Nursing I.T. Trends

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CEO, The Quammen Group
Nursing Informatics (NI) is the specialty that integrates nursing science, computer science, and information science to manage and communicate data, information, and knowledge in nursing practice. Nursing informatics facilitates the integration of data and knowledge to support patients, nurses, and other providers in their decision-making in all roles and settings. This support is accomplished through the use of information structures, information processes and information technology.
The goal of Nursing Informatics is to improve the health of populations, communities, families, and individuals by optimizing information management and communication. This includes the use of technology in the direct provision of care, in establishing effective administrative systems, in managing and delivering education experiences, in supporting life-long learning, and in supporting nursing research.

Scope of Standards of Nursing Informatics Practice - American Nurses Association 2001
Nursing Informatics – Standards of Practice

- Organized around a general problem-solving framework that closely resembles the familiar nursing process of:
  - Assessment
  - Diagnosis
  - Identification of Outcomes
  - Planning
  - Implementation
  - Evaluation

- Supports all facets of Informatics Practice, including those without technology

*Scope of Standards of Nursing Informatics Practice - American Nurses Association 2001*
An informatics solution may encompass technology and non-technology products such as:

- Developing a database
- Purchasing a new computer application
- Creating nursing vocabulary
- Design informatics curricula
- Creating a spreadsheet
- Tailoring an application to a particular environment
- Designing a research study to describe required informatics competencies
- Describing information flow in a process redesign
- Creating a structure for information presentation

Scope of Standards of Nursing Informatics Practice - American Nurses Association 2001
For three decades or more, nurses have held informatics roles and been key stakeholders in developing, implementing, and evaluating informatics solutions. Although implementing informatics solutions continues to be very important, more recently informatics nurse specialists have worked to develop and refine nursing’s language, implement telehealth systems, establish NI educational programs and expand the focus.

Scope of Standards of Nursing Informatics Practice - American Nurses Association 2001
Ubiquitous computing is becoming a reality and the continued innovation and miniaturization of technology is evident. Consequently partnering between nurses in all specialties and new technologies is becoming imperative.

Technological innovations are challenging many traditional processes. Telecommunications technologies are one set of tools used in nursing practice.

Core competencies across informatics specialties should be identified in the near future. The distinctions among informatics specialties will continue to blur.

The speed of information transfer and the increasing availability of communication technologies will impact nurses and informatics nurse specialists in the future, making nursing practice and NI, in particular, more international in practices with world-wide standards, competencies and curricula.

Scope of Standards of Nursing Informatics Practice - American Nurses Association 2001
Nursing IT is a topic that **transcends** the collection, storage, reporting, and transmittal of data.

Nursing IT is a broad, collaborative and complex topic that **encompasses**...
Successful Use of IT in Nursing

People
- Individual Motivation
- Fear of Computerization
- Personnel Costs
- Organizational Culture
- Big Picture
- Integration vs. Functionality

Compromise

Business Practice
- Work Flows
- Process vs. Task Orientation
- Clear Vision and Priorities
- Business Plan
- Data Ownership
- Patience and Time

Compromise

Systems
- Standards Compliance
- Interoperability
- Data Redundancy
- Vendor Product Strategies
- Best of Breed vs. Integrated

Compromise
Nursing Information Technology

Encompasses much more than the relationship between the physical parts of the system.

Health Outcomes
Cost

IT success is measured by the user and validated in the meaningful application of data.

What’s in it for me?
What’s in it for my patient?
So, how are we doing?
Slow but Steady Progress…

- Patient documentation
  - Timely information
  - What the clinician needs when they need it
  - More information

- Secure access to clinical data in more places and in more ways
  - In the office, at home, on a variety of devices

- Clinician workflow efficiencies and productivity gains

- Administrative, financial and clinical decision-making
  - Concurrent
  - Retrospective
  - Trending
Nursing – IT Trends

- Mature and Ubiquitous Technology Solutions
- Mid-Stage Technology Solutions
- Emerging Technology Solutions
Mature and Ubiquitous Technology Solutions

