

# Preparing Confident and Informed Faculty to Integrate Informatics and Information Technology into Student Learning

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## Objectives

- Explore the concept of Informatics.
- Identify the information and communication technologies used.
- Differentiate informatics as a subject matter for all nurses from that of the Informatics Nurse Specialist.
- Examine the five buckets of Domain 8 competencies.
- Consider integration versus standalone teaching.
- Appraise resources to use in both teaching and personal professional development.

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# Questions

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- What is Informatics?
- What are the technologies?
- Who teaches informatics?
- How do you teach it?

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# Background

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## Informatics versus Information/Communication Technology

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- Informatics is a process that moved data to information to knowledge to wisdom.



- Information and communications technologies are tools as is paper and pencil and calculator.

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## Definition - Informatics

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- **Informatics** is the science of how to use data, information and knowledge to improve human health and the delivery of health care services.
- **Biomedical and health informatics** applies principles of computer and information science to the advancement of life sciences research, health professions education, public health, and patient care. This multidisciplinary and integrative field focuses on health information technologies (HIT), and involves the computer, cognitive, and social sciences.
- **Health Information Technology** is an essential part of informatics but technology and technological considerations are only components of informatics as a science.
- **Health Information Technology** enables advancements in health care by providing the tools with which to set knowledge in motion.

The American Medical Informatics Association (AMIA)

<https://amia.org/about-amia/why-informatics/informatics-research-and-practice>

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## Definition – Nursing Informatics

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Nursing informatics is the specialty that transforms data into needed information and leverages technologies to improve health and healthcare equity, safety, quality, and outcomes.

*Nursing Informatics: Scope and Standards of Practice, Third Edition (2022, in press)*

# Some Background: Informatics is not new

## Brief History – Informatics in Nursing

- 1950's – Harriet H. Werley PhD, RN FAAN, FACMI - identified data processing needs for healthcare and explored potential uses of computers by nurses in care settings
- 1960s – The American Nurses Association - committee to identify priorities for the use of computers by nurses to support communication and decision making
- 1970s – First report of computer applications in nursing appears.
- 1980s - Nursing Informatics as a specialty gains momentum. Dr. Virginia Saba organizes a track for nursing papers at the Symposium on Computer Applications in Medical Care (SCAMC)

Nursing Minimum Data set developed led by Drs. Werley and Norma Lang

- *Ozbolt and Saba, 2008*

## Brief History – Informatics in Nursing

- 1980s – Nursing terminologies began development  
Nursing Informatics as a specialty in graduate nursing began
- 1990s – Web based application development enabled due to internet introduction  
American Nurses Association and National League for Nurses convene conference of nursing informatics leaders. They produce: *Next Generation Nursing Information Systems: Essential Characteristics for Professional Practices*. This formed the basis for the specialty going forward.
- 1994 – the first ANA Scope and Standards of Nursing Informatics published
  - *Ozbolt and Saba, 2008*

# The Informatics Nurse Specialist

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## Relationships – Competencies, Standards, Accreditation, Certification

