



NMNEC Concept: **Technology and Informatics**

Mega Concept: Professional Nursing

Category: Care Competencies

Concept Name: Technology and Informatics

Concept Definition:

Health information technology (HIT) is the framework for extensive information management and data exchange among insurers, providers, and consumers (Skiba and Connors, 2017). It is the application of information, knowledge, and the skill to use available resources to engage and deliver health care at all levels of delivery, that is, the patient, health care team, and organizational structures.

Scope and Categories:

Health Information and communication technology are significant to health care by tracking and helping to improve patient and organizational health care outcomes. Informatics applications, such as electronic health records (EHRs) and computerized physician order entries, permit access to the system for accurate patient information. Evidence-based practices can be accessed by health care providers and patients at the point of care, which can provide information for clinical decision making (Skiba and Connors, 2017; Kleib, Simpson, & Rhodes, 2016).

Successful integration of information, communication technology, and informatics in the delivery of health care requires:

- An effective design respecting both human and ergonomic principles
- An effective interface with the health care participant, environment, and/or patient
- An effective plan for integration of technology into the practice setting
- An effective maintenance plan (Powell-Cope, Nelson, & Patterson, 2008)

Attributes and Criteria:

- Health Information technology (HIT)
 - Clinical information systems



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- Hardware—the physical devices and equipment
- Software—the applications, programs, and structure of information
- Standardized information systems and standardized nursing terminology
 - The Minimum Data Set (MDS) is the collection of data with consistent definitions and categories, such as the Uniform Hospital Discharge Data Set. The American Nurses Association (ANA) recognizes several standardized terminologies, which support nursing practice, such as:
 - North American Nursing Diagnosis Association (NANDA)
 - Five-digit Health Insurance Portability and Accountability Act (HIPAA) compliant alpha codes (ABC codes)
 - Clinical Care Classification (CCC) System
 - Nursing Minimum Data Sets (NMDS)
 - Nursing Management Minimum Data Set (NMMD)
 - Nursing Interventions Classification (NIC)
 - Nursing Outcomes Classifications (NOC)
 - Omaha System (do not abbreviate)
 - Perioperative Nursing Data Sets (PNDS)
 - International Classification for Nursing Practice (ICNP)
 - Logical Observation Identifiers Names and Codes (LOINC)
 - Systematized Nomenclature of Medicine—Clinical Term (SNOMED or SNOMED-CT)
- Policies
 - Health Information Exchange (HIE) is a means for health care providers and patients to share patient information across platforms.
 - The Office of the National Coordinator of Health IT (ONC) is the government agency that supports, promotes, develops, and implements policies of HIT and exchange.
- Privacy and Security
 - HIPAA protects the privacy of an individual’s identifiable health information. The U.S. Department of Human Services enforces this law.
- Informatics Workforce
 - Several organizations, such as the American Nursing Informatics Association (<https://www.ania.org/>), have suggested the competencies necessary for the safe and effective utilization of health care informatics. The role of nursing informatics



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will continue to evolve as technology and demand change. There will continue to be a growing need for those who can integrate their nursing expertise with information technology.

- **People-ware and Organizational Skills**
 - Individual people and their role in the development and the use of computer hardware and software systems.
- **Medical**
 - Devices that are used in the delivery of health care
 - Devices are used for several purposes in health care, including diagnosis, prevention, monitoring, treatment, and alleviation of disease and injury.
 - The clinical effectiveness of the device should be supported by objective, scientific evidence.
 - The performance of the device includes how it functions to achieve effectiveness, as well as other features, such as alarms.
- **Library Searches**
 - A database of categorized bibliographic items located in a library, such as a network of documents at several locations. Types of databases within a library network:
 - Cumulative Index to Nursing and Allied Health Literature (CINAHL)
 - Educational Research Information Clearinghouse (ERIC)
 - MEDLINE/PubMed Resources Guide—National Library of Medicine
 - Psychological Information Database (PsychINFO)
 - Cochrane Database

Theoretical Link(s):

Informatics and technology incorporate a variety of scientific arenas of theory, including nursing, cognitive, information, computer, organizational, and engineering.