- Order Management & Communication
- Clinical Repositories
- Departmental Systems (LAB, RAD, etc.)
- PACS
- Online Electronic Bed Management Systems
- Departmental Scheduling
- Staff Scheduling
- Intranet/Internet Based Reference Materials (Orders, P&P, Protocols, Drug Monographs)
- Phones, Pagers, In-house Communication Devices
- Wide Variety of Fixed & Mobile Devices
Mid-Stage Technology Solutions

- Online and Integrated Electronic Patient Documentation
- Integrated Hemodynamic Monitors (Vitals Signs) with EMR
- Hand-held Devices for Data Collection & Input
- Online Fully Integrated Medication Administration Record
- Online and Integrated Rules and Alerts
- CPOE – Computerized Provider Order Entry
- Bar Code Technology
- Access and Security Technology
- Sophisticated Implementation Methodologies
- Organization of Nursing Practice through Technology
  - Time and Motion Templates
  - Nomenclature/Data Standardization Tools
  - Care Plan Standardization and Tool Sets
Emerging Technology Solutions

- National Patient Databases for comprehensive patient record across disparate providers
- Patient Health Cards – contain all medical records and information
- Advanced Biometric Access and Security functionality
- Voice recognition within electronic medical records
- Hands free communication tools
- RFID
Mature and Ubiquitous Technology Solutions

- Clinical Systems
  - Order Management & Communication
  - Clinical Repositories
  - Departmental Systems
  - PACS
Mature and Ubiquitous Technology Solutions

- **Enterprise Systems**
  - Online Electronic Bed Management Systems
    - Nurse assignments are no longer hand written
    - Determine the real-time census of units
    - Reports available to track lengths of stay
    - Monitor delays in patient movement
    - Determine bed availability quickly
    - Spend less time negotiating on the telephone
  - **Departmental Scheduling Systems**
    - Deployed as standalone or in centralized models
Mature and Ubiquitous Technology Solutions

- Administrative & General Workflow
  - Staff Scheduling
    - Allows healthcare facilities to create templates for the various skills and skill mixes that exist across their units and facilities
    - Using this template a computerized system optimizes staffing based on identified and known constraints
    - Facilitates identification of staff preferences in mind
    - Logic identifies when a skill mix is off
    - Logic identifies when a nurse is being asked to go to an area that she/he is not trained for
    - Time required for schedule creation has decreased significantly
    - Staff satisfaction has improved
  - Intranet Based Reference Materials (Orders, P&P, Protocols, Drug Monographs)
  - Phones, Pagers, In-house Communication Devices
Wide Variety of Mobile Devices
- Designed to augment clinical workflow needs
- Can be personalized to the care giver and specific documentation or data entry needs
- Laptops
- PDAs
- Notebooks
- COWs (Computers on Wheels)
- Many Others

...is about getting the right information to the right person at the right time.
# The Right Tool for the Job

## Clinical Solution Assessment Document

<table>
<thead>
<tr>
<th>Hardware Device</th>
<th>Cost</th>
<th>Technology</th>
<th>Access</th>
<th>User Interface</th>
<th>Average Total (excluding cost)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Wireless</td>
<td>Speed</td>
<td>Security</td>
<td>MIS Support</td>
</tr>
<tr>
<td>Laptop</td>
<td>$$$</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Handheld</td>
<td>$</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PC</td>
<td>$$</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Legend:
1=Good
2=Marginal
3=Poor
Mid-Stage Technology Solutions

Achieving the Right Balance

Patient Safety
Workflow
Quality Patient Care

Supporting Clinicians Through Automation
Online and Integrated Electronic Patient Documentation

- Online documentation of vital signs, intake and output, nursing notes, and assessments
- Integrated with online MAR for documenting of pain response, vital sign response, and lab values associated with medications
- Integrated with physician, ancillary, and other care giver documentation
Clinician’s Access to Paper Record

- Attending Physician
- Nursing
- Consulting Physician(s)
- Respiratory Care
- Case Management
- Nutritional Services
- Risk Management
- IV Team
- Patient Financial Services
- Infection Control
- Wound Management
- Pastoral Care
- Clinical Process Improvement
- Cardiology
- PT/OT/Speech
- Others

