Clinical Health Informatics: An Overview for Nurses
Chapter 4

WRITTEN BY
DONNA OVENS, CMAA, CTT, HITPRO

EDITED BY:
VALERIE FISHER, RN, MA
HEALTH WORKFORCE INITIATIVE
2013

Disclaimer: This publication was supported by Sub recipient agreement with the Butte-Glenn Community College District under Prime Agreement number H11-0524V from the Sponsor. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the Butte-Glenn Community College District or those of the Sponsor.
“The healthcare industry is undertaking a structural change by aligning Health Information Technology (HIT) with the delivery of care to improve quality, control costs, and enhance the efficiency of the system. The strategy is to build a national health information infrastructure that allows health information to be shared between providers, consumers, and payers in a patient-centric manner.”

_Health Information Technology in the United States: The Information Base for Progress._
_Robert Wood Johnson Foundation - 2012_

By studying this chapter, the nurse will have a greater understanding of the inclusiveness of Health Information Technology and its ability to improve patient outcomes while lowering health care cost.
Course Objectives*

Upon completion of this course nurse will be able to:

1. Identify at least 2 health informatics systems that will ultimately improve patient care.

2. Describe the difference between health information technology, health information management and health informatics.

3. Define health information exchanges (HIE) and their purposes.

4. State at least 3 clinical decision supports features in an EHR.

5. Outline the roll of registered nurses in the emerging field of Nursing Informatics.

* All course objectives meet Quality and Safety Education for Nurses (QSEN) requirements.
Clinical Health Informatics: “Clinical informaticians transform health care by analyzing, designing, implementing, and evaluating information and communication systems that enhance individual and population health outcomes, improve patient care, and strengthen the clinician-patient relationship.” (The American Medical Informatics Association – AMIA)

Health Information Technology: HIT is the area of Information Technology involving the design, development, creation, use and maintenance of information systems for the healthcare industry.

Health Information Management: HIM is the profession that focuses on healthcare data and the management of healthcare information resources. The profession addresses the nature, structure, and translation of data into usable forms of information for the advancement of health and healthcare of individuals and populations.

Electronic Health Record: An electronic health record (EHR) is an official health record for an individual that is shared among multiple facilities and agencies.

Health Information Exchange: HIE is the mobilization of healthcare information electronically across organizations within a region, community or hospital system.
Clinical Decisions Support: The purpose of CDS is to maximize the probability that clinical decisions are evidence-based and customized to the individual patient and specific clinical situation. CDS includes, but is not limited to, computerized alerts and reminders to care providers and patients, methods to bring care into compliance with clinical guidelines/protocols, condition and treatment order sets, advice to promote more accurate & timely diagnoses, contextually relevant reference information, and other tools that enhance decision making in clinical workflow.

Nursing Informatics: “Nursing Informatics is the science and practice that integrates nursing, its information and knowledge, with management of information and communication technologies to promote the health of people, families, and communities worldwide.“ (AMIA)

Quality & Safety Education for Nurses (QSEN): Institute of Medicine’s 2003 report which called for all healthcare educators to teach core competencies that deliver evidenced based care, while continuously addressing quality improvements and effectively employing informatics.
What’s the Difference
HIT, HIM, or HI?

Health Information Technology
“H.I.T.”

SYSTEMS
records, coding,
documentation,
policy, guidelines,
administration,
compliance

Health Information Management
“H.I.M.”

Health Informatics
“Health Informatics is the application of technology tools and information systems in a healthcare setting or context.”

How is Informatics Different from HIT? (Click on Link, 2:13)
Health Informatics

Health Informatics is a science that combines healthcare, information technology and business administration—thus creating medical informatics as well as public health informatics, pharmacy informatics and other information systems.

What is Health Informatics?
(Click on link, 6:04)

Health Informatics – Department of Veteran's Affairs
(Click on link, 4:40)
Definition of **Clinical** Health Informatics

- Clinical Informatics is the scientific discipline that seeks to enhance human health by implementing novel information technology, computer science and knowledge management methodologies to prevent disease, deliver more efficient and safer patient care, increase the effectiveness of translational research, and improve biomedical knowledge access.

