National Nursing Informatics
Deep Dive Program

Integrating AACN Essentials, QSEN KSA’s and TIGER Competencies for Nursing Informatics

Part 2

Thomas R. Clancy, PhD, MBA, RN, FAAN
Clinical Professor and Assistant Dean
Faculty Practices, Partnerships and Professional Development

January 21, 2015

University of Minnesota
School of Nursing
Driven to Discover™
Objectives: Overview

• Describe why it is important for nursing students to develop successful knowledge, skills and attitudes for information management and patient technology.

• Discuss methods of integrating professional standards for nursing informatics into program curricula aimed at prelicensure nursing students.

• Provide nursing informatics resources and tools that can be easily incorporated into existing prelicensure program curricula.
Objectives: Part 1

Part I: Aligning AACN Essentials for Information Management and Patient Care Technologies with QSEN & TIGER

• Compare and contrast how information management and patient care technology has impacted nursing in the last 35 years.
• Describe how rising complexity in healthcare is driving the need for continuous learning systems enabled by technology.
• Discuss challenges nursing school faculty face in learning and teaching information technology today.
• Identify nursing school accreditation expectations and standards for integration of information management and patient care technology in pre-licensure nursing programs.
Part 2: Supporting Safe Nursing Practice Through Patient Care Technologies and Workflow Design

• Define patient care technologies, information systems and communications devices (AACN BSN Essential – IV, Information Management and Patient Care Technologies).

• Discuss assessment of, minimum requirements for and resources available for computer literacy in prelicensure students (TIGER).

• Identify how, and provide examples of patient care technologies that enable management of information and improve patient care.

• Demonstrate exemplars of strategies and methods used by nursing faculty to teach informatics to prelicensure students.
Part 3: March 26, 2015

Improving Patient Outcomes and Safety through Electronic Health Records & Clinical Decision Support

- Navigating the electronic health record (EHR), clinical decision support, workflow design and the selection, implementation and evaluation of information technologies.
Part 4: April 22, 2015

Identifying Nursing’s Unique Contribution to Patient Outcomes Through Standardized Terminologies

• Information technology as an enabler of evidence based practice and outcomes research (standardized nursing terminologies, descriptive and predictive analytics, population management, dashboards), ethics, information security, and protected health information as they relate to regulatory requirements, confidentiality, and clients’ right to privacy
AACN Essentials For Information Management and Application For Patient Care Technology

1. Demonstrate skills in using:
   • *patient care technologies*,
   • *information systems* and
   • *communication devices* that support safe nursing practice.
Patient Care Technologies

- Computers, printers
- IV smart pumps,
- Bar coded medication management systems,
- Monitoring devices (temp, pulse, BP, ECG, respirations, PaO2)
  - Wearable technology
  - Intranet of Things

AACN Sample Content
Use of patient care technologies
AACN Information Systems

Operations Support

- Basic computer software applications (spread sheets, email, word processing, databases)

Core Systems

- Admission, discharge, transfer
- Financial systems
- Order entry system
- Ancillary systems (lab, pharmacy, radiology)
- Results reporting systems
- Documentation systems
- Administrative systems (scheduling)

Sample AACN Content

Computer skills that may include basic software, spreadsheet, and healthcare databases.
AACN Communication Devices

Communication Devices

- Smart phones,
- Hands free mobile communication devices (Vocera),
- Tablets (iPads)
- Email
- Wearable technology
- Telemedicine
Technology Informatics Guiding Education Reform (TIGER)
Informatics Competencies for Every Practicing Nurse:

**TIGER Competencies**
European Computer Driving License

**Basic Computer Competencies**
1.1 Hardware
1.2 Software
1.3 Networks
1.4 Information/communication tech.
2.1 Operating systems
2.2 File Management
2.3 Utilities
2.4 Print Management
3.1 Using the Application
7.1 The Intranet
7.2 Using the browser
7.3 Using the Web
7.4 Web outputs
TIGER: Basic Computer Competencies