### COMPETENCIES FOR STUDENTS

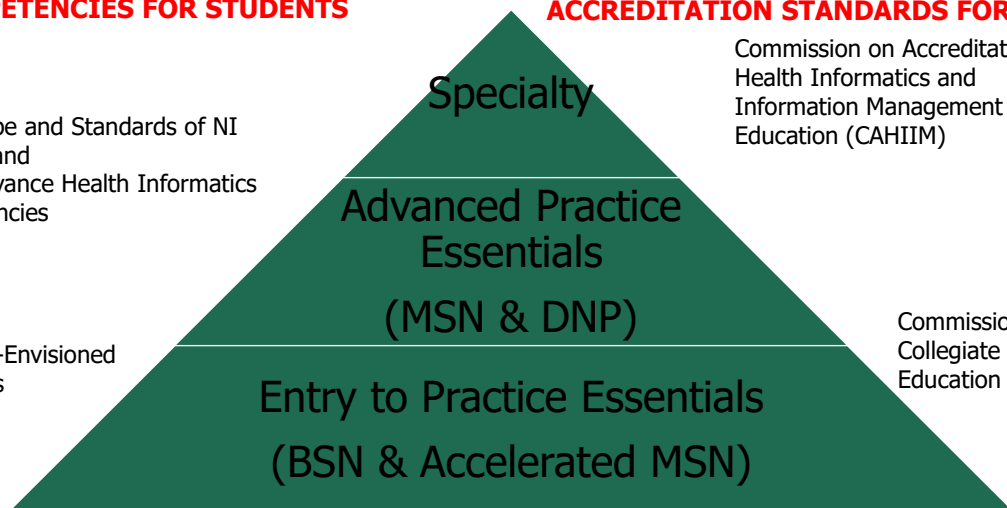
### ACCREDITATION STANDARDS FOR EDUCATION

ANA Scope and Standards of NI Practice and AMIA Advance Health Informatics Competencies

AACN Re-Envisioned Essentials

Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM)

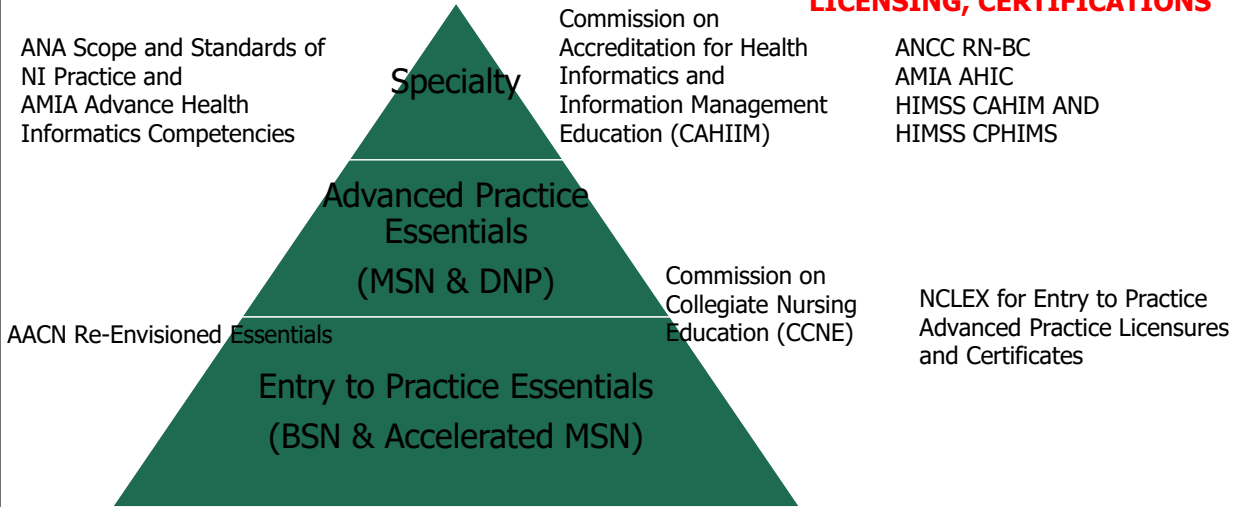
Commission on Collegiate Nursing Education (CCNE)



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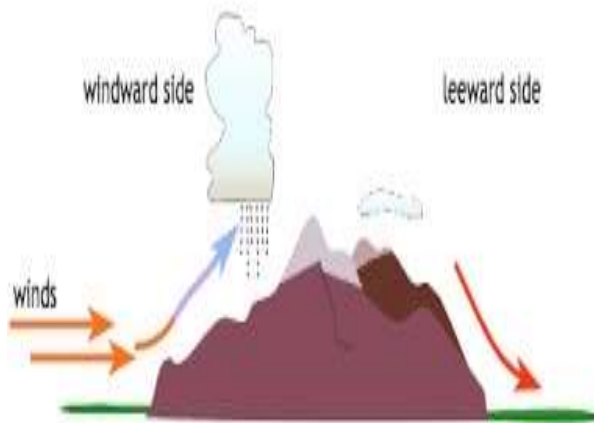
# Relationships – Competencies, Standards, Accreditation, Certification

