



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

Component 7: Working with Health IT Systems

Instructor's Manual

Version 3.0/Spring 2012

Notes to Instructors

This Instructor's Manual is a resource for instructors using this component. Each component is broken down into units, which include the following elements:

- Learning objectives
- Suggested student readings, texts, reference links to supplement the narrated PowerPoint slides
- Lectures (voiceover PowerPoint in Flash format); PowerPoint slides (Microsoft PowerPoint format), lecture transcripts (Microsoft Word format); and audio files (MP3 format) for each lecture

Self-assessment questions reflecting Unit Objectives with answer keys and/or expected outcomes

- Application Activities (e.g., discussion questions, assignments, projects) with instructor guidelines, answer keys and/or expected outcomes

Contents

Notes to Instructors	2
Component Overview	5
Component Authors.....	7
Disclaimer	9
Component 7/Unit 1.....	10
Component 7/Unit 2.....	13
Component 7/Unit 3.....	16
Component 7/Unit 4.....	18
Component 7/Unit 5.....	21
Component 7/Unit 6.....	25
Component 7/Unit 7.....	29
Component 7/Unit 8.....	33
Component 7/Unit 9.....	36
Component 7/Unit 10.....	39
Component 7/Unit 11	43
Component Acronym Glossary.....	46

Component Overview

Working with Health IT Systems

This is 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.

Component Units

1. Introduction & Overview: Components of HIT Systems
2. Under the Hood
3. Understanding Information Exchange in HIT Systems
4. The Effective HIT System
5. Fundamentals of Usability in HIT Systems—What Does It Matter?
6. HIT Facilitated Error—Cause and Effect
7. Protecting Privacy, Security, and Confidentiality in HIT Systems
8. HIT System Planning, Acquisition, Installation, & Training:
Practices to Support & Pitfalls to Avoid
9. Potential Issues with Adoption and Installation of an HIT system.
10. HIT and Aspects of Patient-Centered Care
11. Health IT in the Future

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

Component Authors

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David Hinton, Howard Community College

David M. Hinton is an Associate Professor at Howard Community College, where he teaches a wide range of career and transfer technology courses. He has extensive knowledge in working with certificate and career seeking students. He has taught Introduction to Computer Repair and Advanced Computer Repair. He has also designed and taught curriculum for Computer-Aided Design, Computer Game Design and Simulation, 3D Animation and Visualization. He has served as support liaison for training faculty online learning management systems. During the summer months, he teaches middle school students 3D Animation and Visualization. He has a bachelor of science in Business Information Systems.

Robert Kolodner, MD, FACMI

Robert M. Kolodner, MD is co-founder and President of Collaborative Transformations, LLC, which consults with government and non-profit organizations regarding their health IT strategies and plans. In addition, he serves as the Chief Health Informatics Officer for Open Health Tools, Inc. Dr. Kolodner brings to his current activities a wealth of experience in health IT from 31 years of federal service and leadership in two Departments—Veterans Affairs and Health and Human Services. From 2006 to April 2009, Dr. Kolodner served as the president's designated lead for the United States eHealth initiative as the National Coordinator for Health Information Technology (IT) in Office of the Secretary of the US Department of Health and Human Services (HHS). Dr.

Kolodner received his undergraduate degree from Harvard College, his medical degree from Yale University School of Medicine, and completed his psychiatric residency at the Washington University School of Medicine. Dr. Kolodner has medical specialty board certification in psychiatry and is a Fellow in the American College of Medical Informatics.

Michael Vaughn, MS, JHU School of Nursing

Michael Vaughn is currently assistant dean for information and technology integration at the Johns Hopkins University School of Nursing, and was previously an assistant dean for information systems at the Indiana University School of Nursing. He has over twelve years of experience leading the integration of technology into health education, research, and practice. In addition to overseeing the day-to-day operations of a complex IT organization and critical information systems, he has pioneered the introduction of many cutting-edge technologies into nursing education, developed innovative technologies to enhance patient education and improve health outcomes, and consulted on the design and construction of state-of-the-art clinical simulation facilities.

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Disclaimer

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Likewise, the above also applies to the Curriculum Development Centers (including Columbia University, Duke University, Johns Hopkins University, Oregon Health & Science University, University of Alabama at Birmingham, and their affiliated entities).

Component 7/Unit 1

Unit Title

Introduction & Overview: Components of HIT Systems

Unit Description

This unit 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.

Unit Objectives

By the end of this unit the student will be able to:

1. Define a system and relate systems concepts to Health IT (HIT).
2. Discuss specific examples of settings where HIT 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.

Unit Topics/Lecture Titles

- 2.1 – Understanding Systems—Conceptualizing HIT Use
- 2.2 – HIT Systems
- 2.3 – Big Picture of HIT Systems
- 2.4 – Common Aspects of Clinical HIT Systems

Unit References

(All links accessible as of 1/1/2012)

Lecture 1

1. Nationwide Health Information Network <http://www.healthit.gov/policy-researchers-implementers/nationwide-health-information-network-nwhin>
2. Google Flu Trends
<http://www.google.org/flutrends/>

*Indicates this link is no longer functional.

Lecture 1 Images

Slide 3: Venn Diagram of Healthcare. Created by Dr. Patricia Abbott.

Slide 4: Hong Kong Subway system. Courtesy of “Dear Edward’s Photostream” (Creative Commons Attribution). E. Russell (1984).

Available from: <http://www.flickr.com/photos/erussell1984/>

Slide 5: Image 1: MIT OpenCourseWare. Available from: <http://www.flickr.com/photos/mitopencourseware/3693490067/>*

Image 2: Food Service as a System. Courtesy CDC. Available from: http://www.cdc.gov/nceh/ehs/EHSNet/images/Food_Service_as_a_System.jpg*

Slide 6: Concept Overview of an Electronic Health Record—National Institutes of Health. Available from: <http://www.ncrr.nih.gov/publications/informatics/EHR.pdf>*

Slide 7: Image 1: My HealtheVet Website. Veterans Administration.

Available from: https://www.myhealth.va.gov/mhv-portal-web/anonymous.portal?_nfpb=true&_nfto=false&_pageLabel=mhvHome

Image 2: Clinician and Patient: Courtesy Dr. Patricia Abbott.

Image 3: World Health Organization. Available from: http://gamapserver.who.int/gho/interactive_charts/road_safety/road_traffic_deaths2/atlas.html.

Image 4: Girl and Patients Like Me. Courtesy Dr. Patricia Abbott.