Hardware

• Understand the term hardware.
• Understand what a personal computer is. Distinguish between desktop, laptop (notebook), tablet PC in terms of typical users.
• Identify common handheld portable digital devices like: personal digital assistant (PDA), mobile phone, smartphone, multimedia player and know their main features.
• Know the main parts of a computer like: central processing unit (CPU), types of memory, hard disk, common input and output devices.
• Identify common input/output ports like: USB, serial, parallel, network port, FireWire.
TIGER: Basic Computer Competencies

Software

- Understand the term software.
- Understand what an operating system is and name some common operating systems.
- Identify and know the uses of some common software applications: word processing, spreadsheet, database, presentation, e-mail, web browsing, photo editing, computer games.
- Distinguish between operating systems software and applications software.
- Know some options available for enhancing accessibility like: voice recognition software, screen reader, screen magnifier, on-screen keyboard.
What New Nurses Know

Miller et al. (2014)

Time it took nurses to become comfortable using an EHR
Basic Computer Literacy for New Students

- Type at least 30 words per minute
- Perform basic word processing functions i.e. typing,
- saving documents, opening documents, copying,
- pasting, cutting, printing, checking spelling
- Manipulate text, images, and data as needed,
- transferring them from their original locations and
- formats to a new document
- Create file folders and manage multiple files
- Create documents consistent with APA format i.e.
European Computer Driving License

Register & Create Your Very Own ECDL Profile

1. Purchase your unique candidate registration number from your local ATC. Choose from the list of modules available in your region, or certify your skills with one of our recommended ECDL Profiles: Base, Standard, or Expert.
2. Undertake the Training
3. Choose from a range of training solutions, which are available through your local ATC.
4. Take the Tests and Get ECDL Certified

Take the certification tests at the nearest test centre to you. All modules successfully completed will appear on your ECDL Profile certificate.

http://www.ecdl.com/
The Northstar Digital Literacy Project

• The Northstar Digital Literacy Project is a free on-line tutorial that defines basic skills needed to perform tasks on computers.

• https://www.digitalliteracyassessment.org/index.php
The Northstar Digital Literacy Project

1. Basic Computer
2. World Wide Web
3. Windows
4. Mac OS X
5. Email
6. Microsoft Word
7. Social Media
8. Microsoft Excel
Assessment of Computer Competencies

Module 1
Digital Literacy: Mastering the Fundamentals of Computers and Technologies

In order to access the rest of the course, you must pass the Pre-Test (70%) and the Post-Test (80%). If you do not pass the Pre-Test, with at least 70% correct, we recommend that you take some time to review the Passport Module: Learning Resources.

• By the end of this module, you should be able to:
• Demonstrate knowledge about basic computer operation.
• Differentiate between different computer hardware parts.
• Identify a variety of software applications used for productivity and patient care applicability.
• List names of major operating systems.
• Pre-Test - Tools for Managing Information: Basic Computer Competencies
Self Assessment in Moodle

Question 1
I can save files to the following locations (select all that apply)
Select one or more:
   a. Hard drive
   b. CD-ROM
   c. Network Drive
   d. Flash drive
   e. Cloud drive (such as Google Drive or DropBox)

Question 2
The following are popular internet browsers (check all that apply)
Select one or more:
   a. Internet Explorer
   b. Netscape Navigator
   c. Google Chrome
   d. Windows Explorer
   e. Safari
   f. Firefox
## Knowledge Complexity Framework

<table>
<thead>
<tr>
<th>Data</th>
<th>Obtain raw facts (numbers, text, symbols)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information</strong></td>
<td>Give meaning to data as vital signs, lab values, IV flow rates, patient names, medication (name, route, time, frequency), radiology images, provider orders, standards, guidelines.</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td>Analyze and synthesize information for values outside of normal range (vital signs, lab values, IV flow rates, medication dosage), trend lines and historical data.</td>
</tr>
<tr>
<td><strong>Meaning</strong></td>
<td>Use critical thinking to assess and act upon knowledge. Provide appropriate nursing interventions.</td>
</tr>
<tr>
<td><strong>Philosophy</strong></td>
<td>Assess and evaluate the impact of actions on the entire person. What and how are other systems (physiologic and sociologic) affected by the interventions.</td>
</tr>
<tr>
<td><strong>Wisdom</strong></td>
<td>Use knowledge, meaning and philosophy to reflect upon past experiences and recognize patterns that aid in establishing and achieving goals.</td>
</tr>
</tbody>
</table>
Exponential Growth in Complexity

Decades of rapid innovation and technological improvement have created an extraordinarily complex healthcare system. So much so that healthcare often falls short of its potential.