- "Clinical informaticians transform health care by analyzing, designing, implementing, and evaluating information and communication systems that enhance individual and population health outcomes, improve patient care, and strengthen the clinician-patient relationship."

  Gardner RM *et al* - Core Content for the Subspecialty of Clinical Informatics
  *J Am Med Inform Assoc. 2009 Mar-Apr;16(2):153-7*
The implementation of the EHR can contribute and transform the delivery of healthcare by enhancing access, improving outcomes, increasing safety by reducing medication errors and reducing health care disparities.

In addition, the new health applications will promote community participation thus empowering patients and families to work together with the common goal of improving the delivery, quality and efficiency of healthcare.

The successful transition from a paper based system to an electronic system will require input from physicians, nurses and ancillary staff.

*How Electronic Health Records are Helping Health Care Providers*  
(Click on link, 1:47)
**Health Information Exchange (HIE)**

- **Health information exchange** (HIE) is the mobilization of healthcare information electronically across organizations within a region, community or healthcare provider system. The goal of HIE is to facilitate access to and retrieval of clinical data to provide safer and more timely, efficient, effective, and equitable patient-centered care.

- There are both public and private HIE’s:
  - **Public HIE**: Is generally used to describe HIE’s which are community-based and are open to, and governed by participants from multiple organizations.
  - **Private HIE**: Is generally refer to HIE’s which operate under the governance a group of facilities or providers that work together to offer a continuum of care to a specific geographic area or market. For example multi-hospital systems or groups of community clinics.

*Health Information Exchange: Making a Difference*

(Click on Link, 4:08)
Example of a Public HIE

- **Healthy Futures** [http://www.myhealthyfutures.org/](http://www.myhealthyfutures.org/) is a public health information system designed to exchange public health related data with other systems, including the RIDE immunization registry and San Joaquin County Public Health departmental systems. This registry contains over 9.2 million immunization records for over 900,000 Californians in Alpine, Amador, Calaveras, Mariposa, Merced, San Joaquin, Stanislaus, and Tuolumne counties.

- **Benefits for providers who participate in the Registry include:**
  1. Consolidates immunization records from all providers into one record
  2. Print accurate, official copies of patient immunization histories at point of service (yellow and blue cards)
  3. Helps manage vaccine inventories
  4. Produce reminder and recall notification for patients
  5. Provide recommendations on immunizations due or overdue
  6. Reduce staff time spent manually retrieving & entering immunization information
Example of a Private HIE

- **Kaiser Permanente Hospitals and Clinics:** Founded in 1945, and now serving over 6 million patients in California alone; Kaiser lead the way in healthcare technology by implementing EHRs called “KP HealthConnect™” in 2007.

- When a patient is seen within one organization, the advantages of all healthcare personnel having instant access to the patient record can:
  1. Improve the quality of care by eliminating unnecessary duplication of x-rays, labs, procedures, etc.
  2. Improve the timeliness of “transition of care” from one department to another. (e.g. x-rays arrive electronically even before the patient gets to the other physician office)
  3. Improves the quality of required documentation with the continuum of care.
The Office of the National Coordinators for Health IT: Assist states with the implementation of statewide HIEs and supports efforts to rapidly increase connectivity that enable the secure flow of patient-centric information across the health care system—within and across states. Demonstrating the secure sharing of information among providers is an essential part of using EHRs in a meaningful way.

In California, UC Davis Health System’s Institute for Population Health Improvement is hosting the “California Health eQuality (CHeQ)” or the interstate HIE system. For more information: [http://www.ucdmc.ucdavis.edu/iph/Programs/cheq/index.html](http://www.ucdmc.ucdavis.edu/iph/Programs/cheq/index.html)

In addition, formation of an intrastate HIE is underway. The Western States Consortium (WSC) is a group of states who share the common goal of creating policy and procedure to lay the groundwork for safe interstate electronic transfer of secure health information. For more information: [http://www.ohii.ca.gov/calohi/PrivacySecurity/WesternStatesConsortium.aspx](http://www.ohii.ca.gov/calohi/PrivacySecurity/WesternStatesConsortium.aspx)
Clinical Decision Support Systems (CDSS)

- Clinical decision support system is the brains behind an advanced implementation of electronic health records. EHRs, e-prescribing systems, computerized physician order entry, and medication reconciliation systems all are strengthened by some form of clinical decision support system. Standard features are: multi-parameter alerting, nursing care plans, reference content, and drug information databases. Different vendors (or products) offer different features, but all have one thing in common; added patient safety is the main goal.

