Curriculum Development Centers Program

Awardee of The Office of the National Coordinator for Health Information Technology

HEALTH IT WORKFORCE CURRICULUM
COMPONENT BLUEPRINT
Version 3.0/Spring 2012

Component Number: 7
Component Name: Working with Health IT Systems

Component Description: A laboratory component. Students will work with simulated systems or real systems with simulated data. As they play the role of practitioners using these systems, they will learn what is happening "under the hood." They will experience threats to security and appreciate the need for standards, high levels of usability, and how errors can occur. Materials must support hands-on experience in computer labs and on-site in health organizations.

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Team Members: Robert Kolodner, MD, FAMCI
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Workforce Roles: Clinician/ Practitioner Consultant, Implementation Support Specialist and Technical/ Software Support

Component Objectives
At the completion of this component, the student will be able to:
1. Identify common components of an HIT system and types of HIT applications (E-Mar, POE, PACS, ADT, Lab, DSS, Registries, Billing/Coding, etc, and acute care, community health, public health, small provider practices, etc.)
2. Describe data flows across HIT systems and implication of standards.
3. Identify root causes of HIT-induced error (i.e. usability, workflow interference, system error, etc.) and suggest solutions.
4. Assess the strengths and weaknesses of identified solutions to identified HIT problems (to emphasize the reality of "solutions" and illustrate the frequent domino effect/unintended consequences of change of an HIT system)
5. Defines usability, describes general usability principles, and relates usability to adoption in relation to HIT.

This material was developed by Johns Hopkins University, funded by the Department of Health and Human Services, Office of the National Coordinator for Health Information Technology under Award Number IU24OC000013.

6. Define and differentiate security, confidentiality, and privacy and identify common threats.
7. Demonstrate beginning level competency in general HIT system use

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Component Units with Objectives and Topics

Unit 1 Introduction & Overview: Components of HIT Systems

Description:
Unit 1 is an introductory unit where the core definitions and concepts of systems in general and healthcare specifically are presented. Using hands on exploratory lab exercises, students will be introduced to an example HIT system where they will learn basic navigation and gain familiarity with components common to many clinical HIT systems. Specific examples of HIT systems from a variety of settings will be discussed.

Objectives:
1. Define a system and relate systems concepts to HIT
2. Discuss specific examples of settings where Health IT is used (acute, rural, public health, clinic, office, patient home, etc.)
3. Identify common components of a clinical HIT system
4. Demonstrate beginning level competency in maneuvering the demonstration EHRS

Topics:
1.1 - Understanding Systems - Conceptualizing HIT Use
1.2 - HIT Systems
1.3 - Big Picture of HIT Systems
1.4 - Common Aspects of Clinical HIT Systems

Unit 2 Under the Hood: Functions of HIT Systems

Description:
Unit 2 is designed to introduce students to the generic functions of HIT systems that underpin inpatient and outpatient (ambulatory) processes. Crafted HIT lab exercises will lead the student through a complete patient encounter – both inpatient and outpatient – to highlight how HIT systems support, and sometimes thwart, information flow.

Objectives:
1. Identify the health IT functions that support a generic *ambulatory* patient care process.
2. Identify the health IT functions that support a generic *inpatient* care process.

Topics:
2.1 – Inpatient Processes Vs Ambulatory Processes: Comparing and Contrasting
2.2 – Health IT Support of Care Processes (Inpatient & Outpatient)

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Unit 3 Understanding Information Exchange in HIT Systems

Description:
Unit 3 will focus upon the functional aspects of interoperability within and between systems. Applying didactically presented concepts to hands on lab assignments, students will be challenged to locate and collate data from disparate systems, to respond to user requests for reports, and to assist users in planning for enhanced information flow in HIT systems.

Objectives:

1. Identify common elements of the HIT system.
2. Explain the need for standards and why they exist.
3. Define and differentiate between messaging standards and terminology standards. (transmission VS meaning – very basic)
4. Compare current efforts to facilitate health information exchange between providers, communities, regions, & nation. (basic level definitions/descriptions – NHIN, HIEs, etc.)

Topics:

3.1 – Types of Information Exchange
3.2 – "Meaningful Use" and HIT Information Exchange
3.3 – Types of Standards
3.4 – HIE Initiatives

Unit 4 The Effective HIT System

Description:
Unit 4 is designed to emphasize the aspects of HIT that contribute to effectiveness and meaningful use. The concepts of usability, consistency, and reliability in regards to HIT systems and how each contributes to, or detracts from, effectiveness will be presented. Definitions of evidence-based practice and guideline-enhanced care will be covered in addition to how HIT can support effective, safe, and efficient patient-centered care.

Objectives:

1. Identify characteristics of an effective HIT system.
2. Define and provide examples of how evidence-based practice can be supported in HIT Systems.
3. Define and cite examples of usability / configurability / scalability and reliability in HIT Systems.
4. List and contrast different types of reports/queries (predefined vs. ad hoc) required for internal and external reporting.

Topics:

4.1 – Effective HIT
4.2 – Characteristics of Effective HIT

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4.3 – Supporting Workflows

Unit 5 Fundamentals of Usability in HIT Systems – What Does It Matter?

Description:
Unit 5 will present the basic concepts of usability in general and HIT usability specifically. Students will be exposed to usability bottlenecks and learn to identify usability roadblocks in the EHRS lab system, hypothesizing potential downstream effects of poor usability, and suggesting solutions/alternate designs. This unit will detail the relationships between usability, user satisfaction, and workarounds.