Typical chronic disease pt.

• 79 years old,
• Osteoporosis,
• Osteoarthritis,
• Type 2 diabetes,
• Hypertension,
• COPD,

Knowledge Complexity Framework

Cognitive Load

Complexity

Data

Information

Knowledge

Meaning

Philosophy

Wisdom
Alignment with Underpinnings of Informatics

<table>
<thead>
<tr>
<th>Look to the Past</th>
<th>Look to the Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gathering</td>
<td>Learning</td>
</tr>
<tr>
<td>Know-Nothing</td>
<td>Know-What</td>
</tr>
</tbody>
</table>

Data (numbers, symbols, facts)  
Information (data processed and organized to describe who, what, where and when)  
Knowledge (collected information, instructs how)  
Experience (knowledge gained through doing)  
Theory (a framework for explaining behavior)  
Understanding (assign meaning, explain why, apply to analysis)  
Wisdom (judgment, evaluated understanding, long-term, proper, good, right)

Extrinsic | Intrinsic
---|---
Analyzing | Deciding | Executing
Control and Efficiency | Value and Effectiveness
Doing things right | Doing the right things
# Knowledge Complexity Framework

| Data | **Digital data** can be created, reproduced and stored at a fraction of the cost of paper data.  
Digital data can be configured to be displayed in specific fields in **EHR’s or LED’s** to turn raw data into information (vital signs, medications, flow rates). |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Information (Procedural)</td>
<td>Information can be transformed into knowledge through <strong>clinical decision support</strong> alerts/reminders for values outside of normal range (vital signs, lab values, IV flow rates, medication dosage), trend lines and historical data.</td>
</tr>
<tr>
<td>Knowledge (Functional)</td>
<td>The creation of meaning from knowledge can be enabled through <strong>expert systems</strong> by predicting outcomes and recommending appropriate nursing interventions.</td>
</tr>
<tr>
<td>Meaning (Managing)</td>
<td>Assess and evaluate the impact of actions on systems with <strong>electronic dashboards and benchmarks</strong>.</td>
</tr>
<tr>
<td>Philosophy (Systems)</td>
<td>Use knowledge, meaning and philosophy to reflect upon past experiences and recognize patterns through <strong>data visualization tools</strong> that aid in monitoring outcomes for entire populations of patients with specific disease conditions.</td>
</tr>
<tr>
<td>Wisdom (Renewing)</td>
<td></td>
</tr>
</tbody>
</table>
Value of Information Technology
Clinical Decision Support

Enabler of:
• Medication dosing
• Order facilitators
• Point of care alerts
• Point of care reminders
• Information displays
CDS: IV Pumps

- **Medication dosing** - calculating and monitoring flow rates
- **Order facilitators** – programmable orders
- **Point of care alerts** – tube blockages, replace IV bag.
- **Point of care reminders** IV tubing change.
- **Information displays** - LED dashboard.
## Table 1. Examples of averted programming errors\(^a\)