Available from: <http://www.morguefile.com/license/morguefile/>

Slide 8: The Big Picture of Health Care. Available from: <http://healthit.hhs.gov>

Slide 9: Nurse Filing Medical Records. Courtesy U.S. Army. US Army Korea-IMCOM. Available from: <http://www.flickr.com/photos/imcomkorea/>

Slide 10: A single Record of Patient Data. Courtesy Dr. John Halamka

Slide 11: VA Vista system. Courtesy US Department of Veterans Affairs

Unit Suggested Readings

1. National Center for Research Resources. Electronic Health Records: An Overview. 2006. Available from: <http://www.ncrr.nih.gov/publications/informatics/EHR.pdf>*
2. Wager, K., Lee, F., & Glaser, J. Managing Health Care Information Systems: A Practical Approach for Health Care Executives. 2009. Available from: www.uiowa.edu/.../12052003/year.html*

Additional Materials

Computerized Patient Record System (CPRS)
User Guide

The VistA CPRS is the award-winning electronic health records system that is used by the US Department of Veterans Affairs.

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Student Application Activities

comp7_unit1_activities

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comp7_unit1_assessment

comp7_unit1_assessment_key

Additional Materials

EHR Orientation Videos (optional .swf video files)

- Part 1: Working with HIT Systems
- Part 2: Exploring the Coversheet
- Part 3: Diving Deeper into the Tabs
- Part 4: Diving Deeper into the Tabs – Part 2
- Part 5: Labs, Reports, & Starting to Scavenge
- Part 6: Scavenger Hunt (to be used with scavenger hunt activity)
The scavenger hunt can be converted into a graded assignment if desired. Extra credit questions are included in the existing scavenger hunt materials (in the event that this activity is converted to a graded assessment).

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Component 7/Unit 2

Unit Title Under the Hood

Unit 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 simulated patient encounter to highlight how HIT systems support, and sometimes thwart, information flow.

Unit Objectives

By the end of this unit the student will be able to:

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.

Unit Topics / Lecture Titles

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

Unit References

(All links accessible as of 1/1/2012)

Lecture 2a

1. Middleton, B., Gandhi, T.K., Bates, D.W. Patient Safety: The Role of Information Technology. In: Memel DS; editor(s). Effective Management of Healthcare Information: Leadership Roles, Challenges, and Solutions. Chicago, IL: Healthcare Information & Management Systems Society; 2003. Available from: <http://www.partners.org/cird/StaffPrj.asp?cBox=Pubs>
2. DesRoches C.M., Campbell, E.G., Rao, S.R., et al. Electronic health records in ambulatory care--a national survey of physicians. *N Engl J Med*. 2008 Jul 3;359(1):50-60. Available from:
3. <http://www.ncbi.nlm.nih.gov/pubmed/18565855>
4. Vincent, C. *Patient Safety*. First Edition. Elsevier, New York, 2006.

*Indicates this link is no longer functional.

Lecture 2a Images

Slide 2: Composite Image. Courtesy Dr. Patricia Abbott

Slide 3: Clinician Discusses Medical Test Results. Available from:

<http://www.flickr.com/photos/59632563@N04/6104068209/sizes/m/in/photostream/>

Attribution 2.0 Generic (CC BY 2.0)

Slide 4: Image 1—Paper Chart Pile. Courtesy Dr. Patricia Abbott

Image 2. Woman Monitoring Patient Data. Courtesy VA. Available from:

http://www.minneapolis.va.gov/features/thumbnail_photos_180x130/thumb_20110826_teleicu.jpg

Slide 5: Image 1—Army field hospital. Courtesy US Army. Available from:

<http://www.cs.amedd.army.mil/>

Image 2—Poster. Available from:

<http://www.flickr.com/photos/forumone/5520757618/sizes/m/in/%20photostream/>

Attribution-NonCommercial-NoDerivs 2.0 Generic (CC BY-NC-ND 2.0)

Slide 6: Patient Being transported. Fort Belvoir, VA—Fort Belvoir

Community Hospital. Available from: <http://www.flickr.com/photos/belvoirhospital/5863738177/sizes/m/in/photostream/>

Attribution-NonCommercial 2.0 Generic (CC BY-NC 2.0)

Slide 7: Clinician and Patient. Courtesy National Cancer Institute.

Available from: http://www.cancer.gov/PublishedContent/Images/images/documents/686dbfa4-d1fc-4a51-8801-1bfde225c2b7/ld_cost_of_care.jpg*

Slide 8: Wine Glasses. Available from: <http://www.flickr.com/photos/nickwheeleroz/2220008689/sizes/m/in/photostream>

Nick Wheeler Creative Commons Attribution-Non Commercial-ShareAlike

2.0 Generic (CC BY-NC-SA 2.0)

Lecture 2b

1. National Center for Research Resources. Electronic Health Records: An Overview. 2006. Available from: <http://www.ncrr.nih.gov/publications/informatics/EHR.pdf>*

Lecture 2b Images

Slide 2: Image 1—Man at Counter. International Institute for

Communication and Development (IICD) The Hague, Netherlands (2008)

Available from: <http://www.flickr.com/photos/iicd/5349100062/sizes/m/in/photostream/>

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Image 2. Process Diagram. Courtesy Dr. Patricia Abbott

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Slide 3: Image 1—Man at Counter. International Institute for Communication and Development (IICD) The Hague, Netherlands (2008). Available from: <http://www.flickr.com/photos/iicd/5349100062/sizes/m/in/photostream/>

Attribution 2.0 Generic (CC BY 2.0)

Image 2. Process Diagram. Courtesy Dr. Patricia Abbott

Slide 4: Image 1—Computer Screen with Patient Data. Lucas Pettinati, Brazil

Available from: <http://www.flickr.com/photos/lpettinati/3345788276/sizes/m/in/photostream/>

Attribution—NonCommercial-NoDerivs 2.0 Generic (CC BY-NC-ND 2.0)

Image 2—Process Diagram. Courtesy Dr. Patricia Abbott

Unit Suggested Readings

1. National Center for Research Resources. Electronic Health Records: An Overview. 2006. Available from: <http://www.ncrr.nih.gov/publications/informatics/EHR.pdf>
(Use Chapters 1 & 2)

Student Application Activities

comp7_unit2_activities.doc

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Component 7/Unit 3

Unit Title

Understanding Information Exchange in HIT Systems

Unit 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 and to assist users in planning for enhanced information flow in HIT systems.

Unit Objectives

By the end of this unit the student will be able to:

1. Identify entities that are commonly involved in HIT system data exchange.
2. Explain the need for standards and why they exist.
3. Define and differentiate between vocabulary, content exchange, and privacy and security standards.
4. Compare current efforts to facilitate health information exchange between providers, communities, regions, and nation (NHIN, HIEs, NHIN Direct).

Unit Topics / Lecture Titles

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

Unit References

(All links accessible as of 1/1/2012)

Lecture 3

National Alliance for HIT Report to the ONC on Defining Key Health Information Technology Terms (April 28, 2008)

Available from: http://www.hhs.gov/healthit/documents/m20080603/10_2_hit_terms.pdf*

1. National Library of Medicine HIT standards. Available from: <http://www.nlm.nih.gov/healthit.htm>*

*Indicates this link is no longer functional.

Lecture 3 Images

Slide 1: Health Care Professionals. National Cancer Institute (NCI) Rhoda Baer, Photographer.