Objectives:
1. Define usability in relation to HIT systems.
2. Explain the impact of HIT usability on user satisfaction, adoption, and workarounds in error rates or unintended consequences.
3. Provide alternatives to HIT usability bottlenecks.

Topics:
5.1 – Defining Usability
5.2 – User Centered Design
5.3 – Usability in HIT
5.4 – Impact of Poor HIT Usability
5.5 – Strategies for Bottlenecks

Unit 6 HIT Facilitated Error—Cause and Effect

Description:
Unit 6 is a unit that will focus upon error in health and healthcare that can be facilitated and propagated by HIT. Different classes of HIT errors (slips/mistakes, omission/commission) will be discussed and differentiated. Specific scenarios that create opportunities for HIT facilitated error will be presented to students in the lab exercises. In these exercises, students will apply concepts learned in the didactic portion of this unit to identify error, classify error, analyze root cause, and propose solutions.

Objectives:
1. Explain the concept of facilitated error in HIT.
2. Cite examples of situations where HIT systems could increase the potential for user error.
3. Analyze sources of HIT facilitated errors and suggest realistic solutions.

Topics:
6.1 – Error in Healthcare

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6.2 – Error Vocabulary
6.3 – Technology Induced Error

Unit 7 Protecting Privacy, Security, and Confidentiality in HIT Systems

Description:
Unit 7 is designed to present an overview of the concepts of privacy, security, and confidentiality of protected health information (PHI) in relation to HIT systems. Threats to PHI frequently encountered in HIT environments such as password sharing, offsite access to EHRS, challenges of staff turn-over and student access, unauthorized access, etc. will be detailed. Students will be exposed to simulated breeches of privacy, security and confidentiality of PHI in lab exercises, asked to identify, and propose strategies to thwart.

Objectives:
1. Explain and illustrate privacy, security, and confidentiality in HIT settings.
2. Identify common threats encountered when using HIT.
3. Formulate strategies to minimize threats to privacy, security, and confidentiality in HIT systems.

Topics:
7.1 – Administrative Safeguards
7.2 – Physical Safeguards
7.3 – Technical Safeguards

Unit 8 HIT System Planning, Acquisition, Installation, & Training: Practices to Support & Pitfalls to Avoid

Description:
Unit 8 is a unit where the core definitions and concepts of HIT systems planning, acquisition, installation and training are presented. A variety of different settings will be used as examples in the unit, including small office practices, community clinics, acute care facilities and skilled nursing facilities. Students will conduct simulated user needs analysis, and using the lab EHRS, will identify gaps in meeting those needs. Students will develop training plans for a variety of settings.

Objectives:
1. Conduct a basic user needs analysis for a given example situation
2. Create a plan for training users in a small office practice, a large community clinic, or a single unit in an ambulatory care setting.
3. Identify several potential challenges that may emerge during installation and generate a strategy to solve. (space, wiring, lack of basic computer literacy in staff, etc.)

Topics:

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8.1 – The Systems Development Process
8.2 – Business Process
8.3 – Training

Unit 9 Potential Issues with Adoption and Installation of an HIT system

Description:
The basics of human behavior, change, and adaptation will be discussed. Strategies for dealing with barriers to implementation (human and structural) will be covered.

Objectives:

1. Identify frequently encountered challenges to adoption and implementation of HIT systems
2. Design an action plan to address barriers to implementation of an HIT system.
3. Propose solutions to common problems in the implementation of HIT systems.

Topics:

9.1 – Why Systems Fail
9.2 – Critical Success Factors in HIT Adoption/Implementation
9.3 – Common Challenges
9.4 – Potential Strategies

Unit 10 HIT and Aspects of Patient-Centered Care

Description:
Patient-centered care will be defined and explained. The aspects of HIT that support (and detract) from patient-centered care will be discussed. Specific examples will be provided. Students will explore aspects of HIT that currently support patient-centered care and will propose new methods for enhancing patient-centered care.

Objectives:

1. Define patient-centered care.
2. Suggest HIT-enabled solutions/strategies to enhance patient involvement in health and healthcare
3. Assess the effectiveness of HIT systems in supporting patient-centered care.
4. Perform self-assessment of personal beliefs related to HIT and patient-centered care.

Topics:

10.1 – Patient Centered Care
10.2 – Measuring Effectiveness of Patient Centered Approaches
10.3 – Exploring an Example of HIT

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Unit 11 Health IT in the Future

Description:
This unit will focus upon future directions for HIT. New areas of research and development in HIT will be examined. Students will gain a foundational understanding of these areas and will debate appropriateness and feasibility of new HIT development areas.

Topics:
11.1 – Alternative Designs for HIT
11.2 – Infodemiology

Objectives:
1. Speculate the relationship between HIT and health reform.
2. Suggest alternative design for usable & supportive H.IT
3. Hypothesize how HIT may intersect with publicly available data to improve health (i.e. point of sale, weather, GIS, foods, etc).
4. Predict avenues of future innovations in HIT.

Unit Elements:
Instructor manual, lectures, self-assessment questions, discussion questions and/or activities, assignments and exercises

Format:
Slides with narration (voiceover PowerPoint in Flash format), suitable for lecture, team-based learning, or online independent study; lecture transcripts (MS Word documents); and audio files in mp3 format for each lecture; self-assessment and discussion questions and keys (MS Word documents).

Local Resources Required for Implementation:
Computer, Microsoft Office, PowerPoint, Flash player (free download), mp3 player (free download), Learning Management System (optional)

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