<table>
<thead>
<tr>
<th>Location</th>
<th>Drug</th>
<th>Variable</th>
<th>Initial</th>
<th>Reprogrammed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical-surgical</td>
<td>Hydromorphone</td>
<td>PCA dose</td>
<td>3 mg</td>
<td>Decreased to 1 mg</td>
</tr>
<tr>
<td>Medical-surgical</td>
<td>Hydromorphone</td>
<td>Maximum limit</td>
<td>25 mg</td>
<td>Decreased to 10 mg</td>
</tr>
<tr>
<td>Medical-surgical</td>
<td>Hydromorphone</td>
<td>Continuous dose</td>
<td>30 mg</td>
<td>Decreased to 1 mg</td>
</tr>
<tr>
<td>Medical-surgical</td>
<td>Morphine</td>
<td>Loading dose</td>
<td>10 mg</td>
<td>Decreased to 4 mg</td>
</tr>
<tr>
<td>Critical care</td>
<td>Fentanyl</td>
<td>Continuous dose</td>
<td>300 (\mu)g</td>
<td>Decreased to 150 (\mu)g</td>
</tr>
<tr>
<td>Medical-surgical</td>
<td>Hydromorphone</td>
<td>Maximum limit</td>
<td>200 mg</td>
<td>Decreased to 10 mg</td>
</tr>
<tr>
<td>Medical-surgical</td>
<td>Fentanyl</td>
<td>PCA dose</td>
<td>1 (\mu)g</td>
<td>Increased to 50 (\mu)g</td>
</tr>
<tr>
<td>Critical care</td>
<td>Morphine</td>
<td>Lockout (time)</td>
<td>30 min</td>
<td>Increased to 15 min</td>
</tr>
<tr>
<td>Critical care</td>
<td>Meperidine</td>
<td>Continuous dose</td>
<td>20 mg</td>
<td>Decreased to 10 mg</td>
</tr>
</tbody>
</table>

\(^a\) Alerts are not posted until the “start” key is pressed and programming is completed. All limits are initially set up as “soft” (can be administered as override).

CDS: Bar-coded Medication Management

- **Medication dosing** support (medication pick lists, dosing calculators)
- **Order facilitators** (order sets for specific conditions based on evidence based guidelines: pneumonia, adult prosthetic hip replacement, myocardial infraction)
- **Point of care alerts** (drug to drug interactions, duplicate therapy, drug allergies, contraindications to specific conditions)
- **Point of care reminders** (immunizations, cancer screenings, fall prevention, pain management).
- **Information displays** (dashboards of relevant data)

AACN Sample Content

- Use of technology and information systems for clinical decision-making.
- Technology and information systems safeguards

http://z.umn.edu/nnideepdive
Measuring the Impact of Bar-coded Medication Administration

- The AHRQ-funded projects listed below are measuring the impact of BCMA on health care quality, safety, and efficiency.
- **Bar Coding for Patient Safety in Northern Michigan** (Randi Oehlers; Traverse City, Michigan)
- **CCHS-East Huron Hospital CPOE Project** (Barbara Moran; East Cleveland, Ohio)
- **Comprehensive IT Solution for Quality and Patient Safety** (Jim Jose; Atlanta, Georgia)
- **HIT Based Regional Medication Management Pharmacy System** (Mark Schmidt; Cloquet, Minnesota)
- **Improving Health Care Quality via IT** (Avis Hayden; Bennington, Vermont)
- **Improving Health Care through HIT in Morgan County, IN** (Deb Aders; Martinsville, Indiana)
- **Improving Patient Safety/Quality with HIT Implementation** (John Reiling; West Bend, Wisconsin)
- **Medication Management: A Closed Computerized Loop** (Mark Hetz; Grants Pass, Oregon)
- **Nursing Home IT: Optimal Medication and Care Delivery** (Susan D. Horn; Salt Lake City, Utah)
- **Project Infocare** (Peggy Esch; Bolivar, Missouri)
- **Tulare District Hospital Rural Health EMR Consortium** (David Galloway; Tulare, California)

3. Advocate for the use of new patient care technologies for safe, quality care
AACN Essential

4. Use telecommunication technologies to assist in effective communication in a variety of healthcare settings.

Telecommunications Technologies:

AACN Sample Content

- Technology for virtual care delivery and monitoring.
- Interstate practice regulations (e.g., licensure, telehealth).
- Information literacy

University of Minnesota
School of Nursing
QSEN Attitudes

Appreciate the necessity for all health professionals to seek lifelong, continuous learning of information technology skills

Knowledge
• Explain why information and technology skills are essential for safe patient care

Skills
• Seek education about how information is managed in care settings before providing care.
The Future of the Nursing Workforce: National- and State-Level Projections, 2012-2025

- Approximately 2.9 million RNs were active in the workforce in 2012.
- The number of new graduates that entered the workforce has substantially increased from approximately 68,000 individuals in 2001 to more than 150,000 in 2012 and in 2013.
- The RN supply is expected to outstrip demand by 12% between 2012 and 2025.
- While not considered in this study, emerging care delivery models, with a focus on managing health status and preventing acute health issues, will likely contribute to new growth in demand for nurses, e.g., nurses taking on new and/or expanded roles in preventive care and care coordination.

