Handbook of Informatics for Nurses & Health Care Professionals, 6e **(Hebda)**
Chapter 2 Informatics Theory and Practice

1) The informatics nurse selects a middle-range theory to support a research study. Which is an advantage of using this type of theory? Select all that apply.
A) Reflects practice
B) Crosses different nursing fields
C) Focuses on a specific phenomenon
D) Differentiates between nursing and medical practice
E) Describes the broadest scope of nursing phenomenon
Answer: A, B, C
Explanation: A) Middle-range theories are more limited in scope and reflect nursing practice.
B) Middle-range theories cross different nursing fields and reflect a wide variety of nursing-care situations.
C) Middle-range theories focus on specific phenomenon and are a good fit for empirical testing.
D) Grand theories are used to differentiate between nursing and medical practice.
E) Grand theories describe the broadest scope of nursing phenomenon and relationships between them.
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Cognitive Level: Applying
Client Need & Sub: Safe and Effective Care Environment: Management of Care
Standards: QSEN Competencies: VI.A.1. Explain why information and technology skills are essential for safe patient care | AACN Essential Competencies: IV.6. Evaluate data from all relevant sources, including technology, to inform the delivery of care | NLN Competencies: Knowledge and Science | Nursing/Integrated Concepts: Assessment/Communication and Documentation
Learning Outcome: Discuss the relevance of theory for informatics research and practice.

2) The informatics nurse is leading a group of information technologists to study why a group of care providers is having difficulty documenting care provided to patients with chronic back pain. Which type of theory should the nurse use to guide this study?
A) Grand
B) Middle-range
C) Situation-specific
D) Conceptual framework
Answer: C
Explanation: A) Grand theories aim to describe the broadest scope of nursing phenomena and relationships between them and do not lend themselves to empirical testing.
B) Middle-range theories are more limited in scope, focus on a specific phenomenon, and reflect practice (teaching, clinical, or administrative). These theories cross different nursing fields and reflect a wide variety of nursing-care situations.
C) Situation-specific theories focus on a specific nursing phenomenon. They are often bound to a specific type of clinical practice and focus on a specific population. This type of theory would be the best to use with the clinical problem.
D) A conceptual framework is another name for a theory.
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Cognitive Level: Applying
Client Need & Sub: Safe and Effective Care Environment: Management of Care
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Learning Outcome: Discuss the relevance of theory for informatics research and practice.

3) The nurse reviews assessed data, determines a nursing diagnosis, and then plans interventions to address a patient's care needs. Which dimension of the theory of wisdom in action for clinical nursing did the nurse implement?
A) Wisdom
B) Knowledge
C) Person-related factors
D) Environment-related factors
Answer: B
Explanation: A) Wisdom in action requires knowledge mastery when dealing with uncertain or stressful situations. Knowledge impacts, and insight and intuition influence, the clinical judgment in context of the situation. The judgment leads to a care decision. After a care decision is applied, reflection and discovery of meaning occur, which results in learning. Gained knowledge is integrated back into the knowledge dimension.
B) Knowledge is constructed of three different knowledge types, increasing in complexity: rich factual knowledge, rich procedural knowledge, and lifespan contextualism. Factual knowledge refers to the knowledge of nursing process and patient care. This kind of knowledge is often presented in nursing textbooks and then refined and further bolstered by continuous professional development. Procedural knowledge is made up of clinical procedures, processes, and interventions required for care. Procedural knowledge is often acquired in a specific type of setting based on the accepted norms and rules of behavior. Lifespan refers to the understanding of others as well as understanding oneself.
C) Personal factors would include simple concepts, such as nurse and/or patient age, education, marital status, and more complex concepts. Clinical factors include clinical training and experience and mentors and role models.
D) Environment-related factors affecting wisdom include setting-related and information-system factors.
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Cognitive Level: Applying
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Learning Outcome: Apply the DIKW framework to a situation in your lived experience.

