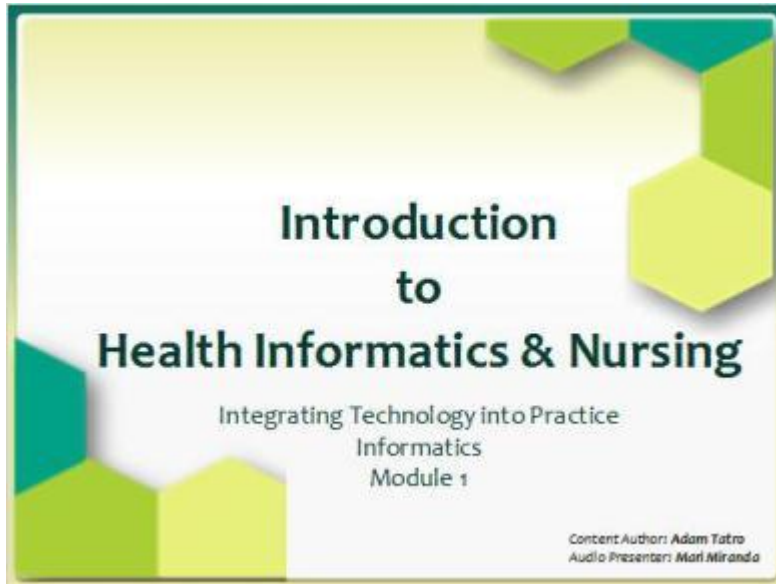


Informatics

Introduction to Health Informatics

1.1 Introduction to Health Informatics and Nursing



Notes:

Content Author: Adam Tatro

Audio Presenter: Mari Miranda

1.2 The Future Vision of Healthcare



1.3 Introduction

A screenshot of a presentation slide titled "Introduction". The slide features four small images: a person using a tablet, a hand holding a syringe, a person using a tablet, and a hand holding a pen over a document. Below the images is a list of five bullet points.

- What are Informatics, Health Informatics and Nursing Informatics? What are the differences between them and how are they related?
- Which organizations are active in Informatics and are specific to nursing?
- What is the nurse's role within Health Informatics?
- How do nurses fit into Health Informatics?
- Why should nurses be involved?

Notes:

The video that you just watched is a glimpse into a future where information is readily transmitted in real time from patient to researcher to provider to patient in a seamless fashion using technology. This flow of information, technology, and its potential use is the basis for the field of Informatics.

Welcome to the Introduction to Health Informatics and Nursing . This module will answer the following:

What are Informatics, Health Informatics, and Nursing Informatics?

What are the differences between them and how are they related?

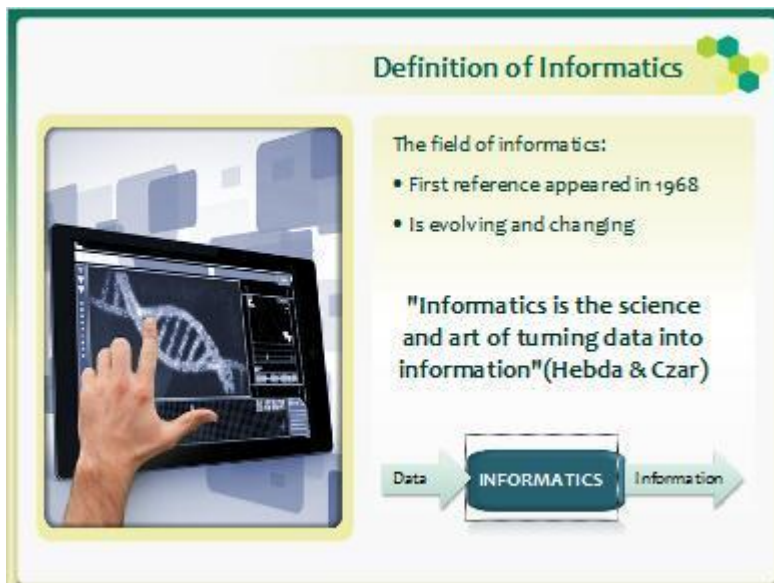
Which organizations are active in Informatics and are specific to nursing?

What is the nurse's role within Health Informatics?

How do nurses fit into Health Informatics and why should nurses be involved?