Emerging Care Delivery Models: eHealth

Cost-effective and secure use of information and communications technologies in support of health and health related fields, including health care services, health surveillance, health literature, health education, knowledge and research.

• http://www.axistelesolutions.com/satisfied-customers.html

eHealth Components

✓ **Mobile Health (mHealth):** Provision of health services and information via mobile and wireless technologies.

• **Health Information Systems (HIS):** Systems to gather, aggregate, analyze and synthesize data from multiple sources to report on health; can include information related to patient records, disease surveillance, human resources, management of commodities, financial management, service delivery and other data needed for reporting and planning purposes.

✓ **Telemedicine:** Provision of health care services at a distance; can be used for inter-professional communication, patient communication and remote consultation.

• **Distance Learning (eLearning):** Education and training in electronic form for health professionals.
Drivers of Change: Exponential Growth in Processing Speed

ASCII RED: Year 1996

- Speed: 1 TFLOP
- Size: 1625 Square Feet
- Cost: $55 Million

Play Station 3: Year 2005

- Speed: 1.8 TFLOP
- Size: DVD player
- Cost: $500

http://www.top500.org/featured/systems/asci-red-sandia-national-laboratory/
Drivers of Change: The Digitization of Everything

• Transformation from analog to digital format has massively accelerated growth in technology.

• Once created digitized data is practically free to copy & reproduce.

• One trillion sensors today!
Drivers of Change: Recombination of Technologies

Smart Phones

- Proximity sensor
- Ambient light sensor
- Accelerometer
- Magnetometer
- Gyroscopic sensor
- Camera/Video
- Voice recognition (Siri)
- Phone
- Email/Text
- Intranet
- Natural Language Processing

iPhone
Drivers of Change: Recombination of Technologies:

Google Glass

- Computer
- Camera
- Voice & video recorder
- Web browser

Mobile Health (mHealth) Explosion

- 85% of adults own a cellphone.
- 76% own a computer
- 80% have access to the Intranet
- Mobile device growth is estimated at 30% per year.
- 10 billion users by 2020

Mobile Health (mHealth)

Medical and public health practices supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices.

mHealth: New horizons for health through mobile technologies, World Health Organization, Global Observatory for eHealth series - Volume 3, 2011

http://healthinformatics.wikispaces.com/mHealth
Drivers of Change: The Digitization of Healthcare Meaningful Use

- Projections are for 90 percent of providers to have access to a fully operational electronic health records by 2019, up from 34-35 percent in 2011.
Drivers of Change: Big Data

Data takes on multiple forms:

• Structured & Unstructured text
• Audio (dictation)
• Images (PAC’s)
• Videos
• Waveforms (ECG)
• Streaming (Sensors)
The Perfect Storm: Emergence of Massive Databases (Big Data)

Top 10 Largest US Databases
1. Library of Congress
2. CIA
3. Amazon
4. YouTube
5. ChoicePoint
6. Sprint
7. Google
8. AT&T
9. NERSC
10. World Data Center for Climate

Largest Healthcare Databases
1. HCUPnet (AHRQ): on-line query system that provides free, instant access to the largest set of all-payer health care databases that are publicly available.
2. Optum Labs Data Warehouse: Largest commercial database of insurance claims data.
Drivers of Change:  
**Big Data => Expert Systems**

Extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions.

https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8&q=big+data+definition

https://www.ninr.nih.gov/newsandinformation/newsandnotes/pre-doctoral-bigdata-2014#.VN9zyfnF-Ag
Clinical Decision Support: Expert Systems

Expert systems use databases of expert knowledge and artificial intelligence to offer advice or make decisions in such areas as medical diagnosis and recommended treatment plans.