Slide 4: Exchange. Courtesy Michael Vaughn

Slide 6: Man Moving from One City to Another with His Health Record. Created by Michael Vaughn, used with permission. Clip art obtained from <http://www.openclipart.org>

Slide 8: Communication Flow. Department of Defense. Available from: <http://jltc.fhu.disa.mil/dcr/gig.jpg>*

Slide 9: Joint Initiative Council Organization Chart. AHIMA. Available from: <http://library.ahima.org>

Slide 10: Health Information Exchange Diagram. Available from: www.ahrq.gov

Slide 11: Screen Shot of My HealtheVet. Available from: <http://www.myhealth.va.gov/>

Unit Suggested Readings

1. "What is the NHIN?" Available at: http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_10741_877368_0_0_18/WhatIsTheNHIN.pdf*
2. Simon S, Evans S, Benjamin A, Delano D, Bates D. Patients' Attitudes Toward Electronic Health Information Exchange: Qualitative Study. J Med Internet Res. 2009; 11(3):e30. Available from: <http://www.jmir.org/2009/3/e30/>
3. Bouhaddou O, Warnekar P, Parrish F, Do N, Mandel J, Kilbourne J, Lincoln M. Exchange of Computable Patient Data between the Department of Veterans Affairs (VA) and the Department of Defense (DoD): Terminology Mediation Strategy. J Am Med Inform Assoc. 2008; 15(2): 174-183. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2274797/?tool=pubmed>
4. Review the NIST (National Institute of Standards and Technology's Health Information Technology (HIT) Implementation Testing and Support web site at: <http://healthcare.nist.gov/>

Student Application Activities

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Component 7/Unit 4

Unit Title

The Effective IT System

Unit 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.

Unit Objectives

By the end of this unit the student will be able to:

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.

Unit Topics/Lecture Titles

- 4.1 – Effective HIT
- 4.2 – Characteristics of Effective HIT
- 4.3 – Supporting Workflows

Unit References

(All links accessible as of 1/1/2012)

Lecture 4

1. Crossing the Quality Chasm: A New Health System for the 21st Century. (2001). Institute of Medicine of the National Academies. Available from: <http://www.iom.edu/Reports/2001/Crossing-the-Quality-Chasm-A-New-Health-System-for-the-21st-Century.aspx>
2. Dennison J, Eisen S, Towers M, & Clark CI. (2006). An Effective Electronic Surgical Referral System. *Annals of The Royal College of Surgeons of England*. 88(6): 554-556 Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1963768/?tool=pubmed>

*Indicates this link is no longer functional.

3. Gibbons R, Antman E, & Smith S. (2010). Has guideline development gone astray? No. *British Medical Journal*, 340:c343.
4. ISO 13407. (1999). Human Centered Design Processes for Interactive Systems. Available at: http://www.iso.org/iso/catalogue_detail.htm?csnumber=21197
5. National Guideline Clearinghouse. Agency for Healthcare Research and Quality. Available from: <http://www.guideline.gov/about/about.aspx>
6. Webster L, & Shapiro R. (2010). Health information technology: A new world for pharmacy. *Journal of the American Pharmacists Association*. 2010 April; 50(2): e20-e34. Available from: <http://japha.metapress.com/openurl.asp?genre=article&id=doi:10.1331/JAPhA.2010.09170>*

Lecture 4 Images

Slide 3: U.S. Public Health Service Logo. Available from: <http://www.usphs.gov/>

Slide 4: Hands on Keyboard. Creative Commons Image Source . CC BY 2.0 by Mike Traboe. Available from: <http://www.flickr.com/photos/mtraboe/3553065659/sizes/m/in/photostream/>

Slide 5: Personal Screenshot. Available from: <http://www.iom.edu/Reports/2001/Crossing-the-Quality-Chasm-A-New-Health-System-for-the-21st-Century.aspx>

Slide 6: Image 1—Pills. Available from: <http://www.flickr.com/photos/silverlinedwinnebago/1405216080/sizes/m/in/photostream/>

Attribution-NonCommercial-NoDerivs 2.0 Generic (CC BY-NC-ND 2.0)
SilverlinedWinnebago

Image 2—Arm Band. Veterans Administration. Available from: http://www.houston.va.gov/pressreleases/news_20020910a.asp

Slide 7: Workflow Diagram. Available: <http://www.flickr.com/photos/fenng/32621244/sizes/m/in/photostream/>

David Feng. Attribution-NonCommercial-ShareAlike 2.0 Generic (CC BY-NC-SA 2.0)

Slide 8: Balancing Rocks. Available from: <http://www.flickr.com/photos/preef/269412566/>.

Tony Roberts Attribution-NonCommercial-ShareAlike 2.0 Generic (CC BY-NC-SA 2.0)

Slide 9: Happy Computer. Available from: http://1.bp.blogspot.com/_aVKglbYugv4/SGCZi7FPoKI/AAAAAAAAAuo/qvcEPbalcMY/s1600-h/happy+computer.jpg.

*Indicates this link is no longer functional.

CC BY-NC-SA 2.0 by Cyclone's Sketchblog.

Unit Suggested Readings

1. Webster L, Spiro R. Health information technology: A new world for pharmacy. Journal of the American Pharmacists Association. 2010 April; 50(2): e20-e34. Available from: http://japha.metapress.com/openurl.asp?genre=article&id=doi:10.1331/JAPhA.2010.09170*
2. Dennison J, Eisen S, Towers M, Clark CI. An Effective Electronic Surgical Referral System. Annals of The Royal College of Surgeons of England. 2006; 88(6): 554-556 Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1963768/?tool=pubmed>

Student Application Activities

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comp7_unit4_self_assess_key.doc

Additional Materials

Orientation Videos (optional)

- Part 1: The Reports Tab
- Part 2: Reporting Clinical vs AdHoc
- Part 3: Fun with Graphs
- Part 4: Resolving Reminders
- Part 5: Facilitating Quality Efficiency with Reminders

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Component 7/Unit 5

Unit Title

Fundamentals of Usability in HIT Systems—What Does It Matter?

Unit 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.

Unit Objectives

By the end of this unit the student will be able to:

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

Unit Topics/Lecture Titles

- 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 References

(All links accessible as of 1/1/2012)

Lecture 5a

1. Ergonomic Requirements for Office Work with Visual Display Terminals (VDTs) – Part 11 Guidance on Usability. ISO/IEC 9241.
2. Koppel, R. P., Wetterneck, T. M., Telles, J. L., & Karsh, B.-T. (2008). Workarounds to Barcode Medication Administration Systems: Their Occurrences, Causes, and Threats to Patient Safety. *Journal of the American Medical Informatics Association*, 408-421.
3. National Review Online, “Marines Turned Soldiers” December 10, 2001. 4 Star General Eric Shinseki, U.S. Secretary of Veterans

*Indicates this link is no longer functional.