Towards the end of the module we will briefly explore how this information can be integrated into a curriculum.

1.4 Definition of Informatics

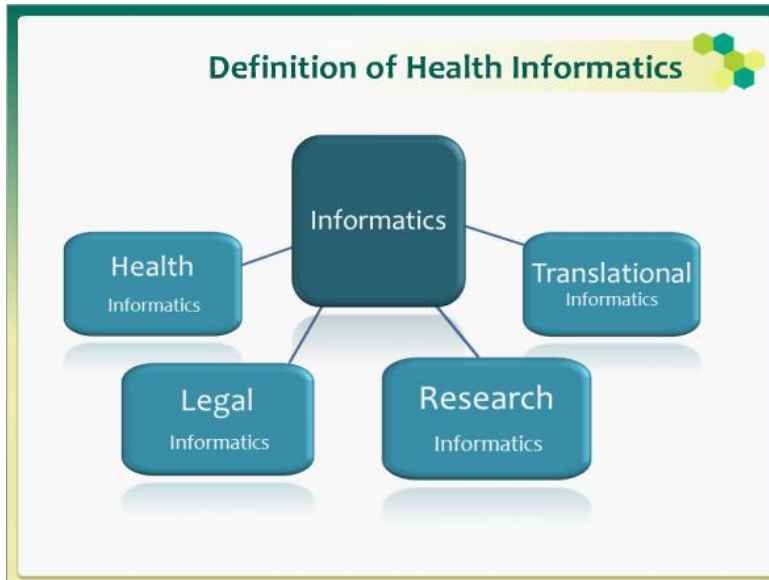


Notes:

The field of Informatics is relatively young with its first reference not appearing until 1968. As with any young field, it is evolving and changing. As part of that evolution, the scope, definitions, and terminology used is evolving with it. There are many different definitions of Informatics, however the most simplistic definition offered by Hebda & Czar is that Informatics is the science and art of turning

data into information. So Informatics is taking data and turning it into information that can be used.

1.5 Definition of Health Informatics

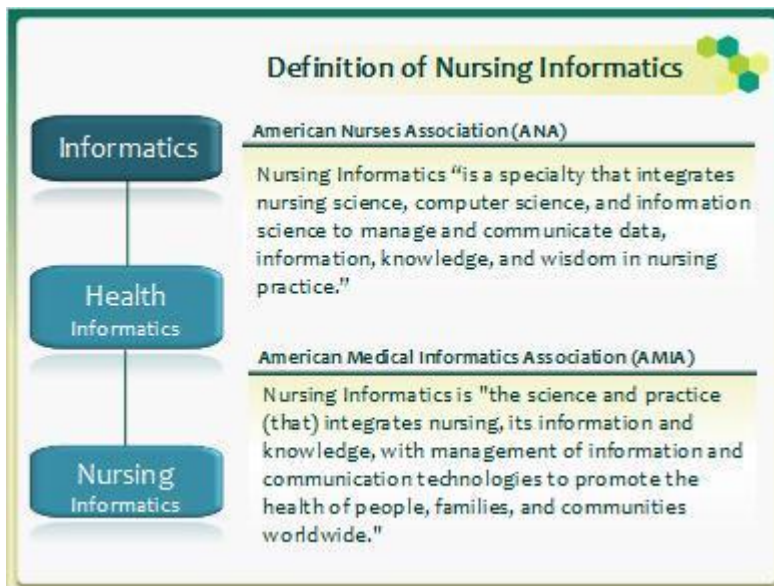


Notes:

Within Informatics there are several different levels; including Translational Informatics, Research Informatics, Legal Informatics, and Health Informatics. It is the latter that we are concerned with.

While there are several different definitions of Health Informatics, the National Library of Medicine states that Health Informatics is "the interdisciplinary study of the design, development, adoption and application of IT-based innovations in healthcare services delivery, management and planning." Health Informatics is concerned with taking information generated from data and applying it to all aspects of healthcare.

1.6 Definition of Nursing Informatics



Notes:

To recap, we have Informatics at the highest level with Health Informatics as a subgroup of Informatics. So where does Nursing Informatics come into play?

Within the field of Health Informatics is the sub group of Nursing Informatics. Once again there are several different definitions of Nursing Informatics, with two of the most popular coming from the American Nurses Association or the ANA, and the American Medical Informatics Association or the AMIA.