4) The nurse clusters collected data according to who, what, where, and when. Which concept of the data, information, knowledge, and wisdom theory is the nurse completing?
A) Data
B) Wisdom
C) Knowledge
D) Information
Answer: D
Explanation: A) Data are the most discrete components of the DIKW framework. They are mostly presented as discrete observations with little interpretation. These are the smallest factors describing the patient, disease state, or health environment.
B) Wisdom is an appropriate use of knowledge to manage and solve human problems. Wisdom includes ethics or knowing why certain things or procedures should or should not be implemented in specific cases.
C) Knowledge is information that has been processed and organized so that relations and interactions are identified. Knowledge answers the questions of why and/or how.
D) Information might be described as data plus meaning. A meaningful clinical picture is constructed when different data points are put together and presented in a specific context. Information is a continuum of progressively developing and clustered data; it answers questions such as who, what, where, and when.
Page Ref: 23
Cognitive Level: Applying
Client Need & Sub: Safe and Effective Care Environment: Management of Care
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Learning Outcome: Apply the DIKW framework to a situation in your lived experience.

5) The nurse notes that a patient's blood pressure has been trending lower since admission. Which intervention demonstrates the nurse using information to guide nursing care? Select all that apply.
A) Measuring body temperature
B) Measuring intake and output
C) Monitoring for blood in stool
D) Monitoring for blood in urine
E) Monitoring level of consciousness
Answer: B, C, D
Explanation: A) Body temperature changes would not reflect clinical judgment in this situation.
B) Low blood pressure can be caused by low oral fluid intake or excessive urine output. Measuring intake and output reflects clinical judgment.
C) Low blood pressure can be caused by bleeding. Monitoring for blood in stool reflects clinical judgment.
D) Low blood pressure can be caused by bleeding. Monitoring for blood in urine reflects clinical judgment.
E) Monitoring level of consciousness would not reflect clinical judgment in this situation.
Page Ref: 26
Cognitive Level: Analyzing
Client Need & Sub: Safe and Effective Care Environment: Management of Care
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Learning Outcome: Examine ways that informatics may use the wisdom-in-action framework to support clinical care.

6) The nurse finds a patient unresponsive in bed. After assessing that the patient is breathing and has a pulse, the nurse raises the head of the bed and measure the oxygen saturation level. Which aspect of the wisdom-in-action framework did the nurse demonstrate?
A) Setting
B) Environment
C) Personal factor
D) Insight and intuition
Answer: D
Explanation: A) The setting is an antecedent to wisdom.
B) The environment is an antecedent to wisdom.
C) Personal factors are antecedents to wisdom.
D) The nurse assessed the patient first for breathing and circulation. Raising the head of the bed reduces intracranial pressure, which could be causing the unresponsiveness. Measuring oxygen saturation helps determine if the unresponsiveness could be caused by a low oxygen level. The nurse is demonstrating problem-solving or using knowledge and previous experience to guide actions.
Page Ref: 26
Cognitive Level: Analyzing
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Learning Outcome: Examine ways that informatics may use the wisdom-in-action framework to support clinical care.

7) A multisystem healthcare organization is adding an informatics department to the main hospital. Which subdiscipline should be added to support clinical care? Select all that apply.
A) Bioinformatics
B) Dental informatics
C) Nursing informatics
D) Medical informatics
E) Structural informatics
Answer: B, C, D
Explanation: A) Bioinformatics is often defined as studying biology by applying informatics skills to understand and organize the information associated with these molecules on a large-scale. Bioinformatics is primarily concerned with three types of data from molecular biology: macromolecular structures, genome sequences, and the results of functional genomics experimentation.
B) Dental informatics is a subdiscipline of clinical informatics. It is defined as a multi-disciplinary field that seeks to improve healthcare through the application of health-information technology and information science to dental-health delivery, information management, healthcare administration, research, and knowledge sharing.
C) Nursing informatics is a subdiscipline of clinical informatics. Nursing informatics uses nursing knowledge, along with information and communication technology to promote the health of individuals, families, and entire populations.
D) Medical informatics is a subdiscipline of clinical informatics and refers to research and practice in clinical informatics that focuses on disease and predominantly involves the role of physicians.
E) Structural informatics refers to research and practical applications concerned with representing, managing, and using information about the physical organization of the body.
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Cognitive Level: Applying
Client Need & Sub: Safe and Effective Care Environment: Management of Care
Standards: QSEN Competencies: VI.C. 4. Value nurses' involvement in design, selection, implementation, and evaluation of information technologies to support patient care | AACN Essential Competencies: IV.7. Recognize the role of information technology in improving patient care outcomes and creating a safe care environment | NLN Competencies: Context and Environment | Nursing/Integrated Concepts: Planning/Communication and Documentation
Learning Outcome: Compare and contrast the different informatics subdisciplines found within healthcare.

