How IT Works

Interfaced.

Integrated.

2013 Innovative NI Activity

Source: Jim Turley, PhD, RN, University of Texas Houston School of Biomedical Informatics, Gulf Coast Regional Extension Center
Objective 2:
Describe opportunities for nurse informaticists to impact solutions in various practice settings
TIGER Community: Recommendation

An example of recommendations for practitioners:

- The requirements process should be owned by clinicians, not the information technology (IT) department or the vendor.
- Complete a workflow analysis for each user/department touching an electronic health record.

### 2011 NI Workforce Survey
Top Three Job Responsibilities

<table>
<thead>
<tr>
<th>Role</th>
<th>2011 Results</th>
<th>2007 Results</th>
<th>2004 Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems Implementation</td>
<td>57%</td>
<td>45%</td>
<td>53%</td>
</tr>
<tr>
<td>Systems Development</td>
<td>67%</td>
<td>53%</td>
<td>N/A</td>
</tr>
<tr>
<td>Quality Initiative</td>
<td>25%</td>
<td>21%</td>
<td>32%</td>
</tr>
<tr>
<td>Liaison</td>
<td>32%</td>
<td>32%</td>
<td>32%</td>
</tr>
<tr>
<td>Strategic Planning</td>
<td>15%</td>
<td>16%</td>
<td>15%</td>
</tr>
<tr>
<td>Informatics Education</td>
<td>23%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>Vendor Communication</td>
<td>13%</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>Nursing Education</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

The complexity of modern medicine exceeds the inherent limitations of the unaided human mind.’
David M. Eddy MD, Ph.D.

If all clinicians are informaticians, how do we integrate bedside clinicians into the IS product life cycle phases?
Roles of nurses & clinicians

• Processes and workflow that support safe delivery of care

• Advocacy for tools in the EHR and clinical systems that support clinicians

• Development of facility based roles to provide a feedback loop—“voice of the clinician”
  • Informatics teams
  • IRN-Informatics Resource Nurses
  • Director of Informatics
  • IRP-Informatics Resource Provider
  • IRx-Informatics Pharmacy Resource

• Development of roles & skill sets through education, application and networking

• Emerging Informatics Nursing Roles
  • Acute Care
  • Pt. Safety/Quality
  • Ambulatory
  • Rehab
  • Rural
Objective 3:
List three areas of health IT care delivery commonly impacted by nursing informatics
Health IT Care Delivery-Nursing Informatics

• **Clinical Documentation**
  – IRN’s and other Informatics teams members participate in all life cycle phase (design, build, testing, support at implementation, evaluate)
  – “Shadow chart “everything
  – Workflow analysis and impact

• **Barcode Medication Administration**
  – Reminders built into system (INR level before
  – Alerts (one pill vs. two pills)
  – Usability Testing (scanners and alerts)

• **Clinical Decision Support tools-Sepsis Alert**
  – % change in versus lactate level, does patient need Sepsis screen?

See Appendix for information on alert fatigue and “click-to-information ratio”
The Baylor Journey-Implementation of EHR

- The EMR is a very complicated technology, consisting of millions of lines of code typically authored by multiple programmers (Ash, Berg, and Coiera 2004).
- Many functions are designed by people who do not know or fully appreciate the complex interaction of the human–computer interface and the consequences of designs that may, in hindsight, have impaired patient safety.
- “Wake-up call” was clinician dissatisfaction with EHR, high numbers of change requests, results of evaluation (Harrington, Porch, Acosta & Wilkens).


How do you Design?

Some companies design by political process...

I read a book on usability once.

Some companies use intuition...

Some let the users decide...

Do you want defaults?

Don't know...