The ANA defines Nursing Informatics as "a specialty that integrates nursing science, computer science, and information science to manage and communicate data, information, knowledge, and wisdom in nursing practice." (ANA Practice Scope and standards of Practice for Nursing Informatics 2008, P1.)

The AMIA states that 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." (IMIA Special Interest Group on Nursing Informatics 2009)

You can see that the definitions are worded differently, but the concept is the same. The basic idea is

that Nursing Informatics is the infusion of information, knowledge, data, technology, and nursing. Nursing Informatics is the generation of information and knowledge through technology to enrich and enhance all aspects of nursing. So how is this accomplished in nursing? Let us now review how nurses fit into Informatics.

1.7 A Nurse's Role in Health Informatics



Notes:

Nurses really intersect at both the Health Informatics and Nursing Informatics level. As stated in both definitions from the ANA and the AMIA, Nursing Informatics is concerned with the management and communication of information and knowledge. Let's first take a look at what information and knowledge are.

Data is the building block in all of informatics. Without data, information cannot be generated and knowledge cannot be formed. Nurses provide data in many different ways. Nurses collect numerical data through recording and entering vital signs, ECG analyses, Intake and Output, and other clinical information. Nurses also obtain data from patients, families, and other healthcare team members which is also recorded. Nurses generate data through assessments, notes, and planning.

Nurses utilize this data to generate information. Nurses do this by reviewing real time data from a Clinical Information system for trends, by integrating data from different information systems, such as lab and radiology systems, to determine patterns, by aggregating data across patients to determine individual and population trends, or by creating case studies for staff education. These are but a few examples of how nurses generate information.

Once this information has been generated it is then synthesized into knowledge, which is used to evaluate and initiate intervention. When a nurse evaluates a trend in lab values that then leads to an intervention it is considered knowledge.

Wisdom is then the culmination of this process, where the knowledge is applied appropriately.

1.8 Definitions

Data, Information, Knowledge and Wisdom

Data

Information

Knowledge

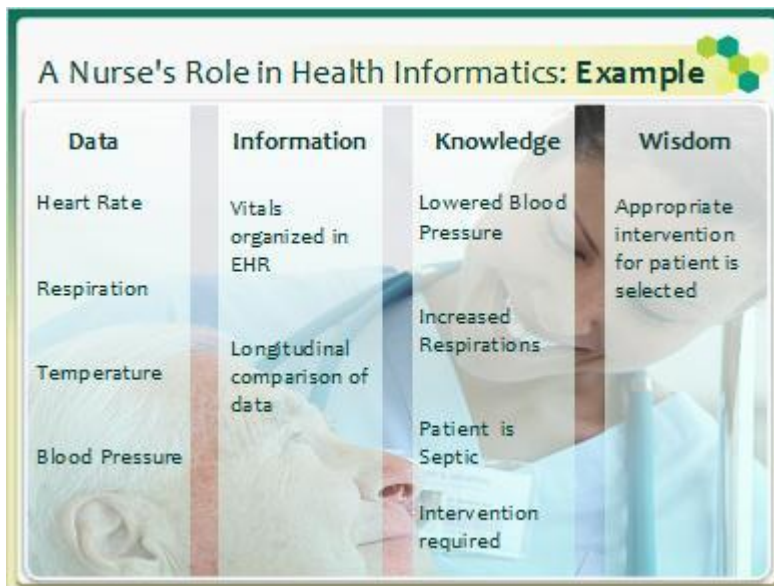
Wisdom

Graves and Corcoran (1989) derived a model that contained three elements; Data, Information and Knowledge. Nelson (2002) furthered this work by incorporating a fourth element, Wisdom.

Review the definition for each element by selecting the labeled buttons provided on the left.

Notes:

1.9 Example



Notes:

This example will illustrate the four elements. Let us begin with a nurse who enters in vitals for a patient including heart rate, respiration, temperature, and blood pressure; these are all pieces of data. When several sets of these vitals are organized, such as in an Electronic Health Record, and are longitudinally compared, this is considered information. From this comparison, the nurse may recognize that over time the blood pressure has dropped and the respirations have increased; a trend that is abnormal for the patient. The nurse may then determine that the patient is septic and needs intervention; this is considered knowledge. The nurse then decides on the intervention that is most appropriate for this patient; this is considered wisdom.