Real Time Analytics: The New Paradigm

Descriptive
Real Time Dashboards

Predictive
MEWS System
(Modified Early Warning System)

www.infosystems.com

http://www.ihi.org/resources/Pages/ImprovementStories/EarlyWarningSystemsScorecardsThatSaveLives.aspx
http://www.youtube.com/watch?v=Vgczw5d_gv4
Managing Health Status and Preventing Acute Health Issues

Care Coordination (patient centered medical homes)
- Advanced monitoring devices (diabetic pumps, pace-makers)
- Health Maintenance (smart scales, home monitoring devices)
- Population management (descriptive and predictive)

Telemedicine
- Virtual ambulatory care (protocol driven virtual home visits)
- Telehealth (patient assessment via telemonitoring equipment)
- Remote nursing units (virtual ICU’s)

Health Coaching
- Patient engagement (personal health records & health literacy)
- The quantified self movement (wearable technology & the Intranet of Things)
- Social Networks (self and family caregiver on-line support groups)

Data Science & Big Data
- Descriptive and predictive analytics
Care Coordination: Population Management

Care coordination in the primary care practice involves deliberately organizing patient care activities and sharing information among all of the participants concerned with a patient's care to achieve safer and more effective care.

Care Coordinator Role

• Care transitions
• Patient and family engagement
• Health maintenance and education
• Risk evaluation, planning, intervention and chronic disease population management
Care Coordination Partnerships

Care Coordination Course

• Develop partnerships with organizations that utilize care coordinators
• Create a care coordination course
Care Coordination Software: Diabetes

- Monitor A1c, fasting lipids, blood pressure, microalbumin and identify high risk patients
- Establish and compare national benchmarks and variations in care
- Monitor and report on key indicators for diabetes complications
- Predict high risk acute care admissions

http://www.slideshare.net/dalesanders1/disease20registries20webinar20-nov202014-tv2
Simulate New Emerging Roles

• Care Coordinator
• Health Coach
• Virtual office visits
• Virtual ICU
• Tele-health assessments
Sample Assignment 1
Information Literacy

Purpose

• The purpose of this group assignment is to explore and present a summary of the literature on a selected evidence based guideline. Investigate and recommend how health informatics or information technology could enable patients to successfully meet objectives of the guideline.

Instructions

• Perform an online literature search using university library and/or scholar.google.com to identify 3 or more scientific articles that address an informatics topic selected by your discussion group.
• Summarize the state of the science regarding this topic in a presentation (e.g. PowerPoint/VoiceThread presentation). Provide a list of references in APA style)
EVALUATING WEB RESOURCES
RESOURCES IN HEALTH SCIENCES LIBRARIES’ COLLECTION AND ON THE WEB
BIO-MEDICAL LIBRARY

AUTHORITY/SOURCE
Is it clear who is responsible for the contents of the page? Try to find out who are the authors of the Web page. Is it an organization, society, governmental site? Is it sponsored by an educational institution or is it someone's personal site? Or, is it a commercial site where someone is selling something? Do the authors of the site have any qualifications to go with the information they are presenting? Does the site present any other way of contacting the site authors -- postal address, phone numbers?

ACCURACY
Are the sources for any factual information listed so that you can verify them in another source? How well put together is the site -- does it have spelling errors, typos, etc.? Are any charts, diagrams, statistical information clearly labeled as to where the data source came from?

OBJECTIVITY/CONTENT
Is this information being provided as part of a public service? How much, if any, advertising is there on the page? Is the advertising content clearly separate from the informational content? Does the author of the page state any bias for producing the page, such as an advocacy for a particular point of view or program? 4. CURRENCY/TIMELINESS When was the last time the page itself was updated? Are there any indications on how often the informational content is updated?