8) A patient asks if the genetic tests being advertised on television can be used to create specific medication to treat a health problem. Which informatics professional should the nurse contact to answer this patient's question?
A) Bioinformatics
B) Structural informatics
C) Public health informatics
D) Translational bioinformatics
Answer: D
Explanation: A) Bioinformatics is often defined as studying biology by applying informatics skills to understand and organize the information associated with these molecules on a large-scale. Bioinformatics is primarily concerned with three types of data from molecular biology: macromolecular structures, genome sequences, and the results of functional genomics experimentation.
B) Structural informatics refers to research and practical applications concerned with representing, managing, and using information about the physical organization of the body.
C) Public-health informatics is the science of application of information technology in areas of public health, including prevention, preparedness, health promotion, and surveillance.
D) Translational bioinformatics combines applications of health informatics, bioinformatics, and structural informatics, to identify genomic and cellular mechanisms to explain and predict clinical phenomena. Translational bioinformatics develops innovative techniques for the integration of biological and clinical data to create a more personalized healthcare. The recent emergence of precision medicine, aimed at providing all individuals with access to personalized information for better health, builds heavily on translational-bioinformatics methods to develop accurate and personalized characterization of patient populations based on molecular, clinical, environmental exposures, lifestyle, and other patient information.
Page Ref: 32
Cognitive Level: Applying
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Learning Outcome: Compare and contrast the different informatics subdisciplines found within healthcare.

9) The nurse is reviewing information about the TIGER initiative. What does this acronym represent?
A) Technology Information Grants Electronic Records
B) Technological Initiative Given Electronic Reform
C) Technology Informatics Guiding Education Reform
D) Technology Information Guiding Electronic Reports
Answer: C
Explanation: A) **TIGER Initiative (Technology Initiative Guiding Education Reform)** was developed in an attempt to bring together stakeholders in healthcare to redesign nursing education.
B) **TIGER Initiative (Technology Initiative Guiding Education Reform)** focuses on creating a vision for the future of nursing to provide safer, higher-quality care through the use of information technology.
C) **TIGER Initiative (Technology Informatics Guiding Education Reform**) was formed to advance nurses' competencies related to informatics. TIGER's primary objective was to develop a U.S. nursing workforce capable of using electronic health records to improve the delivery of healthcare. The TIGER initiative brought together nursing stakeholders to develop a shared vision, strategies, and specific actions for improving nursing education, practice, and the delivery of patient care through the use of health-information technology.
D) **TIGER Initiative (Technology Informatics Guiding Education Reform)** requires informatics competencies for every nurse and active involvement in advancing health information technology.
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Cognitive Level: Understanding
Client Need & Sub: Safe and Effective Care Environment: Management of Care
Standards: QSEN Competencies: VI.A.1. Explain why information and technology skills are essential for safe patient care | AACN Essential Competencies: IV.7. Recognize the role of information technology in improving patient care outcomes and creating a safe care environment | NLN Competencies: Context and Environment | Nursing/Integrated Concepts: Assessment/Communication and Documentation
Learning Outcome: Weigh how the scope of informatics practice determines the types and levels of competencies needed.