1.10 Knowledge Check



1.11 Knowledge Check

(Multiple Choice, 10 points, 1 attempt permitted)



Feedback when correct:

That's right! You selected the correct response.

Feedback when incorrect:

Part II is the correct response. See below.

INFORMATION: The nurse then reviews the urine output over the past 24 hours and notices that the patient's urine output has been decreasing over the past 24 hours.

Notes:

Consider the following scenario and identify which part provides the best example of the element Information.

A nurse measures the urine output on his patient and enters in the amount into an Electronic Health Record.

The nurse then reviews the urine output over the past 24 hours and notices that the patient's urine output has been decreasing.

The patient's record also shows that he has heart failure.

The nurse determines that the patient might need some fluid and contacts the provider.

The nurse receives an order for fluid and determines that the patient should receive the fluid slowly because of the heart failure.

The nurse retrieves the fluid and scans the bar code before administering it to the patient.

Click on the images below to review parts of the scenario.

1.12 Knowledge Check

(Multiple Choice, 10 points, 1 attempt permitted)

Q Consider Part V of the previous scenario. Which element does it best represent?



Part V

The nurse receives an order for fluid and determines that the patient should receive the fluid slowly because he has heart failure.

☒ Wisdom ☐ Data ☐ Knowledge

i Click on an image below to review a part of the scenario.

Part I	Part II	Part III	Part IV	Part V	Part VI
					

Feedback when correct:

That's right! You selected the correct response.

Feedback when incorrect:

Wisdom is the correct response.

Notes:

Here is an excerpt from the previous scenario. Which element does it best represent?

1.13 A Part of a Team



Notes:

Nurses are but one part of a team that is centered on the patient. In this new age of technology and information, with the advent of Personal Health Records and the Internet, a patient has a more active role in his health care. Along with nurses, other healthcare team members are also interacting with the four elements to provide care for the patient. Others are entering in data, such as social workers and therapists. Information and knowledge are being generated and formed by providers from the available data. The whole team is sharing its wisdom to provide care. In addition, data is being shared with patients through their Personal Health Records. Patients are then generating their own information and knowledge with the Internet. Nurses, along with other healthcare team members, need to help patients synthesize this information and guide the formation of knowledge and wisdom.

1.14 Nurses and Informatics



Notes:

As we can see, nurses intersect with Health and Nursing Informatics at many levels. As a result of this interaction, nurses need to be involved for many reasons. Let us review one example of Nurse involvement. . Nurses are being asked more and more to enter data into some kind of electronic system, such as an Electronic Health Record. As one of the largest, if not the largest, users of these systems, nurses must be involved in the design and implementation of such systems. Systems that are designed without nursing input can significantly impact nurse performance and efficiency. There have been instances of systems that have increased nursing documentation by 5 times due to poor design.

In addition to decreased speed and efficiency, a poorly designed system can lead to an increase in potential errors. Systems that are too complex can cause incorrect documentation, lack of reviewing information due to frustration or inability to find specific information, and aversion to using the system. For example, if a system has been designed to display some information in some places and other information in other places, there is an increased chance of important information not being seen, potentially placing the patient at risk or increasing the chance for error.

1.15 Nurses and Informatics

Nurses and Informatics



Areas that require nurse involvement:

- Ethical considerations
- Policy decisions
- Patient advocacy
- System use
- System training

Nurses will need to play leading roles in the use, design, and implementation of Health and Nursing informatics.

Notes:

Besides being active in the design of systems, there are other aspects that require nursing involvement. Ethical considerations, policy decisions, patient advocacy, use of such systems and system training all require a voice from nursing. As the fields of Health and Nursing informatics increase and grow, nurses will need to play leading roles in the use, design, and implementation of informatics.

More information on nursing and informatics is provided in the Resource section of this module.

