

Introduction to Nursing Informatics & Health Information Technology for Student Nurses

Course Overview

In this 8 hour course, ADN nursing students will be introduced to health information systems and informatics concepts that they will most likely experience in a clinical setting. Course content will focus on general HIT concepts, terminology and key health information systems. Students will explore their own role as nurses in implementing patient-centered care in an environment of advancing technology. Students will critically evaluate health information systems and their role in patient safety, safe medication administration, maintenance of patient privacy, data security, and efficacy of health care processes. Students will also have hands on practice in a clinical information system and demonstrate an understanding of some common elements of HIT systems. Standards of practice and competencies will be based on a combination of industry standards, including the Office of National Coordinator for Health Information Technology (ONC), the American Nurses Association (ANA), the National League of Nursing (NLN), Quality and Safety Education for Nurses (QSEN), Technology Informatics Guiding Education Reform (TIGER), Institutes of Medicine (IOM) and the JCAHO Patient Safety Goals.

Course Objectives

At the completion of the 8 hour course, the student nurse will be able to:

1. Describe the precipitating factors that have led to a need for health care information systems in the patient care setting
2. Provide examples of different types of health information systems technology used in the hospital setting
3. Demonstrate the effect health information technologies have on patient safety
4. Identify ways to maintain patient privacy and security of data in the hospital setting
5. Analyze current ethical issues that arise out of the use of health information technology
6. Compare and contrast different health IT systems and their role in patient-centered care
7. Demonstrate the use of a bedside charting system

Course Format

The course is a mix of classroom lecture and discussion balanced by application-based activities. Prior to the classroom session, students will be expected to complete the Pretest for Attitudes Toward Computers in Healthcare (PATCH) self-assessment tool. Students will meet for a four hour classroom session where key concepts and material are presented. Following the lecture, students are to reflect on their experience with different documentation systems describing their observations in a brief two page paper. In addition, students will also access a cloud-based simulated Electronic Health Records system where they will experience firsthand software navigation and data input for a variety of demo patient scenarios. Additional critical thinking activities have also been identified depending on student level/ability.*

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- Activity 1: Write a 2 page paper discussing two documentation systems you have used while in nursing school. One system must be computer –based. Compare and contrast each system and discuss how each system:
 - Supported patient safety
 - Incorporated EBP
 - Supported safe medication administration
 - Patient and Data security, privacy and confidentiality
- Activity 2: Complete identified tasks in ToolWire’s cloud-based simulated Electronic Health Records System
- Activity 3*: Online discussion regarding NPSGs (National Patient Safety Goals) and/or a review/discussion of some of these case studies submitted to HIMSS and co-sponsor American Society for Quality (ASQ): <http://www.himss.org/storiesofsuccess/caseStudies.asp>
- Activity 4*: Online discussion of current news articles highlighting ethics/security issues involving EHRS

http://www.computerworld.com/s/article/9204898/Three_fired_for_accessing_records_of_Tucson_shooting_victims

http://www.computerworld.com/s/article/9130827/Kaiser_fires_15_workers_for_snooping_in_octuplet_mom's_medical_records

<http://www.radioiowa.com/2011/01/28/iowa-launches-investigation-into-unauthorized-access-of-medical-records-of-football-players/>

Course Materials

- PowerPoint Slides
- Pretest for Attitudes Toward Computers in Healthcare (PATCH) self-assessment tool
- Supplemental readings (handouts and weblinks)
- Moodle course site
- ToolWire simulated Electronic Health Records system

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ONC Curriculum Elements relevant to Nursing

#4 Introduction to Information and Computer Science

- High level overview of computers and internet use in healthcare
 - Explain the development of computers and the Internet, including healthcare systems up until the present time
- Introduction to importance of security in health care
 - List and describe common security concerns (viruses, worms, etc.)
 - Describe safeguards against common security concerns, including firewalls, encryption, virus protection software and patterns, programming for security, etc.
 - Describe security concerns for wireless networks and how to address them.
- Describe latest advances in technology as applicable to healthcare
- Future of computing as related to health care

#5 History of Health Information Technology in the US

- Evolution of Health IT
 - Introduce Meaningful Use
- Privacy and Security
 - List security concerns/regulations for health care applications.
 - Describe security safeguards used for health care applications.
- Patient-related issues and Role of HIT
 - Discuss implications for healthcare systems, including potential risks