- CDSS also include specific alerts that are built into the system but can be customized for specific clinical areas: Lab test alerts, drug interaction alerts, practice and administrative reminders.

The Critical Difference Between EMR & a Clinical Decision Support System (Click on link, 1:06)

Clinical Decision Support Systems (Clink on link, 2:43)
Advances in healthcare technology is dramatically changing much of what we did in the past and how we did it (which is a good thing), however technology is marvelous except when there is....

1. A lack of systems integrations and interoperability
2. Inadequate screen designs and functionality
3. Failure to implement informatics principles
4. Lack of interface with other related agencies or departments
5. Inability to move from silo mentality to a multidisciplinary perspective


As a nurse, *if you have the opportunity to get involved with the selection of new technology at your facility – join in to make sure the technology intersects well with your nursing practice!*  

*Bringing Clinicians into the Health IT Fold* (Click on link, 2:54)
Clinical Health Informatics is here to stay and is now integrated into most clinical settings in hospitals, clinics and MD offices. In addition, quality improvements can be easily tracked with ongoing data collection leading to more evidenced-based practices and procedures.

Electronic Health Records and use of Health Information Exchanges will improve the quality of care now and in the future, provided, of course, the documentation is complete and accurate.

Use of Clinical Decision Support Systems built into EHRs should increase patient safety with internal alerts, while assisting physicians and nurses with ordering of medications and laboratory tests, improving the quality of care by providing better follow-up on previously ordered procedures and tests.

Continuity of care should also improve with the use of EHR & HIE since the patients health records can easily transfer from one clinician to another.
Nursing Informatics

- Nursing informatics is a career that focuses on finding ways to improve information management and communications in nursing to improve efficiency, reduce costs and enhance the quality of patient care.

- The American Nurses Association defines nursing informatics as “a 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, information 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.” (ANA Scope and Standards of Nursing Informatics Practice, 2001, pg. vii.)
What is Nursing Informatics?

- **What is Nursing Informatics** (Click on link, 6:59)

- **AMIA -Nursing Informatics History Project** (Click on link, 0:50)

- Nationally recognized organizations:
  - American Nursing Informatics Association - [https://www.ania.org/](https://www.ania.org/)
Are You Interested in the Field of Nursing Informatics?

- Most nurse informaticists begin their careers as registered nurses. It is important for nurse informaticists to understand the nursing process, so they can design systems that will solve problems with patient care.
- This career involves extensive project management, critical thinking and creativity. Nurse informaticists must be able to work effectively with many different kinds of people. They must be skilled in resolving conflicting demands to develop systems that meet everyone’s needs.
- Advanced training and Board Certification in Nursing Informatics can be obtained from the American Nurses’ Association Credentialing Center. You can also become a Certified Professional in Healthcare Information Management Systems (CPHIMS) or a Certified Professional in Health Information Technology (CPHIT).

- Find out more information (including salary) at: [http://explorehealthcareers.org/en/Career/91/Nursing_Informatics](http://explorehealthcareers.org/en/Career/91/Nursing_Informatics)
- A Website to further your Health IT skills [http://www.healthitcertification.com/](http://www.healthitcertification.com/)
- Several universities also offer degree or certificate programs in Health Informatics. (Search database at: [http://www.amia.org/education/programs-and-courses](http://www.amia.org/education/programs-and-courses))
Questions for Review

1. Define Clinical Health Informatics.

2. Name the two different types of health information exchanges (HIE)?

3. What is a Clinical Decision Support System? And what are the potentially life saving features it contains?

4. Describe are some of the technological barriers identified in HIT?

5. What are the professional characteristics essential for becoming a successful Nurse Informaticists?