## LICENSING, CERTIFICATIONS



# Informatics Competency for All Nurses

## Driving Forces



## Shaping Forces

- Pandemics/Epidemics
- Societal demand/Consumer expectations
- Expansion of technology (proceeds policy, regulation, and payment)
- Public Policy
- Practice Needs
  - Policy
  - Regulation
  - Payment/Finance



# MOVE TOWARDS DIGITAL HEALTH

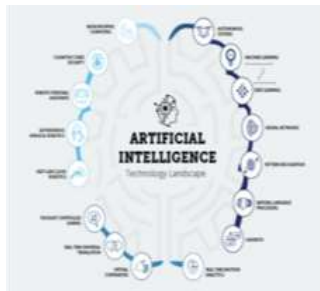
- Digital health, or digital healthcare, is a broad, multidisciplinary concept that includes concepts from an intersection between technology and healthcare.
- Digital health applies [digital transformation](#) to the healthcare field, incorporating software, hardware and services.
- Digital health includes mobile health ([mHealth](#)) apps, electronic health records ([EHRs](#)), electronic medical records (EMRs), [wearable devices](#), telehealth and [telemedicine](#), as well as personalized medicine.
- Stakeholders in the digital health field include patients, practitioners, researchers, application developers, and medical device manufacturers and distributors. Digital healthcare plays an increasingly [important role in healthcare today](#).

# TECHNOLOGY AND DATA RICH ENVIRONMENTS



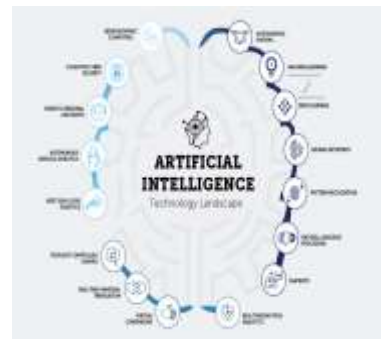
# The Health Information Technology Landscape

- •Electronic Health Records
- •Personal Health Records
- •Artificial Intelligence
- •Robotics/Drones
- •Assistive Living
- •Mobile Apps
- •Social Media
- •Personalized/Precision Care
- •Telehealth/Telepsych/Tele\*\*\*
- •Virtual/Augmented Reality



## EXPANSION OF TECHNOLOGIES

- EHRs evolving new capabilities
  - Digital Voice Assistants
- Artificial Intelligence/Big Data
  - Predictive Models
  - Input Layer, Hidden Layer, Output Layer
  - Clancy, T (2020). Artificial intelligence and nursing: The future is now. *JONA*.
- Automation Technologies
  - Robotics/Drones
  - <https://youtu.be/JM1vUmjOHI>
  - <https://medicalfuturist.com/medical-drones-2021/>



## EXPANSION OF TECHNOLOGIES

- Personalized/Precision Healthcare

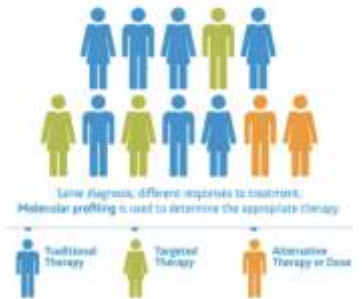
- [https://youtu.be/fOKO\\_537YAU](https://youtu.be/fOKO_537YAU)
- Fu, M.R., Kurnat-Thoma, E, Starkweather, A. (et al.)  
Precision health: A nursing perspective. Int J Nurs Science. 7(1): 5-12.