But the best use a systematic process based on research and best usability practices.

cool!
Implementation of Electronic Health Record System: Roadmap for Employing Human Factors

**Structure**
- Governance on human factors (e.g., Recommendation Workgroup)
- Guiding Principles for Safe Design and Operation
- Education program (e.g., Usability curriculum)
- Learning performance goals
- Talent (e.g., human factors engineers)
- Style guide
- Design practice guide
- Reference materials
- Prototyping and testing capabilities

**Process**
- Continued discussion on patient safety
- Periodic review of education needs and opportunity
- Periodic review of guides/references
- On-boarding process
- BLN modules
- Journal clubs
- Facilitated discussions
- Active use of guides
- Audit on use of guides and references
- Usability testing in life-cycle
- Pre-release check-list
- Evidence-based design studies

**Outcome**
- Safety culture of implementation teams
- User satisfaction
- Patient satisfaction
- STEEEP measures
- Time studies
- Usage monitoring
- Performance of clinical decision support (e.g., compliance to renal dosing, drug-drug interaction).
Initial value of Human Factors Education

Human Factors Education Curriculum* was designed to;

- Supplement on-boarding process for IS and Informatics team members
- Develop education sessions for Informatics Resource Nurses, Council Representatives, physician informatics leaders, and others participating in user center design sessions
- Develop and implement an executive-focused course
- Develop one BHCS Standard Style guide containing Human Factors principles & practices

*Planning and approach completed with Dr. Jiajie Zhang, University of Texas at Houston-BioMedical Informatics Department.
Initial value of Human Factors Education (cont.)

- Change processes to enhance user-centric design that will include;
- Usability principles and concepts integrated into system life cycle
- Employ strategies compatible with current Baylor culture/organizational structure
- To promote evidence-based design, compliance with standards, and foster a culture of learning

See Appendix for further Continuation of the Usability & Implementation Journey

*Planning and approach completed with Dr. Jiajie Zhang, University of Texas at Houston-BioMedical Informatics Department.
Resources to Support Development of Informatics Roles

- ANIA-American Nursing Informatics Association: https://www.ania.org/
  Find your local chapter for networking.
- AMIA-American Medical Informatics Association and 10x10 Courses:
  http://www.amia.org/education/10x10-courses
- Health IT Workforce Curriculum Components; National Training and Dissemination Center: http://www.onc-ntdc.org/
- LinkedIn – www.linkedin.com Join the DFW Nursing Informatics Community

See Appendix for HIMSS Healthcare Usability Model
Objective 4:
Discuss how an interprofessional approach can optimize solutions to common health IT challenges
Interprofessional Education (IPE) Enhancing Safety and Reporting [WHO]

- Example training: Health IT, PT, OT, Nutrition and Nursing [telehealth clinical environment]
- Students from different health professional groups gain an understanding of the roles and responsibilities of each member of the healthcare team.
- Experiences from the universities show that information communication technology can be used to help break down established stereotypes and promote equal partnership in patient care (p. 67).
- Strengthens patient safety mechanisms and (p. 32) and diminishes fragmentation

Interprofessional Education (IPE) Enhancing Safety and Reporting [IEC]

This report is inspired by a vision of interprofessional collaborative practice as key to the safe, high quality, accessible, patient-centered care desired by all. Report on an expert panel.*

*IPEC sponsors:
American Association of Colleges of Nursing
American Association of Colleges of Osteopathic Medicine
American Association of Colleges of Pharmacy
American Dental Education Association
Association of American Medical Colleges
Association of Schools of Public Health

Interprofessional Teamwork and IOM Core Competencies and Domains

Summary: Nursing Solutions for Common Health IT Challenges

- Create an engaged health IT workforce where nurses are clear on the importance of their role
- Work as an interprofessional team, including risk management, patient safety, quality improvement and IT
- Promote a “just” culture for reporting of events to increase error reporting. Note: estimated that 1-5% of Health IT errors are actually reported [conversation with Dr. Sittig]
- Educate key staff based on evidence-based practice for usability testing
- Employ techniques such as shadow-charting for critical processes, such as medication administration
- Remain informed of health care reform policies and associated meaningful use of EHR phases
- Stay connected through available networks of colleagues
Contacts

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Imagination is more important than knowledge
-- Albert Einstein
Hazard Reporting [AHRQ]

Hazard Reporting [AHRQ] (Overview)

There are four main categories of hazard attributes that include:

- discovery
- causation
- impact
- mitigation/corrective action

The Beta test is being conducted under the auspices of a Patient Safety Organization, with three levels of security:

- 1) a participating health care organization can enter and see information regarding the hazard it identifies;
- 2) vendors will have the ability to see hazards reported by their customers; and
- 3) health care organizations, vendors, policymakers, and researchers may request access to view aggregated, de-identified reports of hazard attributes.
Hazard Reporting [AHRQ] (Stakeholders)

Individual CDOs

- Characterize, manage and understand the variety, frequency, and impacts

Organizations using the same applications (user groups) sample = 7

- Understand the variety, frequency, and impacts of hazards associated with the applications and combinations of applications they share.
- Maintain vendor confidentiality outside the user community.