- Affairs. Available from: <http://old.nationalreview.com/comment/comment-owens121001.shtml>*
4. National Transportation Safety Board Executive Summary of its final report into the Denver crash. January 26, 1999. Available from: <http://www.avweb.com/other/ntsb9905.html>*
 5. Nielsen, Jakob. Definition of Usability. Available from: <http://www.useit.com/alertbox/20030825.html>

Lecture 5a Images

1. Slide 2: Door Alarm. Available from: <http://www.flickr.com/photos/brettlider/5615190034/sizes/m/in/photostream/>
2. Attribution—Share Alike 2.0 Generic (CC BY-SA 2.0) Brett L.'s Photostream.
3. Slide 4: Man in Front of PC Screen, Face in Hands. Courtesy Federal Drug Administration(FDA). Available from: <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/psn/prnter.cfm?id=497>
4. Slide 5: Image 1—Notification window: “This is a generic notification box. You should not be seeing this box.”
5. Image 2—Error message : Error opening this file. Courtesy Dr. Patricia Abbott
6. Slide 6: User-centered Design. Adapted from ISO standard 13407 by Dr. Patricia Abbott
7. Slide 7: Image 1. The Six Iterative Steps of User-Centered Design.
8. Image 2—Older Asian Woman. Courtesy Mark Blatt, M.D. (HIMSS Presentation; MCA; 2009)
9. Slide 8: Eric Shinseki: 7th US Secretary of Veterans Affairs. Courtesy Veterans Administration. Available from: <http://www1.va.gov/opa/bios/>
10. Slide 9: Doctors and Medics in a Makeshift Field Hospital During a Mass-Casualty Exercise on Fort Bragg, N.C. Courtesy US Army. Available from: <http://Army.mil.images>

Lecture 5b

1. Campell, E.M., Guappone, K.P., Sittig, D.F., et al. Computerized Provider Order Entry Adoption: Implications for Clinical Workflow. J Gen Intern Med 2009; 24(1) 21-26. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2607519/>
2. Ergonomic Requirements for Office Work with Visual Display Terminals (VDTs) – Part 11 Guidance on Usability. ISO/IEC 9241 - 11:1998 (E). Geneva, Switzerland. 1998.

*Indicates this link is no longer functional.

3. Guappone, K.P., Ash, J.S., Sittig, D.F. Field Evaluation of Commercial Computerized Provider Order Entry Systems in Community Hospitals. AMIA Annu Symp Proc 2008. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2655948/?tool=pubmed>
4. HIMSS EHR Usability Task Force. Defining and Testing EMR Usability: Principles and Proposed Methods of EMR Usability Evaluation and Rating. 2009. Available from: http://www.himss.org/content/files/HIMSS_DefiningandTestingEMRUsability.pdf
5. Koppel, R., Wetterneck, T., Telles, J.L. Workarounds to Barcode Medication Administration Systems: Their Occurrences, Causes, and Threats to Patient Safety. Jour Amer Med Inform Assoc 2008; 15(4): 408-423. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2442264/?tool=pmcentrez>
6. Usability Basics. Available from: <http://www.usability.gov/basics/index.html>

Lecture 5b Images

Slide 2: Image 1—Bar Code on Arm. Courtesy Dr. Ross Koppel, University of Pennsylvania

Image 2—Flying Trauma Unit. US Military. Available from: http://www.af.mil/photos/media_search.asp?q=medica%27*

Slide 3: Example of Bad Webpage. Compiled image. Courtesy Dr. Patricia Abbott

Slide 4: EHR Screen Shots. Courtesy Dr. Patricia Abbott

Slide 5: Elderly woman and Caregiver. Courtesy On Being. Available from: <http://www.flickr.com/photos/speakingoffaith/4911214966/sizes/m/in/photostream>

Attribution-NonCommercial-ShareAlike 2.0 Generic (CC BY-NC-SA 2.0)

Slide 6: Chessboard. Courtesy Jose Daniel Martinez. Available from: <http://www.fotopedia.com/items/eksvav83iakf3-dZCIfv60qwa>*

Attribution-NonCommercial-ShareAlike 3.0 Unported (CC BY-NC-SA 3.0).

Slide 7: Albert Einstein. Photo from the US National Library of Congress. Public Domain.

Unit Suggested Readings

1. Guappone KP, Ash JS, Sittig DF. Field Evaluation of Commercial Computerized Provider Order Entry Systems in Community Hospitals. AMIA Annu Symp Proc. 2008. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2655948/?tool=pubmed>

*Indicates this link is no longer functional.

2. Koppel R, Wetterneck T, Telles JL. Workarounds to Barcode Medication Administration Systems: Their Occurrences, Causes, and Threats to Patient Safety. *Jour Amer Med Inform Assoc*. 2008; 15(4): 408-423. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2442264/?tool=pmcentrez>
3. Campell EM, Guappone KP, Sittig DF, Dykstra RH, Ash JS. Computerized Provider Order Entry Adoption: Implications for Clinical Workflow. *J Gen Intern Med*. 2009; 24(1) 21-26. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2607519/>
4. HIMSS HER Usability Task Force. Defining and Testing EMR Usability: Principles and Proposed Methods of EMR Usability Evaluation and Rating. 2009. Available from: http://www.himss.org/content/files/HIMSS_DefiningandTestingEMRUsability.pdf

Student Application Activities

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 comp7_unit5_self_assess_key.doc

Additional Materials

Orientation Videos (optional)

- Part 1_Simple Interface Adjustments Font Size & Presentation Order
- Part 2_Created a User Specific View with Graphing

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Component 7/Unit 6

Unit Title

HIT Facilitated Error—Cause and Effect

Unit 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.

Unit Objectives

By the end of this unit the student will be able to:

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

Unit Topics/Lecture Titles

- 6.1 — Error in Healthcare
- 6.2 — Error Vocabulary
- 6.3 — Technology Induced Error

Unit References

(All links accessible as of 1/1/2012)

Lecture 6a

1. Ash J., Berg, M., Coiera, E. Some Unintended Consequences of Information Technology in Health Care: The Nature of Patient Care Information System-related Errors. 2004. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC353015/>

*Indicates this link is no longer functional.