- Social Media/OnLine Information

- <https://www.patientslikeme.com>

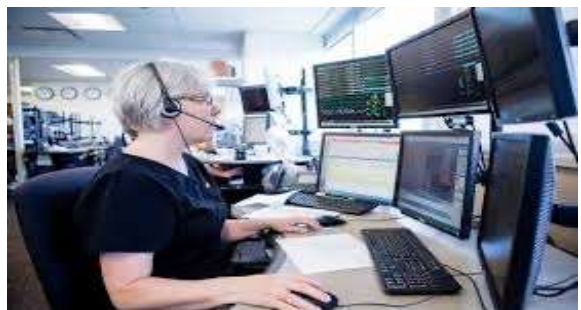
- Virtual/Augmented Reality

- <https://youtu.be/uCQU6g1J4HM>



## EXAMPLE: MERCY VIRTUAL

- Mercy Virtual



- <https://youtu.be/d-Fu2mpK5iE>

# THERE IS AN ISSUE



## There is a problem – There is a Gap

- Findings demonstrate a significant gap in informatics competency among practicing clinicians, including nurses.
  - Nurses entering the workforce are not prepared and lack informatics competencies needed (Found, 2012).
  - Competency deficits were found in a pretest of *informaticists* in a facility in the Southeast US (Pordeli, 2018).
  - Brunner et al (2017) in a 3-phase study identified the need for education and curriculum reform to reinforce eHealth capability and reduce the gap between academia and application.
  - The EU/US eHealth Work Project carried out a measure and mapping project.
    - ✓ In 2017, a Gap Analysis was conducted targeting 1000 respondents
    - ✓ 877 participants responded from the US and EU
    - ✓ Found pressing need for training particularly among nurses and physicians

## Significant Gap findings

- Lack of knowledge and skills of providers and caregivers.
- Lack of knowledge and skills of faculty and facility educators.
- Lack of healthcare manager and academic administrators' understanding and knowledge.
- Limited availability of courses and programs in facilities and academia.
- Limited quality and quantity of training materials.
  - Inability of educators and faculty to understand content and materials
  - Lack of consensus on how to teach this content
  - Inconsistent infusion of knowledge and skills

(Blake, Blake, Shaw, Thye, Varri et al, 2018; Hunter, McGonigle, & Hebda, 2013; McBride, Tietze & Fenton, 2013; Spencer, 2012)

## Additional Evidence

- Characteristics of US DNP faculty in 114 educational programs were evaluated. Only 21 schools reported that at least 50% of their faculty knew and understood TIGER competencies. (Fulton, Meek, & Walk, 2014)
- A survey of faculty teaching undergraduate nursing students in 272 CCNE accredited schools found that 86% had no TIGER training. (Roney, Westrick, Acri, Aronson & Rebesch, 2017)
- A review of 12 nursing programs in the Kansas City metropolitan area showed that only two offered a course with a focus on informatics. (Belchez, 2016)

## Competencies – We are Not alone

- [EU/US TIGER International Competency Synthesis Project](#)
- Canadian Association of School of Nursing
  - [https://www.casn.ca/wp-content/uploads/2014/12/Nursing-Informatics-Entry-to-Practice-Competencies-for-RNs\\_updated-June-4-2015.pdf](https://www.casn.ca/wp-content/uploads/2014/12/Nursing-Informatics-Entry-to-Practice-Competencies-for-RNs_updated-June-4-2015.pdf)
- Scotland
  - <https://www.nhsresearchscotland.org.uk/research-in-scotland/data>
- Australia and New Zealand
  - <https://digitalhealth.org.au/communities-of-practice/nursing-and-midwifery/>
- Ireland
  - <https://www.hisinm.ie/10-resources/12-health-informatics-training-system-hits.html>
- South America – Brazil
- China, Korea, Taiwan

## Informatics Does Not Belong in a Siloe

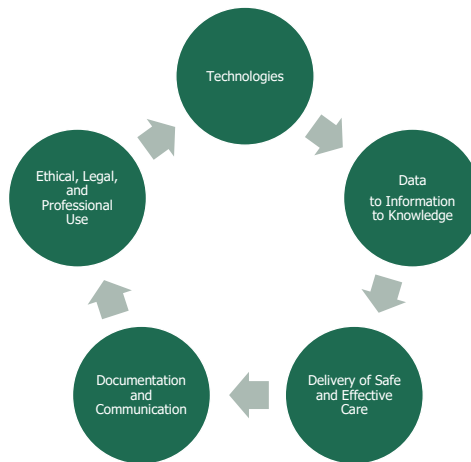
Informatics as a process and information and communications technologies are tools used everyday in every care situation.