10) The manager is reviewing informatics competencies for each level of staff nurse. Which statement indicates the appropriate level of informatics competencies to the correct nurse?
A) An informatics nurse extrapolates data to develop a best practice model for indwelling catheter care.
B) The novice nurse uses a spreadsheet to document medication reactions.
C) An experienced staff nurse creates databases.
D) A beginning nurse utilizes the Internet to integrate multidisciplinary languages.
Answer: A
Explanation: A) An informatics innovator is expected to be educationally prepared to conduct informatics research and generate informatics theory and have advanced understanding and skills in information management and computer technology.
B) A beginning nurse is expected to have fundamental information management and computer-technology skills and use existing information systems and established information-management practices.
C) An experienced nurse is expected to have a specific area of expertise, be skilled in using information management and computer technology, have strong analytic skills to learn from relationships between different data elements, and be able to collaborate with the informatics nurse specialist to suggest improvement to systems. Database creation is beyond the skill level of the experienced nurse.
D) Beginning nurses are comfortable with basic skills and should be able to retrieve information from the system, as well as interpret data. An experienced nurse is prepared to use the Internet to integrate multidisciplinary languages.
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Learning Outcome: Weigh how the scope of informatics practice determines the types and levels of competencies needed.

11) The manager plans to hire a new nurse who has just graduated from nursing school. Which informatics activity should this nurse be able to perform?
A) Attain informatics nurse certification within six months of beginning practice.
B) Input vital signs and intake and output data in the electronic medical record.
C) Utilize the Internet to review trends in healthcare information technology.
D) Use an electronic spreadsheet to create staffing rotations.
Answer: B
Explanation: A) Inputting data into the electronic medical record is a beginning level competency for nurses entering the profession; the other choices are at higher levels.
B) Inputting data into the electronic medical record is a beginning level competency for nurses entering the profession.
C) Inputting data into the electronic medical record is a beginning level competency for nurses entering the profession. Using the Internet is a higher level of competency.
D) Novice nurses do not have the computer literacy skills to employ a spreadsheet to create schedules. This is a more advanced competency. The novice nurse is beginning to learn to use the system to input data.
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Cognitive Level: Applying
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Learning Outcome: Weigh how the scope of informatics practice determines the types and levels of competencies needed.

12) The information technology department in a multisystem healthcare organization establishes the goal of improving the use of technology with patient care. Which action item should the departmental members plan to implement? Select all that apply.
A) Practice
B) Visibility
C) Cost containment
D) Quality improvement
E) Education and training
Answer: A, B, E
Explanation: A) Based upon a survey conducted about future trends in nursing informatics, practice is identified as an area in which to advance nursing informatics in the next 5 to 10 years.
B) Based upon a survey conducted about future trends in nursing informatics, visibility is identified as an area in which to advance nursing informatics in the next 5 to 10 years.
C) Based upon a survey conducted about future trends in nursing informatics, cost containment is not identified as an area in which to advance nursing informatics in the next 5 to 10 years.
D) Based upon a survey conducted about future trends in nursing informatics, quality improvement is not identified as an area in which to advance nursing informatics in the next 5 to 10 years.
E) Based upon a survey conducted about future trends in nursing informatics, education and training are identified as areas in which to advance nursing informatics in the next 5 to 10 years.
Page Ref: 37
Cognitive Level: Applying
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Learning Outcome: Discuss future needs and directions for nursing informatics.

13) A multisystem healthcare organization placed questionnaires within every patient's personal portal. Which type of data is being collected?
A) Big
B) Medical
C) Personal
D) Situational
Answer: A
Explanation: A) Big data is a recent term referring to large, unstructured datasets that are becoming increasingly available in health-related domains.
B) These data are not medical in nature.
C) Although the questionnaire is placed in a personal portal, the data are not considered personal.
D) Situational is not a type of data.
Page Ref: 37
Cognitive Level: Applying
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