#6 Health Management Information Systems

- What is Health Informatics?
 - Summarize how the Institute of Medicine's *Vision for 21st Century Health Care and Wellness* may impact health management information systems. (**may read select portions of document*)
- Hardware and Software Supporting Health Information Systems
 - Describe various types of technologies (e.g. medication administration systems/bar-coding, chart tracking, patient databases) that support health care information systems.
 - Examine the challenges presented by emerging trends in information technology (e.g., mobility, web services, the Internet, Intranet, and wireless computing), social media, and global communications.
- Electronic Health Records
 - Definitions of an electronic medical record (EMR) and electronic health record (EHR)
 - Identify attributes and functions of an HER
 - Impact of EHRs on patient care, safety, efficacy of care practices and outcomes

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- Governmental efforts related to EHR systems including meaningful use of interoperable health information technology and a qualified EHR (define meaningful use and its implications for nurses)
- Computerized Provider Order Entry (CPOE)
 - Describe the purpose, attributes and functions of CPOE
 - Explain ways in which CPOE is currently being used in health care
 - Discuss the major values to CPOE adoption
 - Identify how CPOE can affect patient care safety, quality and efficiency, as well as patient outcomes (the role nurses play using CPOE- taking and transcribing orders, elements required to perform CPOE correctly)
- Clinical Decision Support Systems
 - Definition of a clinical decision support system
 - Discuss the importance of clinical practice guidelines and evidence-based practice and how these affect clinical decision support systems (potential for nurse exposure to these systems and how they affect nursing care of patients at the bedside, clinic, etc)
- Patient Monitoring Systems
 - Purpose, attributes and functions of patient monitoring systems (Types of systems nurses may use)
 - Applications of and ways in which automation can improve the quality of patient care advantages and disadvantages of using computers at the bedside
- Medical Imaging Systems
 - *Briefly:* Examine the purposes, processes, and management issues related to the use of imaging systems in health care. (how a nurse might interact with these kinds of systems)
- Consumer Health Informatics *Briefly:* Describe the emergence of Personal Health
 - Records and their implications for patients, health care providers, and health systems. (relating to how patients use these resources to improve their own health management)

7 : Consumer Health Informatics

- Introduction & Overview: Components of HIT Systems
 - Define a system and relate systems concepts to HIT
 - Discuss specific examples of settings where Health IT is used (acute, rural, public health, clinic, office, patient home, etc.)
 - Identify common components of a clinical HIT system
 - Demonstrate beginning level competency in maneuvering the demonstration EHRs
- Facilitated Error – Cause and Effect (relating to potential errors nurses may make)
 - Different classes of HIT errors (slips/mistakes, omission/commission) will be discussed and differentiated.
- Protecting Privacy, Security, and Confidentiality in HIT Systems

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- Explain and illustrate privacy, security, and confidentiality in HIT settings.
 - Identify common threats encountered when using HIT.
 - Formulate strategies to minimize threats to privacy, security, and confidentiality in HIT systems.
- HIT and Aspects of Patient-Centered Care
 - Define patient-centered care.
 - Suggest HIT-enabled solutions/strategies to enhance patient involvement in health and healthcare
 - Assess the effectiveness of HIT systems in supporting patient-centered care.

#10 Fundamentals of Health Workflow Process Analysis & Redesign

- Define workflow
- Describe how the workflow processes used by a healthcare facility might differ depending on facility type

#12 Quality Improvement

- HIT design to support Teamwork and Communication (
 - the role the nurse plays in using these *tools*)
 - The focus is on electronic tools to support communication and teamwork during hand-off, care planning, and care transitions.
 - Incorporation of automatic referral requests, data transfer to longitudinal records, and shared problem lists and daily goal forms into the EHR is discussed as well as the utility of electronic whiteboards and clipboard tools.
- HIT Design for Quality Reporting
 - the role the nurse plays in using HIT to provide accurate and useful quality reporting and data
 - Examine the importance of standardized and structured health information. (*standardize language for example*)
 - Discuss how HIT can facilitate data collection and reporting for improving quality and safety.