## Some givens

- Domain 8 supports and aligns with the other Domains:
  - Knowledge for Nursing Practice
  - Person-Centered Care
  - Population Health
  - Scholarship for Nursing Practice
  - Quality and Safety
  - Interprofessional Partnerships
  - Systems Based Care
  - Professionalism
  - Personal, Professional, and Leadership Development

# ADDRESSING THE GAP: RE-ENVISIONED DOMAIN 8 COMPETENCIES

## Domain 8 - Five Interrelated Buckets



## THE RE-ENVISIONED NURSING ESSENTIALS

### • The Essentials – 2021

#### • **Domain 8: Informatics and Healthcare Technologies**

- **Descriptor:** Information and communication technologies and informatics processes are used to provide care, gather data, form information to drive decision making, and support professionals as they expand knowledge and wisdom for practice. Informatics processes and technologies are used to manage and improve the delivery of safe, high-quality, and efficient healthcare services in accordance with best practice and professional and regulatory standards.
- **Contextual Statement:** Healthcare professionals interact with patients, families, communities, and populations in technology-rich environments. Nurses, as essential members of the healthcare team, use information and communication technologies and informatics tools in their direct and indirect care roles. The technologies, the locations in which they are used, the users interacting with the technology, the communication occurring, and the work being done all impact the data collected, information formed, decisions made, and the knowledge generated. Additionally, the utilization of information and communication technologies in healthcare settings changes how people, processes, and policies interact. Using these tools in the provision of care has both short- and long-term consequences for the quality of care, efficiency of communications, and connections between team members, patients, and consumers. It is essential that nurses at all levels understand their role and the value of their input in health information technology analysis, planning, implementation, and evaluation. With the prevalence of patient-focused health information technologies, all nurses have a responsibility to advocate for equitable access and assist patients and consumers to optimally use these tools to engage in care, improve health, and manage health conditions.



## Domain 8 – Informatics and Healthcare Technologies

Entry to Professional Practice	Advanced Professional Practice
<b>8.1 Describe the various information and communication technology tools used in the care of patients, communities, and populations.</b>	
8.1a Identify the variety of information and communication technologies used in care settings.	8.1g Identify best evidence and practice processes for the application of information and communication technologies to support care processes.
8.1b Identify the basic concepts of electronic health, mobile health, and telehealth systems for enabling patient care.	8.1h Evaluate the unintended consequences of information and communication technologies on care processes, communications, and information flow across care settings.
8.1c Effectively use electronic communication tools.	8.1i Propose a plan to influence the selection and implementation of new information and communication technologies
8.1d Describe the appropriate use of multimedia applications in healthcare.	8.1j Summarize the fiscal impact of information and communication technologies on health care.
8.1e Demonstrate best practice use of social networking applications.	8.1k Appraise the impact of information and communication technologies on workflow processes and healthcare outcomes
8.1f Explain the importance of nursing engagement in the planning and selection of healthcare technologies.	

## Domain 8 – Informatics and Healthcare Technologies

<b>8.2 Use information and communication technology to gather data, create information, and generate knowledge.</b>	
8.2a Enter accurate data when chronicling care.	8.2f Generate information and knowledge from health information technology databases.
8.2b Explain how data entered on one patient impacts public and population health data.	8.2g Evaluate the use of communication technology to improve consumer health information literacy.
8.2c Use appropriate data when planning care.	8.2h. Use standardized data to evaluate decision-making and outcomes across all systems levels.
8.2d Demonstrate the appropriate use of health information literacy assessments and improvement strategies.	8.2i Clarify how the collection of standardized data advances the practice, understanding, and value of nursing and supports care.
8.2e Describe the importance of standardized nursing data to reflect the unique contribution of nursing practice.	8.2j Interpret primary and secondary data and other information to support care.

## Domain 8 – Informatics and Healthcare Technologies

### 8.3: Use information and communication technologies and informatics processes to deliver safe nursing care to diverse populations in a variety of settings.