Lecture 6a Images

Slide 1: Navy Officer Examining a Paper Medical Record. Image Courtesy US Dept. of Navy. Available from: http://commons.wikimedia.org/wiki/File:US_Navy_061030-N-1328C061_U.S._Navy_Hospital_Corpsman_Joseph_Malandro_from_Haddon_Township,_N.J.,_files_medical_records_at_the_Michaud_Medical-Dental_Facility.jpg*

Slide 2: Operating Room Team. Available from: <http://www.flickr.com/photos/ooocha/3059605969/sizes/m/in/photostream/>

Attribution-ShareAlike 2.0 Generic (CC BY-SA 2.0) Marion Doss

Slide 3: Nurse Checking a Man's Blood Pressure. Courtesy Dr. Patricia Abbott

Slide 4: Heparin Bottles with the URL to the Quaid Twins Movie. Available from: <http://news.injuryboard.com/more-deaths-reported-as-baxter-expands-heparin-recall.aspx?googleid=29868>

Attribution-NonCommercial-ShareAlike 3.0 Unported (CC BY-NC-SA 3.0) Injury Board National Newsdesk

Slide 5: Heparin Bottles. Available from: <http://news.injuryboard.com/more-deaths-reported-as-baxter-expands-heparin-recall.aspx?googleid=29868>

Attribution-NonCommercial-ShareAlike 3.0 Unported (CC BY-NC-SA 3.0) Injury Board National Newsdesk

Slide 6: Woman Looking at Man Suspiciously. Available from: <http://www.flickr.com/photos/trevin/2063746097/>

Attribution-NonCommercial-ShareAlike 2.0 Generic (CC BY-NC-SA 2.0) Trevin Chow

Lecture 6b

1. AHRQ Web M&M: Glossary. Available from: http://www.webmm.ahrq.gov/popup_glossary.aspx?name=mistakes
2. Ash, J., Sittig, D., Campbell, E., Guappone, K., Dykstra, R. Some Unintended Consequences of Clinical Decision Support Systems. 2007. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2813668/>
3. Graham, T.A.D., Kushniruk, A.W., Bullard, M.J., et al. How Usability of a Web-Based Clinical Decision Support System Has the Potential to Contribute to Adverse Medical Events. 2008. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2655970/>
4. Human Factors Definition (2000). Available from: <http://www.hfes.org/Web/EducationalResources/HFEdefinitionsmain.html>
5. Joint Commission. c2011. Available from: http://www.jointcommission.org/sentinelevents/se_glossary.htm*

*Indicates this link is no longer functional.

6. Oh Shnocks! The state of healthcare technology in “09” medGadget. 4 November 2009. Available from: http://www.medgadget.com/archives/2009/11/oh_shnocks_the_state_of_healthcare_technology_in_09.html

Lecture 6b Images

Slide 2: Images 1 and 3. “ !!STOP!! Do Not Disturb! Passing Medications. Created by Dr. Patricia Abbott.

Image 2: Corpsman Giving Shot to Female Patient. Available from: http://farm5.static.flickr.com/4125/5094485790_dde2e1b735.jpg

Attribution-NonCommercial 2.0 Generic (CC BY-NC 2.0)

Slide 4: Frustrated Man. Creative Commons. Available from: <http://www.flickr.com/photos/14511253@N04/4411497087/sizes/m/in/photostream/>

Attribution 2.0 Generic (CC 2.0).

Video: “Oh Schnocks!” The state of healthcare technology in 2009.

Available from: <http://www.youtube.com/watch?v=WxQLzdLjwp4>

Slide 5: Human Factors in Surgery. Video From the Mayo Clinic, Available from: <http://www.youtube.com/watch?v=xR78dXTYy9c>

Slide 6: Urinal. Available from:

<http://www.flickr.com/photos/executionsinfo/2465290115/>

Attribution-NonCommercial 2.0 Generic (CC BY-NC-SA 2.0)

Unit Suggested Readings

1. “How Usability of a Web-Based Clinical Decision Support System Has the Potential to Contribute to Adverse Medical Events.” Accessed June 28, 2010 at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2655970/>
2. “Some Unintended Consequences of Clinical Decision Support Systems.” Accessed on June 28, 2010 at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2813668/>
3. “Some Unintended Consequences of Information Technology in Health Care: The Nature of Patient Care Information System-related Errors“. Accessed June 2, 2010 at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC353015/>

Student Application Activities

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comp7_unit6_self_assess.doc

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Additional Materials (Presentation videos)

Three videos, available online at the time these materials were created, illustrate several of the concepts covered in the presentations and readings. These three videos are integrated directly into the presentation. Errors in Medication Administration from YouTube – The Story of the Quaid Twins: <http://www.youtube.com/watch?v=XEbf9bliOus> (If the video is not available at the time of student access, on any web video search engine using the terms “Quaid Twins – Medication Error” will return nearly the same video.)

Technology Induced Error - “Oh Schnocks!” The state of healthcare technology in 2009: <http://www.youtube.com/watch?v=WxQLzdLjwp4>
Human Factors in Surgery Video. From the Mayo Clinic. <http://www.youtube.com/watch?v=xR78dXTYy9c>

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Component 7/Unit 7

Unit Title

Protecting Privacy, Security, and Confidentiality in HIT Systems

Unit 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.

Unit Objectives

By the end of this unit the student will be able to:

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.

Unit Topics/Lecture Titles

- 7.1 — Administrative Safeguards
- 7.2 — Physical Safeguards
- 7.3 — Technical Safeguards

Unit References

(All links accessible as of 1/1/2012)

Lecture 7a

The Nationwide Privacy and Security Framework for Electronic Exchange of Individually Identifiable Health Information. c2008.
Available from:

http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_10731_848088_0_0_18/NationwidePS_Framework-5.pdf*

*Indicates this link is no longer functional.

Lecture 7a Images

Slide 5: Cover Sheet from an National Institute of Standards and Technology (NIST) Information Security Document. Courtesy National Institute of Standards (NIST).

Slide 9: Nationwide Privacy and Security Framework for Electronic Exchange of Individually Identifiable Health Information. 2008. Available from:

http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_10731_848088_0_0_18/NationwidePS_Framework-5.pdf*

Slide 10: Security Operations in Action. Courtesy Centers for Disease Control.

Slide 11: A New ISIS Video Camera. Courtesy Department of Homeland Security. Available from:

http://www.dhs.gov/files/programs/gc_1273160563362.shtml*

Slide 12: A Regularly Scheduled Security Awareness Training Session. Image courtesy CDC.

Slide 13: “Symposium on Diversity, Leadership Development and Succession Planning” at the CDC. Courtesy CDC.

Slide 14: Doctor Looking Through Medical Records. Courtesy HHS.

Slide 15: Centers for Disease Control’s Activity Lead for the Division of Specialized Media, Pete Seidel. Courtesy CDC.

Lecture 7b

1. American Health Information Management Association. Available from: <http://www.ahima.org/>
2. Ensuring Security of High-Risk Information in EHRs c2008. Available from: http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_039956.hcsp?dDocName=bok1_039956
3. HIPAA Security Series: Security 101 for Covered Entities .c2004 Available from: <http://www.hhs.gov/ocr/privacy/hipaa/administrative/securityrule/security101.pdf>
4. Nationwide Privacy and Security Framework for Electronic Exchange of Individually Identifiable Health Information. c2008. Available from: http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_10731_848088_0_0_18/NationwidePS_Framework-5.pdf*
5. Scribd. Mobility Infrastructure Solution Design Guide. c2008. Available from: http://www.scribd.com/doc/24975115/Procurve-Wifi-Network-Design-Guide*

*Indicates this link is no longer functional.

6. U.S. Department of Health and Human Services. Available from: <http://www.hhs.gov/>

Lecture 7b Images

Slide 3: HIPPA Security Bulletins. Courtesy HIPPA. Available from: <http://www.hhs.gov/ocr/privacy>

Slide 5: Logo of the Federal Trade Commission. Courtesy Federal Trade Commission.