Health IT vendors

- Understand the variety, frequency, and impacts of hazards potentially associated with their software applications

Policymakers

- Aggregate and analyze health IT hazards as early as one element of a National program of health IT safety.
ALERT FATIGUE
CLICK –TO-INFORMATION RATIO
"Alarm fatigue" blamed in hospital deaths

February 19, 2011 10:26 AM
(CBS News) A Boston Globe investigation has uncovered a dangerous hospital trend that could put patients at risk.

The newspaper says more than 200 deaths nationwide over the past five years have been associated with problems with patient monitor alarms. In many of those cases, it's believed something called "alarm fatigue" is to blame.

"Alarm fatigue" refers to the response - or lack of it - of nurses to more than a dozen types of alarms that can sound hundreds of times a day - and many of those calls are false alarms.

The result? Nurses become desensitized to distress calls, and don't react with enough urgency - or at all - when a real emergency happens.

Guide to Reducing Unintended Consequences of Electronic Health Records

Example 15: Responding to Alert Fatigue

Issues Encountered

EHR systems often include decision support functionalities such as drug-drug interaction, drug-dose, drug-lab, and contraindication alerting. Several studies have identified "alert fatigue" (choosing to ignore alerts) as a common condition amongst clinicians using EHRs with decision support.

Finding a Solution

A review of the relevant research literature found that the majority of alerts are overridden. Multiple remediation options are available. The first option would be to deactivate the alerts entirely. A more measured approach might be to convene a panel of local physicians to determine which alerts should be turned on. Perhaps the most successful approach identified in the literature is implementing tiered alerts (e.g., minor, moderate, severe). Shah and colleagues found that this kind of approach significantly increased the acceptance rate of decision support alerts.

http://www.ucguide.org/appendix/case-examples/ex15.html
Guide to Reducing Unintended Consequences of Electronic Health Records (cont.)

Example 15: Responding to Alert Fatigue

Lessons Learned

- Interruptive decision support alerts can be a major source of user frustration and system inefficiency.
- Careful consideration should be given to the type and frequency of alerts that are included in decision support systems.


http://www.ucguide.org/appendix/case-examples/ex15.html
Click-to-Information Ratio

• “The problem with EMR data is that there is so much of it.”
• "You really have to know where to look and know where to find things. In healthcare, we have literally seconds sometimes to assess the situation and make a decision for patients."
• Extensive click-to-information ratio, can be associated with patient morbidity, poor outcomes and even death.
• Three years later . . . “SmartRoom as the app for the EMR.”
  – Identifies healthcare workers, who wear small ultrasound tags, as they walk into a patient's room, displays the person's identity and role on a wall-mounted monitor visible to patients
  – automatically pulls relevant, real-time patient information from the EMR and other clinical systems, including pharmacy and lab services.

Tamra Minnier, MSN, RN, FACHE
Chief Quality Officer
University of Pittsburgh Medical Center

http://www.healthleadersmedia.com/content/MAG-257392/Patient-Rooms-Get-Smart
Continuation of the Usability & Implementation Journey

- Understanding that design and build of the EHR is a science
  - EHR Satisfaction Survey of Nursing and Pharmacist, September 2011. Tool located on HIMSS site
  - Studies of Nursing EHR Documentation time and identified pain points
  - Development and application of informatics framework to prioritized change request
  - Integration of usability evaluation in barcoding medication testing
  - Monthly Human factors journal club
    - Usability competence with IRN’s and other Informatics leaders
    - Annotated bibliography
    - IRN Orientation-core competency rounding and shadow-charting
- is different depending on maturity
HIMSS Healthcare Usability Model