STRUCTURE/ACCESS
How well designed or user-friendly is the site? If it contains images, are they useful, load quickly or merely take up space. Can it be viewed as text-only? Does it contain a “search the site” function?
Identify Evidence Based Guideline

1. HbA1c measured at appropriate interval

2. Results received & routed to designated person

3. HbA1c value compared with target for patient

4. HbA1c target achieved?
   - No
     4a. Implement improvement strategies
   - Yes
     4b. Agree to continue current care plan

5. Reinforce guidelines & appropriate follow-up

Care Factors That May Have an Impact on the Critical Pathway:
PT = Patient

**Personal Health Records and eHealth Hubs**

<table>
<thead>
<tr>
<th>Personal Health Records (PHRs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microsoft Health Vault</strong>&lt;br&gt;<a href="http://www.salvagente.co.za/ozone-saunas/microsoft-health-vault-explained/">Web Site Disclaimers</a></td>
<td>A free PHR system that integrates with multiple web sites and personal health devices.</td>
</tr>
<tr>
<td><strong>WebMD Health Manager</strong>&lt;br&gt;<a href="http://www.salvagente.co.za/ozone-saunas/microsoft-health-vault-explained/">Web Site Disclaimers</a></td>
<td>A free standalone PHR system with some options for sharing information with doctors and others.</td>
</tr>
<tr>
<td><strong>MyMediConnect</strong>&lt;br&gt;<a href="http://www.salvagente.co.za/ozone-saunas/microsoft-health-vault-explained/">Web Site Disclaimers</a></td>
<td>A free standalone PHR system with some options for sharing information with doctors and others.</td>
</tr>
<tr>
<td><strong>NoMoreClipboard</strong>&lt;br&gt;<a href="http://www.salvagente.co.za/ozone-saunas/microsoft-health-vault-explained/">Web Site Disclaimers</a></td>
<td>A secure, online, easy-to-use tool that helps you compile, manage and share your medical records.</td>
</tr>
<tr>
<td><strong>iBlueButton</strong>&lt;br&gt;<a href="http://www.salvagente.co.za/ozone-saunas/microsoft-health-vault-explained/">Web Site Disclaimers</a></td>
<td>A mobile and secure app to access, compile and share your Blue Button and other records with your doctors.</td>
</tr>
</tbody>
</table>

1. Select a PHR
2. Sign up for record
3. Review applications
4. Recognize how to assist pts
Health Coaching: Personal Health Records

Patient Portals

- Personal health records
- Patient engagement software
- Patient pathways
- Discharge, medication teaching, patient education and pain management.

Telemedicine: Virtual Visits

Growing Scope of Virtual Primary Healthcare

- High Complexity
  - Medical
  - Technical
  - Payment
  - Regulatory
  - Social

- Complex chronic
- Population health management
- Predictive care

- Chronic disease screening and management
- 50%+ of primary care covered

- EMR integration for new and existing patients

- 2009: 9 simple conditions
- 13+ years old

- 2010: Kids 2+ now treated
- Well-managed chronic
- Over 50 conditions

- 2011: High Value
- Health impact
- Large volume

- 2013: zio
- 2015: zio

Care factors that may have an impact on the Clinical Pathway:
PT = Patient

1. HbA1c measured at appropriate interval
   - PT, CT & HS

2. Results reviewed & noted to designated person
   - PT, CT & HS

3. HbA1c value compared with target for patient
   - PT, CT & HS

4. HbA1c target achieved?
   - Yes
     - PT, CT & HS
     - 4. Agree to continue current care plan
     - PT, CT & HS
   - No
     - PT, CT & HS
     - 5. Reinforce guidelines & appropriate follow-up


Build a Virtual Visit Protocol

1. Select one aspect of the critical pathway.
2. Build a protocol for screening and intervention.
3. Role play a virtual visit using “Face Time” or “Skype”

mHealth & Care Coordination for Chronic Disease Mgt

Continuous Glucose Monitoring

• Provide education and monitoring

http://www.medtronicdiabetes.com/treatment-and-products/continuous-glucose-monitoring
mHealth & Care Coordination
Chronic Disease Mgt

Cardiac rhythm and heart failure

• Comprehensive remote monitoring

Health Coaching Tools: Patient Engagement and The Quantified Self

Wearable Computing

• Activity monitors
• Smart Scales
• Diet & weight loss monitors
• Sleep and mood
• HealthIT.gov

