National Nursing Informatics Deep Dive Program

What is Nursing Informatics and Why is it Important?

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Driven to Discover℠
Disclosure

I have no relevant financial interest to disclose nor am I endorsing any commercial products identified in this presentation.
Objectives

• Discuss “why informatics”?
• Examine national transformation initiatives, including the Triple Aim, Learning Health System, knowledge generating infrastructure, & interprofessional initiatives.
• Describe “what is informatics” and integration with nursing’s mission.
Why does today matter?
• 8 Recommendations Supporting 4 Key Messages

• Nurses should practice to the full extent of their education and training.
• Nurses should achieve higher levels of education and training through an improved education system that promotes seamless academic progression.
• Nurses should be full partners, with physicians and other health care professionals, in redesigning health care in the United States.
• Effective workforce planning and policy making require better data collection and information infrastructure.
TRIPLE AIM

VALUE = ACCESS + QUALITY + SECURITY

Healthy Communities
(Prevention and Wellness)

Primary Care
(Patient-Centered Medical Home)

Per Capita Cost
The Vision
Continuous Learning, Best Care, Lower Cost

BEST CARE AT LOWER COST
The Path to Continuously Learning Health Care in America

Sept 2012
iom.edu/bestcare
7 Characteristics of continuously Learning Healthcare System

• Science and informatics

1. Real-time access to knowledge. The system continuously and reliably captures, curates and delivers the best available evidence to guide and improve clinical decision-making and healthcare safety and quality.

2. Digital capture of the care experience. The system captures the care experience on digital platforms for real-time generation and application of knowledge for care improvement.

• Patient-clinician relationships

• 3. Engaged, empowered patients. The system focuses on patient needs and perspectives and promotes the inclusion of patients, families and other caregivers as vital members of the continuously learning care team.
7 Characteristics of continuously Learning Healthcare System

• **Incentives**
  • 4. **Incentives aligned for value.** The system actively aligns incentives to encourage continuous improvement, identify and reduce waste and reward high-value care.
  • 5. **Full transparency.** The system systematically monitors the safety, quality, processes, prices, costs and outcomes of care, and makes information available for care improvement and informed choices and decision-making by clinicians, patients and their families.

• **Culture**
  • 6. **Leadership-instilled culture of learning.** The system has leadership committed to a culture of teamwork, collaboration and adaptability in support of continuous learning as a core aim.
  • 7. **Supportive system competencies.** The system constantly refines complex care operations and processes through ongoing team training and skill building; systems analysis and information development; and creation of the feedback loops for continuous learning and system improvement.
Federal Health IT Strategic Plan 2011-2015

coordinated strategy between the public and private sector to improve the quality, efficiency, safety and patient-centeredness of health care through use of information and technology.

Goal I: Achieve Adoption and Information Exchange through Meaningful Use of Health IT

Goal II: Improve Care, Improve Population Health, and Reduce Health Care Costs through the Use of Health IT

Goal III: Inspire Confidence and Trust in Health IT

Goal IV: Empower Individuals with Health IT to Improve their Health and the Health Care System

Goal V: Achieve Rapid Learning and Technological Advancement
“Meaningful Use of Meaningful Use”

Transform health care

Improved population health
Enhanced access and continuity
Data utilized to improve delivery and outcomes
Data utilized to improve delivery and outcomes
Patient self management
Patient engaged, community resources
Patient centered care coordination
Team based care, case management
Registries for disease management
Registries to manage patient populations
Privacy & security protections
Privacy & security protections
Privacy & security protections
Privacy & security protections

Utilize technology

Access to information

Basic EHR functionality, structured data
Privacy & security protections
Structured data utilized
Privacy & security protections
Care coordination
Privacy & security protections
Evidenced based medicine
Privacy & security protections
Registries to manage patient populations
Privacy & security protections
Registries for disease management
Privacy & security protections
Patient informed
Privacy & security protections
Care coordination
Privacy & security protections
Patient self management
Privacy & security protections

Stage 1 MU
Stage 2 MU
PCMH 3-Part Aim
ACO’s “Stage 3 MU”
Evidence & Knowledge Generating Infrastructure

NIH transformation
Clinical and Translational Science Awards (CTSAs)

• Program creates a definable academic home for clinical and translational research.
• CTSA institutions work to transform the local, regional, and national environment to increase the efficiency and speed of clinical and translational research across the country
Layers of Context

(AHRQ Clinical Community Relations Measures Atlas, 3/2012)
The Nexus

Creating the Transformational Nexus for Health

Improved Health and Community Outcomes
National Aims / Triple Aim

The Nexus:
Collaborative linking of academia and the practice of health care.

Team-based Care

Health Professions Education
Orientation and essential skills

Senior Leadership
Faculty, Clinicians, and Practitioners
Operations

Practice Community
Evolving integrated health systems

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Synergy of:

Triple Aim
Learning Health System
Knowledge generating infrastructure
Interprofessional initiatives
• Biomedical informatics (BMI) is the interdisciplinary field that studies and pursues the effective uses of biomedical data, information, and knowledge for scientific inquiry, problem solving, and decision making, motivated by efforts to improve human health.
Biomedical Informatics: Corollaries to the Definition

1. BMI develops, studies and applies theories, methods and processes for the generation, storage, retrieval, use, and sharing of biomedical data, information, and knowledge.