Slide 6: Cloud Computing will Challenge Security Policies. Courtesy U.S. Dept. of Commerce

Slide 7: The Field of Security Has to Adapt. Courtesy National Institutes of Health (NIH)

Slide 8: A Sophisticated Users' Station. Courtesy National Science Foundation (NSF) Available from: <http://www.nsf.gov/od/lpa/news/press/00/stim5.htm>

Slide 9: Transmission Security Controls Prevent Unauthorized Access to ePHI.

Available from: <http://blog.tsa.gov/2008/08/encryption-is-issue-in-case-of-missing.html>.

Unit Suggested Readings

1. HIPAA Security Series: Security 101 for Covered Entities .c2004
Available from: <http://www.hhs.gov/ocr/privacy/hipaa/administrative/securityrule/security101.pdf>
2. Ensuring Security of High-Risk Information in EHRs c2008.
Available from: http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_039956.hcsp?dDocName=bok1_039956
3. The Nationwide Privacy and Security Framework for Electronic Exchange of Individually Identifiable Health Information. c2008.
Available from:
http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_10731_848088_0_0_18/NationwidePS_Framework-5.pdf*

Additional Materials

1. The U.S. Department of Health and Human Services. Available from <http://www.hhs.gov/>
2. The American Health Information Management Association. Available from: <http://www.ahima.org>

*Indicates this link is no longer functional.

3. The Nationwide Privacy and Security Framework for Electronic Exchange of Individually Identifiable Health Information. c2008. Available from:
http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_10731_848088_0_0_18/NationwidePS_Framework-5.pdf*
4. Scribd. Mobility Infrastructure Solution Design Guide. c2008. Available from: http://www.scribd.com/doc/24975115/Procurve-Wifi-Network-Design-Guide*

Student Application Activities

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Component 7/Unit 8

Unit Title

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

Unit 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.

Unit Objectives

By the end of this unit the student will be able to:

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.).

Unit Topics/Lecture Titles

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

Unit References

(All links accessible as of 1/1/2012)

Lecture 8a Images

Slide 4: The Systems Development Process. Courtesy Michael Vaughn.

Slide 6: Implementation Steps. Courtesy Michael Vaughn

Slide 8: Workflow Diagram .Courtesy Michael Vaughn

Slide 10: Business Process Flow Chart. Courtesy Dr. Patricia Abbott.

Slide 12: Clinician Looking at Computer. Courtesy Centers for Disease Control. Available from: <http://www.cdc.gov/>

*Indicates this link is no longer functional.

Lecture 8b

1. Calman, N., Kitson, K., Hauser, D. Using Information Technology to Improve Health Quality and Safety in Community Health Centers. Pro Community Health Partnership. 2009 Dec 4. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2788767/?tool=pubmed>
2. Lorenzi, N., Kouroubali, A., Detmer, D., Bloomrosen, M. How to successfully select and implement electronic health records (EHR) in small ambulatory practice settings. BMC Medical Informatics and Decision Making. 2009;9:15. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2662829/pdf/1472-6947-9-15.pdf>
3. Tools for Skilled Nursing Facilities & LTC Toolkit. Available from: <http://www.stratishealth.org/expertise/healthit/nursinghomes/nhtoolkit.html>
4. DOQ-IT ("Dock-it"): Available from: <http://www.masspro.org/docs/tools/DOQIT%20WB%20for%20WEB.pdf>
5. Health Information Technology Toolkit for Physician Offices. Available from: <http://www.stratishealth.org/expertise/healthit/clinictoolkit.html>
6. Tools for Community Health Clinics & Safety Nets Toolkit. Available from: <http://www.stratishealth.org/expertise/healthit/hospitals/htoolkit.html>

Lecture 8b Images

Slide 9: Clinician looking at computer. Image courtesy Centers for Disease Control. CDC. PHIL_3664_lores.jpg

Unit Suggested Readings

1. Calman N, Kitson K, Hauser D. Using Information Technology to Improve Health Quality and Safety in Community Health Centers. Pro Community Health Partnership. 2009 Dec 4. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2788767/?tool=pubmed>
2. Lorenzi N, Kouroubali A, Detmer D, Bloomrosen M. How to successfully select and implement electronic health records (EHR) in small ambulatory practice settings. BMC Medical Informatics and Decision Making. 2009;9:15. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2662829/pdf/1472-6947-9-15.pdf>

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Student Application Activities

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Additional Materials

Toolkits

Our goal to teach you where to find the answers rather than providing reams of material for students to memorize.

StratisHealth (slide 16)

Health Information Technology Toolkit for Nursing Homes

<http://www.stratishealth.org/expertise/healthit/nursinghomes/nhtoolkit.html>

DOQ-IT (slide 17)

A Systems Approach to Operational Redesign

<http://www.norc.org/6275/Module5/A%20Systems%20Approach%20to%20Operational%20Redesign%20Workbook.pdf>*

StratisHealth (slide 17)

Health Information Technology Tool for Physician Office

<http://www.stratishealth.org/expertise/healthit/clinics/clinictoolkit.html>

StratisHealth (slide 18)

Health Information Technology Toolkit for Critical Access and Small Hospitals

<http://www.stratishealth.org/expertise/healthit/hospitals/htoolkit.html>

Additional Information

AHRQ National Resource Center

Health IT Adoption Toolbox

<http://healthit.ahrq.gov/portal/server.pt?open=512&objID=1077&cached=true&mode=2&userID=7330>

Community Clinics Initiative Health Information Technology Resource Guide

http://www.communityclinics.org/files/804_file_HITRG_Updated_2009_FINAL.pdf

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Component 7/Unit 9

Unit Title

Potential Issues with Adoption and Installation of an HIT system

Unit 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.

Unit Objectives

By the end of this unit the student will be able to:

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.

Unit Topics/Lecture Titles

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

Unit References

(All links accessible as of 1/1/2012)

Lecture 9

1. Adler, K. How to Successfully Navigate Your EHR Implementation; Family Practice Management. 2007 February. Available from: <http://www.aafp.org/fpm/2007/0200/p33.html>
2. Bartos, C., Bulter, B., Penrod, L., Fridsma, D., Crowley, R. Negative CPOE Attitudes Correlate with Diminished Power in the Workplace. *AMIA Annu Symp Proc* 2008; 2008: 36-40. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2655973/>
3. Neto, A., Chen, T. & Chan J. "Order effect" in the provision of medication information. *MJA* 2002; 176 (8): 401-4020
4. Psychiatric News; May 7, 2010 ; Volume 45 Number 9 Page 6; from the American Psychiatric Association. Available from: <http://psychnews.psychiatryonline.org/issues.aspx?journalid=61>

*Indicates this link is no longer functional.