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Literature Review for Nursing Informatics and Health Information Technology

Nursing informatics competencies:

<http://nursing-informatics.com/niassess/competencies.html>

User level technical competencies include:

1. uses word processing applications
2. demonstrates keyboarding skills
3. uses spreadsheet applications
4. uses telecommunication devices to communicate with other systems
5. uses e-mail systems to communicate with other health care professionals
6. uses presentation applications to create slides, displays, overheads (PowerPoint, Corel Presentation, etc.)
7. uses multimedia presentations
8. uses internet resources to locate client support groups, online resources
9. uses sources of data that relate to nursing practice and care
10. accesses, enters and retrieves data related to client care via available hospital or nursing information systems
11. uses database management programs to develop and access databases and tables
12. uses database applications to enter and retrieve data and information
13. conducts online and database literature searches
14. uses decision support systems, expert systems and other aids for clinical decision making and care planning
15. uses computer applications to document client care
16. uses computer applications to plan client care, including discharge planning
17. uses computer applications to enter client data (demographic, vital signs, physiological data)
18. uses information management systems for client education
19. uses technology based client monitoring systems
20. operates peripheral devices (bedside and hand held)
21. uses operating systems
22. uses computer peripheral devices (CD ROMs, DVD, zip drives)
23. uses computer technology safely
24. navigates in Windows environment effectively
25. demonstrates basic technology skills (load paper, change toner, unjam printers, print)

User level utility competencies include:

1. recognizes the relevance of nursing data for improving practice
2. recognizes limitations of computer applications

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3. recognizes need for continual learning in informatics skills, applications and knowledge
4. recognizes the nature of computer - human interfaces and assesses impact on client care
5. understands the basic process of using networks for electronic communication
6. recognizes the basic components of computer systems

User level leadership competencies include:

1. uses computerized management systems to record administrative data (billing data, quality assurance data, workload data, etc.)
2. uses applications for structured data entry (classification systems, acuity level, etc.)
3. understands client rights related to computerized information
4. recognizes the utility of nurse involvement in the planning, design, choice and implementation of information systems in the practice environment
5. incorporates a Code of Ethics in regards to client privacy and confidentiality

QSEN (Quality and Safety Education for Nurses) Pre licensure:

http://www.qsen.org/ksas_prelicensure.php#informatics

Informatics

Definition: Use information and technology to communicate, manage knowledge, mitigate error, and support decision making.

Knowledge	Skills	Attitudes
Explain why information and technology skills are essential for safe patient care	Seek education about how information is managed in care settings before providing care Apply technology and information management tools to support safe processes of care	Appreciate the necessity for all health professionals to seek lifelong, continuous learning of information technology skills
Identify essential information that must be available in a common database to support patient care	Navigate the electronic health record	Value technologies that support clinical decision-making, error prevention, and care coordination
Contrast benefits and limitations of different communication	Document and plan patient care in an	Protect confidentiality of

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technologies and their impact on safety and quality	electronic health record	protected health information in electronic health records
	Employ communication technologies to coordinate care for patients	
	Respond appropriately to clinical decision-making supports and alerts	
Describe examples of how technology and information management are related to the quality and safety of patient care	Use information management tools to monitor outcomes of care processes	Value nurses' involvement in design, selection, implementation, and evaluation of information technologies to support patient care
Recognize the time, effort, and skill required for computers, databases and other technologies to become reliable and effective tools for patient care	Use high quality electronic sources of healthcare information	

The Technology Informatics Guiding Education Reform (TIGER)

http://www.tigersummit.com/Home_Page.php

KEY ACTIONS: EDUCATION

Vision Statement: Collaborative learning communities that maximize the possibilities of technology toward knowledge development and dissemination, driving rapid deployment and implementation of best practices.

- *Reform the nursing curriculum through integration of IT, information literacy, and informatics and the infusion of technologies for learning. (65%)*
- *Seek funding to develop and implement learning innovations, foster faculty development, and ensure necessary infrastructure. (41%)*
- *Identify, model, and implement collaborative partnerships among public and private academic, service, and industry enterprises. (40%)*
- *Increase faculty acceptance of technology through education and training, incentives, and necessary supports. (38%)*
- *Convene a national group to develop strategies for the recruitment, retention, and training of current and future workforces in informatics education, practice and research. (37%)*

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Results of a Delphi Study to Determine Informatics Competencies for Nurses

<http://nursing.utah.edu/programs/masters/specialty/Informatics/competencies.pdf>

Beginning nurse Level 1:

Computer Skills - Administration

- Uses administrative applications for practice management (e.g., searches for patient, retrieves demographics, billing data)
- Uses applications for structured data entry (e.g., patient acuity or classification applications)