2. BMI builds on computing, communication and information sciences and technologies and their application in biomedicine.
3. BMI investigates and supports reasoning, modeling, simulation, experimentation and translation across the spectrum from molecules to populations, dealing with a variety of biological systems, bridging basic and clinical research and practice, and the healthcare enterprise.

4. BMI, recognizing that people are the ultimate users of biomedical information, draws upon the social and behavioral sciences to inform the design and evaluation of technical solutions and the evolution of complex economic, ethical, social, educational, and organizational systems.
Biomedical Informatics in Perspective

Basic Research

Biomedical Informatics Methods, Techniques, and Theories

Biomedical Informatics ≠ Bioinformatics

Applied Research And Practice

Bioinformatics

Imaging Informatics

Clinical Informatics

Public Health Informatics
Interdisciplinary Nature of Biomedical Informatics

- Cognitive Science & Decision Making
- Management Sciences
- Clinical Sciences
- Basic Biomedical Sciences
- Computer Science (hardware)
- Computer Science (software)
- Bioengineering
- Epidemiology And Statistics
Biomedical Informatics in Perspective

Biomedical Informatics ≠ Health Informatics

Basic Research

Applied Research And Practice

Biomedical Informatics Methods, Techniques, and Theories

Bioinformatics

Imaging Informatics

Clinical Informatics

Public Health Informatics

Molecular and Cellular Processes

Tissues and Organs

Individuals (Patients)

Populations And Society
An Envisioned Cycle That Ties Patient Care with Knowledge Creation and Dissemination

- Providers Caring for Patients
  - Electronic Health Records
  - Regional and National Public Health and Disease Registries
  - Standards for Prevention and Treatment
  - Biomedical and Clinical Research
  - Information, Decision-Support, and Order-Entry Systems
  - Creation of Protocols, Guidelines, and Educational Materials

A “Learning Healthcare System”
LIFE in the year 2100

[THE WEEK, April 8 2011, Vol 11, Issue 509; Physics of the Future by Michio Kaku]

1900 – life expectancy 40, farmers (no internet, airplanes, TV, computer)
Methods – Interviews of 300 top world scientists

Findings:

- Internet in your contact lenses
- No computers, cell phones, clocks, watches, MP3s
- Cars – driver-less, use GPS, cushion of magnetism
- Grow spare parts for organs as they wear out
- Aging slowed down, expanded human life span
- Molecular “smart bombs” circulating to kill cancer cells
- Toilets & BR mirrors contain DNA sensors to detect Ca cells, clothes with sensors
- Growth of robots
- Tourism into outer space
- Advanced dangers of biological warfare, global warming (computer chip industry cease)
Higher Education Challenges of the 21st Century

- Improve internal democracy (ethics, autonomy, responsibility, anticipation)
- Changes in knowledge creation (interdisciplinary & transdisciplinary)
- Changes in the educational model (more active, connected to real life, designed with students and their unique qualities in mind)
- Tapping the potential of information and communication technologies in the creation and dissemination of knowledge (digital wisdom)
- Changes for social responsibility and knowledge transfer

http://www.guninetwork.org/resources/he-articles/the-challenges-of-higher-education-in-the-21st-century#sthash.rEU5yH.dpuf
Future Work Skills 2020

• 1 Sense-making
• 2 Social intelligence
• 3 Novel & adaptive thinking
• 4 Cross-cultural competency
• 5 Computational thinking
• **Definition:** ability to translate vast amounts of data into abstract concepts and to understand data-based reasoning

Future Work Skills 2020

• 6 New-media literacy
  • Definition: ability to critically assess and develop content that uses new media forms, and to leverage these media for persuasive communication

• 7 Transdisciplinarity
  • Definition: literacy in and ability to understand concepts across multiple disciplines

• 8 Design mindset
  • Definition: ability to represent and develop tasks and work processes for desired outcomes
Future Work Skills 2020

- 9 Cognitive load management
  - Definition: *ability to discriminate and filter information for importance, and to understand how to maximize cognitive functioning using a variety of tools and techniques*

- 10 Virtual collaboration
  - Definition: *ability to work productively, drive engagement, and demonstrate presence as a member of a virtual team.*
Society’s Call for Nursing’s Leadership

• Transform our health care system
• Extraordinary possibilities for nursing
• Era of big data, massive databases of health information
  • electronic health records systems
  • health repositories
  • genomics resources
  • mobile computing
  • social media archives
• Power of predictive and visualization analytics to:
  • ascertain patterns & trends
  • provide evidence that will guide patient care & care management, risk management, patient satisfaction, and decision support
• Support solutions for practice, scholarship, and management
• Effective stewardship and socially responsible engagement
• Context of polarity and partnerships.
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