5. Trivedi, M., Daly, E., Kern, J., et al. Barriers to implementation of a computerized decision support system for depression: an observational report on lessons learned in “real world” clinical settings.” BMC Medical Informatics and Decision Making 2009. Available from: <http://www.biomedcentral.com/1472-6947/9/6>
6. Walsh, S. The clinician’s perspective on electronic health records and how they can affect patient care. BMJ 2004 May 15: 328(7449): 1184-1187. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC411103/?tool=pmcentrez>

Lecture 9 Charts, Tables, and Figures

9.1 Adler, K. How to Successfully Navigate Your EHR Implementation; Family Practice Management. 2007 February.

Available from: <http://www.aafp.org/fpm/2007/0200/p33.html>

9.2 Boonstra, A., Broekhuis, M. Barriers to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions. *BMC Health Services Research* 2010, 10:231 .Available from: <http://www.biomedcentral.com/1472-6963/10/231>

Lecture 9 Images

Slide 2: Girl Flexing Muscles. Courtesy Dr. Patricia Abbott

Slide 4: Beauty and the Beast. Available from:

http://www.flickr.com/photos/e_photos/2646616379/sizes/m/in/photostream/

Attribution-NonCommercial-ShareAlike 2.0 Generic (CC BY-NC-SA 2.0)

Slide 5: Shop Sign. Courtesy Dr. Patricia Abbott.

Slide 6: Pills. Available from:

<http://www.flickr.com/photos/silverlinedwinnebago/1405216080/sizes/m/in/photostream/>

Attribution-NonCommercial-NoDerivs 2.0 Generic (CC BY-NC-ND 2.0)

SilverlinedWinnebago.

Slide 7: Lion. Available from: http://upload.wikimedia.org/wikipedia/commons/4/40/Just_one_lion.jpg

GNU Free Documentation License

Unit Suggested Readings

1. Trivedi M, Daly E, Kern J, Grannemann B, Sunderajan P, Claassen C. Barriers to implementation of a computerized decision support system for depression: an observational report on lessons learned in “real world” clinical settings.” BMC Medical Informatics and

*Indicates this link is no longer functional.

- Decision Making 2009. Available from: <http://www.biomedcentral.com/1472-6947/9/6>
2. Walsh, S. The clinician's perspective on electronic health records and how they can affect patient care. *BMJ* 2004 May 15: 328(7449): 1184-1187. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC411103/?tool=pmcentrez>
 3. Bartos C, Bulter B, Penrod L, Fridsma D, Crowley R. Negative CPOE Attitudes Correlate with Diminished Power in the Workplace. *AMIA Annu Symp Proc* 2008; 2008: 36-40. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2655973/>

Resources

Boonstra A, Broekhuis M. Barriers to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions. *BMC Health Services Research* 2010, 10:231 Available from: <http://www.biomedcentral.com/1472-6963/10/231> (comp7_unit9_handout2)

1. Adler, K. How to Successfully Navigate Your EHR Implementation; Family Practice Management. 2007 February. Available from: <http://www.aafp.org/fpm/2007/0200/p33.html> (comp7_unit9_handout1)
2. AHRQ Emerging Lessons Toolkit: http://healthit.ahrq.gov/portal/server.pt/community/ahrq-funded_projects/654/emerging_lessons/11227
3. AAFP: HIT in the Small Office Online Tutorials <http://www.centerforhit.org/online/chit/home/cme-learn/tutorials.html>
4. HIMSS Flyer – Getting Started With An EHR http://www.himss.org/content/files/GettingStartedEMR_Flyer1.pdf*
5. ACP: EHR Adoption Road Map and Tools http://www.acponline.org/running_practice/technology/ehr/roadmap/
6. HRSA Implementation Tool Kit http://www.hrsa.gov/publichealth/business/healthit/toolbox/HealthITAdoptiontoolbox/*

Student Application Activities

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Component 7/Unit 10

Unit Title

HIT and Aspects of Patient-Centered Care

Unit 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.

Unit Objectives

By the end of this unit the student will be able to:

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.

Unit Topics/Lecture Titles

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

Unit References

(All links accessible as of 1/1/2012)

Lecture 10a

1. Better Diabetes Care, 2006. What We Want to Achieve Through Systems Changes..Retrieved 10/18/2011. Available from: <http://betterdiabetescare.nih.gov/WHATpatientcenteredcare.htm>
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7. Video: Don Berwick—What Patient Centered Care Really Means. Available from: <http://www.youtube.com/watch?v=SSauhroFTpk>

Lecture 10a Images

Slide 1: Hispanic Man & Nurse Practitioner. Available from: <http://www.flickr.com/photos/usdagov/5059815989/sizes/m/in/photostream/>

Courtesy the US Department of Agriculture: Attribution-NoDerivs 2.0 Generic (CC BY-ND 2.0) USDA

Slide 3: Image 1—Elderly Gentleman. Courtesy the National Institutes of Health. Available from: <http://betterdiabetescare.nih.gov/MAINframework.htm>

Image 2—Girl, Provider, and Mother. Courtesy the National Institutes of Health. Available from: <http://betterdiabetescare.nih.gov/MAINwhat.htm>

Slide 4: Aged Hand. Courtesy United Nations Photos: Available from: http://www.flickr.com/photos/un_photo/5509873619/sizes/m/in/photostream/

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Slide 5: Don Berwick. Courtesy US Department of Health and Human Services. Available from: http://www.hhs.gov/open/images/donald_berwick.jpg*

Slide 6: Image 1—Nursing Avatar. Courtesy Dr. Patricia Abbott.

Image 2—Patient Like Me. Available from: http://en.wikipedia.org/wiki/Patients_like_me.

Slide 7: A Medical Model VERSUS Patient-Centered . Adapted from public domain materials supported by Department of Health and Human Services. Available from:

<http://www.esrdnet5.org/Files/Education/Training-Mod/Module-2--Patient-Centered-Care.aspx>

Slide 8: Man Questioning Another and African American Clinician with Clipboard: Agency for Healthcare Quality and Research: Available from: <http://www.ahrq.gov/questionsaretheanswer/>

*Indicates this link is no longer functional.

Slide 9: Screenshot of <http://www.ahrq.gov/clinic/tp/pcchhttp.htm>.

Courtesy Dr. Patricia Abbott.