Computer Skills – Communication (email, internet, telecommunications)

- Uses telecommunication devices (e.g., modems or other devices) to communicate with other systems (e.g., access data, upload, download)
- Use e-mail (e.g., create, send, respond, use attachments)
- Uses the Internet to locate, download items of interest (e.g., patient, nursing resources)

Computer Skills – Data access

- Uses sources of data that relate to practice and care
- Accesses, enters, and retrieves data used locally for patient care (e.g., uses HIS, CIS for plans of care, assessments, interventions, notes, discharge planning)
- Uses database applications to enter and retrieve information
- Conducts on-line literature searches

Computer Skills - Documentation

- Uses an application to document patient care
- Uses an application to plan care for patients to include discharge planning
- Uses an application to enter patient data (e.g., vital signs)

Computer Skills – Education

- Uses information management technologies for patient education (e.g., identifies areas for instruction, conducts education, evaluates outcomes, resources)
- Computer Skills-Monitoring
- Uses computerized patient monitoring systems

Computer Skills – Basic Desktop Software

- Uses multimedia presentations
- Uses word processing
- § Demonstrates keyboarding (typing) skills
- Computer Skills - Systems
- Uses networks to navigate systems (e.g., file servers, www)
- Operates peripheral devices (e.g., bedside terminals, hand-helds)
- Uses operating systems (e.g., copy, delete, change directories)
- Uses existing external peripheral devices (e.g., CD-ROMs, zip drives)
- Uses computer technology safely

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- Is able to navigate Windows (e.g., manipulate files using file manager, determine active printer, access installed applications, create & delete directories)
- Identifies the appropriate technology to capture the required patient data (e.g., fetal monitoring device)
- Demonstrates basic technology skills (e.g., turn computer off & on, load paper, change toner, remove paper jams, print documents)
- Informatics Knowledge – Data
- Recognizes the use and/or importance of nursing data for improving practice
- Informatics Knowledge - Impact
- Recognizes that a computer program has limitations due to its design and capacity of the computer
- Recognizes that it takes time, persistent effort, and skill for computers to become an effective tool
- Recognizes that health computing will become more common
- Recognizes that the computer is only a tool to provide better nursing care and that there are human functions that cannot be performed by computer
- Recognizes that one does not have to be a computer programmer to make effective use of the computer in nursing

Informatics Knowledge – Privacy/security

- Seeks available resources to help formulate ethical decisions in computing
- Describes patients' rights as they pertain to computerized information management
- Informatics Knowledge - Systems
- Recognizes the value of clinicians' involvement in the design, selection, implementation, and evaluation of applications, systems in health care
- Describes the computerized or manual paper system that is present
- Explains the use of networks for electronic communication (e.g., Internet)
- Identifies the basic components of the current computer system (e.g., features of a PC, workstation)

QSEN and TIGER are referenced by NLN here:

http://www.nln.org/aboutnln/PositionStatements/informatics_052808.pdf

NLN content areas recommended:

<http://www.nln.org/facultydevelopment/facultyresources/informatics.htm>

Use of health information technology to augment/support the nursing care process - includes concepts such as safety, care improvement, decision assistance/support, outcome analysis and data analysis.

Communication – includes electronic health records, personal health records, standardized languages and terminology.

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Issues – including legal, ethical, social, security, advocacy, and public policy.

Nursing involvement through teamwork/collaboration – covering nurses's role in determining usability, workflow analysis, and systems selection/evaluation.

Scope and Standards of Nursing Informatics Practice (ANA)

www.nursingworld.org/practice/niworkgroup/InformaticsStd01FINAL.doc

Overall informatics competencies

The following overall informatics competencies are required of beginning nurses, those individuals first learning about or entering into nursing practice. Overall informatics activities may include but are not limited to:

- Identifying, collecting, and recording data relevant to the nursing care of patients.
- Analyzing and interpreting patient and nursing information as part of the planning for the provision of nursing services.
- Using informatics applications designed for the practice of nursing.
- Implementing public and institutional policies related to privacy, confidentiality, and security of information. These include patient care information, confidential employer information, and other information gained in the nurses' professional capacity.

Health Professions Education: a bridge to quality

http://www.nap.edu/catalog.php?record_id=10681#toc

IOM Core Competencies Include: Utilize informatics to reduce errors, manage knowledge and information, make decisions and communicate.