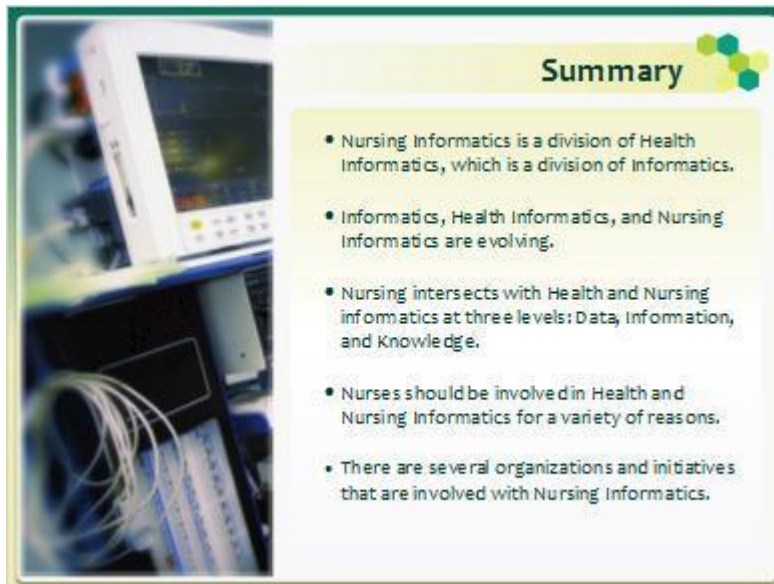
1.16 Organizations Relevant to Informatics



Notes:

As these fields of Informatics, Health Informatics, and Nursing Informatics evolve, it will be important to review the most current definitions, competencies, and information for each level. There are several different organizations and initiatives that can provide up to date information on what is occurring in all three levels of Informatics. Some of these organizations include ANA, NLN, HIMSS, AMIA, the T.I.G.E.R and QSEN initiatives. Links for these organizations are listed here and are also listed on the Resource page.

1.17 Summary



Notes:

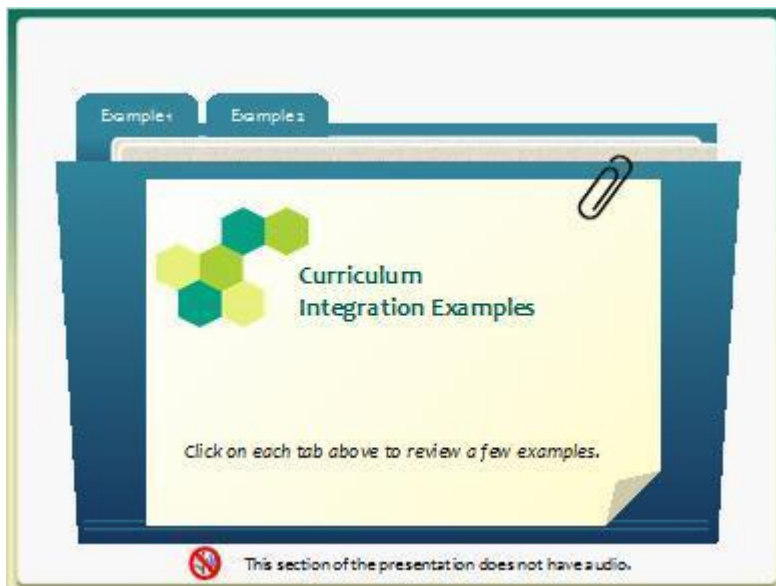
To summarize:

- Nursing Informatics is a division of Health Informatics, which is a division of Informatics
- Informatics, Health Informatics, and Nursing Informatics are evolving
- Nursing intersects with Health and Nursing informatics at three levels: Data, Information, and Knowledge level
- Nurses should be involved in Health and Nursing Informatics for a variety of reasons including design and workflow considerations
- There are several organizations and initiatives that are involved with Nursing Informatics
- There are several theories that support the use of Nursing Informatics, including: Nursing Informatics Theory, Change Theories, Rogers' Diffusion of Innovation Theory, Cognitive science and Usability, General Systems Theory, Chaos Theory, and learning theories.

1.18 Curriculum Integration



1.19 Curriculum Integration



Notes: So how can this information be integrated into your curriculum? Two possible ideas for integrating are to have student identify different examples of how nurses interact with the three elements of Nursing Informatics: Data, Information, and Knowledge. In addition, Nurse's interaction with these elements can be referenced in other classes, such as data generation during an assessment course and how that data can be used by other clinicians, or completing flowsheets during a clinical experience.

1.20 End of Presentation