Slide 10: A Picture of the Greek God Kairos. Available from: <http://www.museoegizio.it/>

Lecture 10b

Blue Button Initiative. Available from: https://www.cms.gov/NonIdentifiableDataFiles/12_BlueButtonInitiative.asp

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Lecture 10 b Images

Slide 3: My HealthyeVet site. Courtesy the US Department of Veterans Affairs. Available from: www.myhealth.va.gov

Slide 4: My HealthyeVet Banner . Courtesy the US Department of Veterans Affairs . Available from: www.myhealth.va.gov

Slide 5: Blue Button. Courtesy of the US Department of Veterans Affairs. Available from: www.myhealth.va.gov

Slide 7: I-pad health apps. Courtesy Dr. Patricia Abbott

Slide 9: Baby on computer .Source: <http://www.flickr.com/photos/tfrancis/539308690/sizes/m/in/photostream/> Tyron Francis

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Unit Suggested Readings

1. "Who will demand access to their personal health record? A focus on the users of health services and what they want." Accessed June 10, 2010 at: <http://www.longwoods.com/content/19503> (PubMed Central – Open Access article)
2. "Developing Informatics Tools and Strategies for Consumer-centered Health Communication." Accessed June 28, 2010 at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2442255/>

Student Application Activities

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comp7_unit10_self_assess.doc

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Additional Materials

Resources

1. Committee on Quality of Health Care in America: Crossing the Quality Chasm: A New Health System for the 21st Century: Institute of Medicine, Washington, DC, 2001.
2. Down S. Why I Want a Blue Button. Huffington Post. Available from: http://www.huffingtonpost.com/stephen-j-downs/why-i-want-a-blue-button_b_768195.html
3. Fox S, Jones S. The Social Life of Health Information. Pew Internet. 2009. Available from: <http://www.pewinternet.org/Reports/2009/8-The-Social-Life-of-Health-Information.aspx>
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5. What We Want to Achieve Through Systems Changes. Better Diabetes Care. c2006. Available from: <http://betterdiabetescare.nih.gov/WHATpatientcenteredcare.htm>

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Component 7/Unit 11

Unit Title

Health IT in the Future

Unit 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.

Unit Objectives

By the end of this unit the student will be able to:

1. Speculate the relationship between HIT and health reform
2. Suggest alternative design for usable & supportive HIT
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 Topics/Lecture Titles

- 11.1 – Alternative Designs for HIT
- 11.2 – Infodemiology

Unit References

(All links accessible as of 1/1/2012)

Lecture 11a

Patient Protection and Affordable Care Act by United States Congress Title III - Improving the Quality and Efficiency of Health. Available from: <http://www.healthcare.gov>

Donald Berwick, MD, the administrator of the Centers for Medicare & Medicaid Services (CMS) .America's Health Insurance Plans (AHIP) Medicare Conference. August 2010. Available from: <http://www.healthcareitnews.com/news/berwick-says-fragmented-care-no-longer-option>

Dr. Mark Smith, "Health IT: Hope, Hype and How to Avoid the Road to Hell." Available from: <http://www.chcf.org/>

*Indicates this link is no longer functional.

Lecture 11a Images

Slide 3: Screenshot of healthcare.gov site. Courtesy healthcare.gov .

Available from: <http://healthcare.gov>

Slide 4: Nurse, Patient, and Telehealth Device. Courtesy Dr. Patricia Abbott.

Slide 5: Dr. Mark Smith.

Slide 6: Image 1. Wrist Computer. Courtesy Wikimedia. Available from:

<http://upload.wikimedia.org/> GNU Open License.

Image 2. Bot. Courtesy US Army. Available from: <http://usarmy.vo.llnwd.net/e1-images/2008/12/18/27527/army.mil-27527-2008-12-19-071219.jpg>*

Image 3. Cow, a Dying Breed, Cat, & Implantable Chip. Courtesy Dr. Patricia Abbott.

Slide 7: Image 1. Corneal smart device – Image collage adapted from : http://www.sensimed.ch/images/pdf/white_paper_first_clinical_experience.pdf.

Image 2. iPhone concept phone . Available from: <http://techiser.com/next-generation-iphone-concept-by-samuel-lee-kwon-126850.html>*

Image 3. Disruptive demographics website. Available from: <http://www.disruptivedemographics.com>*

Image 4. Flexi-phone . Courtesy Jeff Mcneill. Available from: <http://www.flickr.com/photos/jeffmcneill/3449473610/sizes/m/in/photostream/>

Lecture 11b

1. Fleischauer, A., Diaz, P., & Sosin, D. (2008). Biosurveillance: A Definition, Scope and Description of Current Capability for a National Strategy. *Advances in Disease Surveillance* 2008;5:175.
2. Detmer, D., Bloomrosen, M., Raymond, B., Tang, P. Integrated Personal Health Records: Transformative Tools for Consumer-Centric Care. BMC Medical Information Decision Maker. 2008: 8: 45. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2596104/>
3. Eysenbach, G. Infodemiology and Infoveillance: Framework for an Emerging Set of Public Health Informatics Methods to Analyze Search, Communication and Publication Behavior on the Internet. *Journal of Medical Internet Research*. Available from: <http://www.jmir.org/2009/1/e11>
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7. Roehr, B. Health care in US ranks lowest among developed countries. *British Medical Journal*, July 21. 2008.

Lecture 11b Images

Slide 6: Image of Google Flu Trends website. Courtesy Google Flu Trends. Available from: http://www.google.org/flutrends/video/GoogleFluTrends_USFluActivity.mov

Patrick K, Griswold W, Raab F, Intille S. Health and the Mobile Phone. *Am J Prev Med*. 2008 August; 35(2) 177-181. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2527290/?tool=pmcentrez>

Detmer D, Bloomrosen M, Raymond B, Tang P. Integrated Personal Health Records: Transformative Tools for Consumer-Centric Care. *BMC Med Inform Decis Mak*. 2008; 8: 45. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2596104/>

Student Application Activities

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Additional Materials

Eysenbach G. Infodemiology and Infoveillance: Framework for an Emerging Set of Public Health Informatics Methods to Analyze Search, Communication and Publication Behavior on the Internet. *Journal of Medical Internet Research*. Available from: <http://www.jmir.org/2009/1/e11>

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Component Acronym Glossary

ADT—Admission, Discharge, Transfer
AHIMA—American Health Information Management Association
AHRQ—Agency for Health Care Quality and Research
ASP—application service provider
BCMA—Bar Code Medication Administration
BMS—bed management system
CMS—Centers for Medicare and Medicaid Services
COWS—computers on wheels
CPOE—Computerized Provider Order Entry
CPRS—computerized patient record system
EBP—Evidence Based Practice
EHR—Electronic Health Records
e-MAR—electronic medication administration record
EPHI—Electronic Protected Health Information
GUI—graphical user interface
HIE—Health Information Exchanges
HIMSS—Health Information Management Systems Society
HIO —Health Information Organization
HIPPA—Health Insurance Portability and Accountability Act
HITECH Act—Health Information Technology for Economic and Clinical Health Act
HIT—Health Information Technology
IOM—Institute of Medicine
ISO—International Standards Organization
LIS—laboratory information system
LOINC—Logical Observation Identifiers Name and Codes
LTC—long term care
MRN—medical record number
NHIN—National Health Information Network
NIST—National Institute of Standards

NTSB—National Transportation and Safety Board
ONC—Office of the National Coordinator for Health Information Technology
PACS—picture archiving and communication system
PDA—Personal Digital Assistant
PHI—Protected Health Information
PHR—personal health record
RIS—radiology information system
SNF—Skilled Nursing Facility
UCD—User-Centered Design
UML—Unified Modeling Language
USB—Universal Serial Bus
VA—Department of Veterans Affairs
VDT—Visual Display Terminals
VistA—Veterans Health Information Systems and Technology Architecture
WIIFM—What’s in it for me



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