- [http://www.healthit.gov/patients-families/stay-well#devices](http://www.healthit.gov/patients-families/stay-well#devices)
mHealth and Chronic Disease Mgt

- **HPT** - Automated blood pressure cuffs that sync with phones
- **Heart disease** - tracks blood pressure, physical activity, cholesterol, glucose, weight and medications.
- **Asthma** - sensors that track triggers for asthma attacks.
- **Smoking** - Online tools for quitting smoking from the American Lung Association
- **Cancer** - iPad app designed to help store and track information related to their care

- [http://www.healthit.gov/patients-families/health-conditions#resources](http://www.healthit.gov/patients-families/health-conditions#resources)

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**Health IT.gov**

Advancing America’s Health Care
Teaching Strategies: Care Coordination and Health Maintenance

App Challenge:

• Recognize how technology can enable patients with chronic disease conditions to better manage their disease.

• Demonstrate the use of an app and its benefits.

**Glucose Buddy:** Includes charts for logging blood-glucose levels, medications, food and exercise. The free app graphically displays log information in graphs, includes an a1c calculator and provides push notifications.
On-The-Go Big Data

http://www.soterawireless.com/
http://www.visimobile.com/
## Evaluating Health Literacy

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<tr>
<th>Diabetes</th>
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<td><strong>iBGStar</strong>Web Site Disclaimers</td>
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1. Select a site on HealthIT.gov
2. Evaluate the site using HON
Online Community Feedback

• How can we make this online community better? Do you have an idea or suggestion you'd like to see implemented? Share it with us and others here. Be sure to check whether or not your idea has been submitted already, and we also encourage you to read and "vote" on others' ideas that you like, as well!

Forum Tools & Information

• This forum is a place to report any bugs or issues you may be experiencing as you explore. Make sure to read the Help section linked at the top of the page first, though! (For diabetes related questions, please visit our other boards.)
Health website evaluation tool
• This page helps you evaluate the quality, credibility, and transparency of a health website by guiding you through questions related to the HON code principles and the EU Quality Criteria for Health-related Websites. After answering a series of questions, the site will be given a score and indications regarding its level of transparency and production quality.

Are the sources of information available clearly identified?
    Yes, valid HTML links to the source information are provided
    Yes, a bibliographic reference to the source of information is given
    Yes, but the contents on the website are originally written by the editor
    No, no reference to the source of information is made
    Don't know
The Intranet of Things and Smart Homes
The Intranet of Things
GlowCaps

http://www.youtube.com/watch?v=LVI4sX6uVs
http://www.youtube.com/watch?v=R-ypgw03sy0
Design a Smart Home

- Security
- Emergency assistance systems and tools
- Reminder systems
- Medication Dispensing
- Home robotics

http://smarthomeenergy.co.uk/what-smart-home
AACN Essentials

- Demonstrate skills in using patient care technologies, information systems, and communication devices that support safe nursing practice.
- Use telecommunication technologies to assist in effective communication in a variety of healthcare settings.
- Apply safeguards and decision making support tools embedded in patient care technologies and information systems to support a safe practice environment for both patients and healthcare workers.
- Understand the use of CIS systems to document interventions related to achieving nurse sensitive outcomes.
  - Use standardized terminology in a care environment that reflects nursing’s unique contribution to patient outcomes.
AACN Essentials

✓ Evaluate data from all relevant sources, including technology, to inform the delivery of care.
✓ Recognize the role of information technology in improving patient care outcomes and creating a safe care environment.
   • Uphold ethical standards related to data security, regulatory requirements, confidentiality, and clients’ right to privacy.
✓ Apply patient care technologies as appropriate to address the needs of a diverse patient population.
✓ Advocate for the use of new patient care technologies for safe, quality care.
✓ Recognize that redesign of workflow and care processes should precede implementation of care technology to facilitate nursing practice.
   • Participate in evaluation of information systems in practice settings through policy and procedure development.
Questions?

Workshop Packet (AACN)

Workshop Webpage (University of Minnesota School of Nursing)
- z.umn.edu/nnideepdive