In the Context of Nursing/Health Care:

Nurses frequently use information technology and informatics both inside and outside health care environments. Nurses' familiarity with and knowledge of technology are essential for delivery of safe, competent, and effective care and data management outcomes. The nursing process remains essential and relevant for ongoing success while working with information



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technology. Blumenthal (2010) stated, “Widespread and meaningful use of fully functional electronic health record systems combined with a robust infrastructure for broad-based health information exchange can improve the quality, safety, and efficiency of health care for all Americans” (para. 1).

Knowledge:

Possessing both theoretical and practical competence in the safe utilization of technology and informatics in the health care setting.

Nurses need to know how to:

- Safely operate technology systems and equipment.
- Understand the processes of technology and their relationship to the health care setting (e.g., hardware, software, health care equipment).
- Describe technology privacy standards inside and outside of the health care setting (e.g., HIPAA).
- Recognize benefits and limitations to technology systems and equipment.
- Understand the standardized terminology recognized by the ANA related to electronic health records (EHRs) (e.g., standardized information systems).
- Recognize the difference between appropriate and inappropriate technology uses.

Skills:

Able to use technologies that contribute to secure and safe delivery of care.

Nurses need to:

- Effectively use technology systems and equipment safely.
- Communicate concerns related to technology function and use.
- Judge effectiveness of technology and patient care equipment.
- Practice a high standard of communication in technology applications (e.g., “netiquette”).

Attitudes:

Nurses’ personal and professional attitudes regarding technology can contribute to the safe and effective delivery of care.

Nurses need to:



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- Value their role in technology implementation and integration.
- Collaborate with members of the health care team to effectively implement and use technology.
- Recognize how personal beliefs and experiences affect the use of technology.

Interrelated Concepts:

- **Leadership:** The nurse must have effective relationships with stakeholders to successfully implement new technology and informatics to achieve the organizational goal or vision.
- **Communication:** Technology and informatics impact the method and effectiveness of communication between health care providers and patients.
- **Health Care Quality:** Technology and informatics provide data for evaluating, monitoring, and improving health care quality.
- **Health Care Law:** HIPAA requires safeguards to patient privacy and protection of identifiable health information in the EHR.
- **Collaboration:** Nurses collaborate with interprofessional teams in the health care setting using technology and informatics to achieve quality patient care.
- **Safety:** The nurse must practice vigilance in the ongoing risk assessment of technology, informatics, and health information system in the health care setting.
- **Patient Education:** Technology and informatics present opportunities and challenges for patient education.
- **Health Care Delivery Systems:** Health care delivery systems will become increasingly dependent on the use of technology and informatics.

Exemplars:

New Mexico Nursing Education Consortium (NMNEC) Required Exemplars:

- **Clinical Informatics**
 - Indirect Nursing Care Delivery Technology
 - Medication storage and dispensing systems
 - Supply dispensing systems
 - Barcode medication administration
 - Electronic health records (EHRs)
 - Telehealth tools



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- Clinical Health Care Informatics
 - Clinical decision support system
 - System life cycle
 - Practice guidelines
- Direct Nursing Care Delivery Technology
 - Physiologic monitoring
 - ECG monitoring
 - Pulse oximetry
 - Glucometer
- **Consumer Health Informatics**
 - Personal health records
 - Patient portals
 - Social media tools for online support
 - Home and self-care monitor devices
 - Smart devices and sensors
- **Library Searches**
 - Databases of categorized bibliographic items located in a library, such as through a network of documents at several locations

Optional Exemplars:

- **Biosurveillance Tools**
 - Biostatistics
 - Data management
 - Disease surveillance and preparedness tools
 - Immunizations registries
- **Bio Informatics Tools**
 - Data mining and data analytic tools
 - Structural and sequence tools
 - Homology and similarity tools



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Resources:

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