BARRIERS
- Record must be on unit
- All clinicians and support personnel must walk to location of chart
- One person can access the chart at a time
- Legibility of chart input
- Timely filing of data results into chart
- Finding clipboard for most current information
- MAR at different location
- Redundant information
Clinician’s Access to Online Record

- Attending Physician
- Nursing
- Consulting Physician(s)
- Respiratory Care
- Case Management
- Nutritional Services
- Risk Management
- IV Team
- Patient Financial Services
- Infection Control
- Wound Management
- Pastoral Care
- Clinical Process Improvement
- Cardiology
- PT/OT/Speech
- Others

ELECTRONIC PATIENT DATA

BARRIERS:
- Systems Availability
- User Acceptance
Mid-Stage Technology Solutions

- Integrated Hemodynamic Monitors (Vital Signs) with EMR
  - Vital signs are automatically updated to the patient EMR
  - Eliminates paper documentation and accurately captures patient information at the point of care
  - Devices are fixed in the patient room or mobile on COWs (Computers on Wheels)
Mid-Stage Technology Solutions

- Hand-held Devices for Data Collection & Input
  - Assist with obtaining, verifying, and communicating data
  - Cardiology, Transplant, and other clinically significant data can be entered directly online
  - Eliminates the need for bulky data collection sheets
  - Enhances the ability for version control of data entry documents
Mid-Stage Technology Solutions

- Online Fully Integrated Medication Administration Record
  - Significant time reduction associated to documenting medications
  - Significant time reduction associated with transcription of medications to paper MAR
  - Decreased transcription errors
  - Increased patient safety
Medication Administration Record

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose (mg)</th>
<th>Route</th>
<th>Frequency</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novolin R U-130</td>
<td>1200</td>
<td>IV</td>
<td>Daily</td>
<td>03/04</td>
<td>03/06</td>
</tr>
</tbody>
</table>

**Before**

**After**
Mid-Stage Technology Solutions

- Online and Integrated Rules and Alerts (Workflow)
  - Drug-allergy alerts based on order entry functionality
  - Drug-drug interaction alerts
  - Alerts for abnormal lab values and vital signs
  - Alerts for new orders
  - Alerts for order renewals
  - Alerts for scheduled patient events
Mid-Stage Technology Solutions

- CPOE – Computerized Provider Order Entry
  - Nurses no longer struggle to read physician handwriting
  - Reduces verbal orders
  - All providers can enter orders directly online
    - Integrated rules and alerts
    - Integrated allergy check
  - Decreases chances for transcription error
  - Reduces delays in patient care
Bar Code Technology

- Barcodes on patient bands and medication packaging helps to double check that the right medication is being given to the right patient at the right time
- System alerts the nurse immediately if any inconsistencies or potential problems exist
- Internal back-up systems are in place to back-up information regularly so a MAR can be printed in the event of system downtime
- Integration with electronic MAR and documentation systems becoming more common place
Mid-Stage Technology Solutions

- Access and Security Technology
  - Single Sign-On
  - Biometric
Mid-Stage Technology Solutions

- Sophisticated Implementation Methodologies
  - Sophisticated planning and implementation methodologies take the guess work out of project management
  - Include workflow, communication, risk mitigation, system design and analysis, as well as overall task management activities
  - Tightly integrated financial management tools to ensure projects stay on track and in budget
Mid-Stage Technology Solutions

- Organization of Nursing Practice through Technology
  - Time and Motion Templates
  - Nomenclature/Data Standardization Tools
  - Care Plan Standardization and Tools Sets
Emerging Technology Solutions

- National Patient Databases for comprehensive patient record across disparate providers
- Patient Health Cards – contain all medical records and information (advance directives)
- Integration with retail pharmacy (home meds)
- Advanced biometric access and security functionality
- Voice recognition within electronic medical records
- Hands free communication tools
“Frankly sir, we’re tired of being on the cutting edge of technology.”
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Chief Clinical Informatics Officer  

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