8.3a Demonstrate appropriate use of information and communication technologies.	8.3g Evaluate the use of information and communication technology to address care needs, gaps, and inefficiencies.
8.3b Evaluate how decision support tools impact clinical judgment and safe patient care.	8.3h Formulate a plan to influence decision making processes for selecting, implementing, and evaluating support tools (e.g. clinical alerts and reminders, critical pathways, web-based clinical practice guidelines, etc.)
8.3c Use information and communication technology in a manner that supports the nurse-patient relationship.	8.3i Appraise the role of information and communication technologies in engaging the patient and supporting the nurse-patient relationship.
8.3d Examine how emerging technologies influence healthcare delivery and clinical decision making.	8.3j Evaluate the potential uses and impact of emerging technologies in healthcare.
8.3e Identify impact of information and communication technology on quality and safety of care.	8.3k Apply strategies to reduce inequities in digital access to data and information for vulnerable populations.
8.3f Identify the importance of reporting system processes and functional issues (e.g. error messages, mis-directions, device malfunctions, etc.) according to organizational policies and procedures.	

## Domain 8 – Informatics and Healthcare Technologies

### 8.4 Use information and communication technology to support documentation of care and communication among providers, patients, and all system levels.

8.4a Explain the role of communication technology in enhancing clinical information flows.	8.4e Assess best practices for the use of advanced information and communication technologies tools to support patient and team communications.
8.4b Describe how information and communication technology tools support patient and team communications.	8.4f Employ electronic health, mobile health, and telehealth systems to enable quality and efficient patient care.
8.4c Identify the basic concepts of electronic health, mobile health and telehealth systems in enabling patient care.	8.4g Evaluate the impact of health information exchange, interoperability, and integration support patient centered care.
8.4d Explain the impact of health information exchange, interoperability, and integration on health care.	

## Domain 8 – Informatics and Healthcare Technologies

<b>8.5 Use information and communication technologies in accordance with ethical, legal, professional and regulatory standards, and workplace policies in the delivery of care.</b>	
<b>8.5a Identify common risks associated with using information and communication technology.</b>	8.5g Apply risk mitigation strategies to reduce misuse of information and communication technology.
<b>8.5b Demonstrate ethical use of social networking applications.</b>	8.5h Assess potential ethical and legal issues associated with the use of information and communication technology.
<b>8.5c Comply with legal and regulatory requirements while using communication and information technologies.</b>	8.5i Recommend strategies to protect health information when using communication and information technology.
<b>8.5d Educate patients on their rights to access, review, and correct personal data and medical records.</b>	8.5j Promote patient engagement with their personal health data.
<b>8.5e Discuss how clinical judgement and critical thinking must prevail in the presence of information and communication technologies.</b>	8.5k Advocate for policies and regulations that support the appropriate use of technologies impacting health care.
<b>8.5f Deliver care using remote technology.</b>	8.5l Analyze the impact of federal policy and regulation on health data and technology in care settings.

## Strategies Used – Pros and Cons

- Individual informatics courses
- Modules added into other existing courses
- Unfolding Case Study used in existing courses
- Exemplars from the HIMSS EU US eHealth Work Project
  - Case Study: Integration of Health Informatics in Nursing Curriculum
    - VIA University College, Denmark
    - <https://www.himss.org/resources/integration-health-informatics-nursing-curriculum-case-study>
  - Case Study: Nursing Informatics and eHealth: Core Competencies for Registered Nurses in Need of Development
    - Dalarna University, Sweden
    - <https://www.himss.org/resources/nursing-informatics-and-ehealth-core-competence-registered-nurses-need-development-case>
  - Case Study: Preparing Undergraduate and Postgraduate Nurses, Midwives, and Allied Health Professionals to be Digitally Competent
    - Sheffield Hallam University, UK
    - <https://www.himss.org/resources/preparing-undergraduate-and-postgraduate-nurses-midwives-and-allied-health>

## Current Resources

- Faculty Development and Resources
  - AACN Toolkit
  - Nursing Knowledge Big Data Initiative – Education Working Group
    - <http://www.nursingbigdata.org>
  - HIMSS TIGER
    - Virtual Learning Environment
      - <https://www.himss.org/what-we-do-Initiatives-tiger/virtual-learning-environment>
    - Informatics Resources for Nurse Educators
  - AMIA NIWG
    - <https://amia.org/communities/nursing-informatics>
  - ANIA
    - <https://www.ania.org>
- Curricular support
  - Office of the National Coordinator
    - <https://www.healthit.gov/topic/health-it-resources>

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