



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

Component 11: Configuring Electronic Health Records

Instructor Manual Version 3.0/Spring 2012

Notes to Instructors

This Instructor 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

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Component Overview

This component provides a practical experience with a laboratory component (utilizing the VistA for Education program) that will address approaches to assessing, selecting, and configuring EHRs to meet the specific needs of customers and end-users.

Component Objectives

At the completion of this component, the student will be able to:

1. Describe the process of migration to an electronic health record (EHR) from the perspectives of organizational strategy, planning, analysis of EHR options, decision-making techniques, training, and implementation strategies.
2. Discuss the migration path from a paper to an electronic health record with an emphasis on organizational strategy to implementation, including meaningful use criteria.
3. Discuss the importance and use of clinical decision support systems for clinical and administrative use.
4. Given an EHR system, configure the system to achieve features required for meaningful use. The course includes VistA simulation EHR environment lab exercises for:
 - a. Patient care clinical workflow
 - b. Implementing clinical decision support
 - c. Building order sets
 - d. Utilizing data entry templates
 - e. Health summary and clinical reminder reports
5. Understand clinical workflows from multiple clinician perspectives, and in different clinical settings.
6. Understand concepts of privacy and security as applied to the EHR, including regulatory frameworks, risk management, authentication and authorization, user passwords, and physical security of systems.
7. Describe security issues with mobile and medical devices, and elements of disaster preparedness and disaster recovery.
8. Discuss the migration path from a paper to an electronic health record with an emphasis on organizational strategy to implementation, including meaningful use criteria.

Component Authors

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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 11/Unit 1

Unit Title

Migration to an Electronic Health Record System

Unit Description

This Unit focuses upon the process of migrating to an Electronic Health Record System, and the Electronic Health Record life cycle.

Unit Objectives

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

1. Describe the process of initial planning, including identification of stakeholders, champions, management and implementation teams, and determining appropriate members for a steering committee (Lecture a)
2. Develop a timeline for choosing and implementing an electronic health record, including defining the scope of implementation, budget estimates, and additional critical steps to build a basic strategic plan for implementation (Lecture a, b)
3. Develop functional requirements, including a workflow analysis and a gap analysis, and recognizing when to bring in expertise (Lecture a)
4. Develop and applying criteria for selecting an appropriate vendor for the electronic health record including (Lecture b):
5. Generate an RFI/RFP
6. Select an appropriate system, including utilizing an appropriate ranking model
7. Generate interface requirements
8. Compare and contrast EHR solutions (e.g. locally hosted versus cloud solutions)
9. Negotiate a contract (Lecture b)
10. Develop a training plan (Lecture b)

Unit Topics / Lectures

1. Initial planning and project development
2. Developing functional requirements
3. Developing and applying criteria for selecting an appropriate vendor for the electronic health record

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Unit References

Lecture 1a

1. Adler, Kenneth. How to successfully navigate your EHR implementation. *Family Practice Management*, 2007 Feb; 14 (2): 33-39.
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Lecture 1b

1. Abdelhak, A, Grostick, S, Hanken, M, Jacobs, E. *Health Information: Management of a Strategic Resource*, 4th Edition: Saunders.
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6. Lowes R. EMR Success: Training is the Key. Med Econ 2004 May 7Z;81(9):TCP11-4.
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Student Application Activities

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Component 11/Unit 2

Unit Title

Patient Care Clinical Workflow; Multiple Perspectives of Patient Care (VistA Demo)

Unit Description

This unit introduces the student to patient care clinical workflows from multiple perspectives. A brief lecture introduces the concept of workflows and their relevance to EHR implementation. The lab exercises in this unit focus on the patient and demonstrate the use of EHRs through the workflows of clinicians and ancillary care providers in the outpatient, inpatient, and emergency department settings. The lecture in this unit compares workflows from a paper and EHR perspective. The focus in this unit is on change management.

Unit Objectives

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

1. Register a patient in a VistA simulation EHR environment. (Lab Exercise 1)
2. Enter vitals and chief complaint as a Medical Assistant in a VistA simulation EHR environment. (Lab Exercise 1)
3. Enter a progress note as a Physician in a VistA simulation EHR environment. (Lab Exercise 3)
4. Enter nursing notes and implement physician orders as a Registered Nurse in a VistA simulation EHR environment. (Lab Exercise 2)
5. Understand the importance of clinical workflows in the functioning of EHRs. (Lecture, Lab Exercise 1,2, 3)

Unit Topics/Lectures

1. Define clinical workflows and discuss how implementing EHR affects workflows with examples
2. Demonstrate EHR use from multiple clinician perspectives, with an emphasis on clinical workflows

Unit References

Lecture

1. Aarts J, Ash J, Berg M. Extending the understanding of computerized physician order entry: implications for professional collaboration,

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 3. Gooch P, Roudasri A. Computerization of workflows, guidelines, and care pathways: a review of implementation challenges for process-oriented health information systems *J Am Med Inform Assoc* 2011;18:738-748
 4. Niazkhani Z, Pirnejad H, Berg M, Aarts J. Review Paper: The Impact of Computerized Provider Order Entry Systems on Inpatient Clinical Workflow: A Literature Review. *J Am Med Inform Assoc* 2009;16:539-549
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Tables, Charts and Figures

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Student Application Activities

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Component 11/Unit 3

Unit Title

Implementing Clinical Decision Support (VistA Demo)

Unit Description:

This unit discusses implementing clinical decision support, which broadly refers to providing clinicians or patients with computer-generated clinical knowledge and patient related information, intelligently filtered and presented at appropriate times, to enhance patient care. A short lecture is followed by a series of hands-on lab exercises through which students will learn how to configure and use three tools for decision support implemented in the EHR: Alerts or Notifications, Order Checks and Clinical Reminders.

Unit Objectives

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

1. Define and discuss clinical decision support (Lecture)
2. Describe, view and create Alerts/Notifications in a VistA simulation EHR environment (Lecture, Lab Exercise 1)
3. Describe, view and create Order Checks in a VistA simulation EHR environment (Lecture, Lab Exercise 2)
4. Describe, view and resolve Reminders in a VistA simulation EHR environment (Lecture, Lab Exercise 3)
5. Discuss the value of these EHR functions as clinical decision support tools (Lecture)

Unit Topics/Lectures

1. Alerts/Notifications
2. Order Checks
3. Clinical Reminders
4. Use of these elements as Reminders as clinical decision support tools

Unit References

Lecture

1. Amatayakul MK. Electronic health records: A practical guide for professionals and organizations. 4th ed. Chicago IL: AHIMA; 2009.
2. Barnett G., Winickoff R, Dorsey J, Morgan M, Lurie R. (1978). Quality assurance through automated monitoring and concurrent feedback

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 11. Garg A, Adhikari N, McDonald H, Rosas-Arellano M, Devereaux P., Beyene J, et al. (2005). Effects of computerized clinical decision support systems on practitioner performance and patient outcomes: a systematic review. *J Am Med Assoc*. 2005;293:1223-1238.
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 14. Hebda T, Czar P. Handbook of informatics for nurses & healthcare professionals. 4th ed. New Jersey: Pearson: 2009.
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Student Application Activities

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Component 11/Unit 4

Unit Title

Building Order Sets (VistA Demo)

Unit Description

This unit identifies the value of order sets as a quality control/quality improvement mechanism and an efficiency tool in clinical settings. Typically, order sets are created by clinicians with expertise in treatment plans. Through a series of lab exercises, students will learn how to take those treatment plans and implement them into specific order sets within the VistA simulation EHR system.

Unit Objectives

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

1. Define and describe an order set (Lecture)
2. Describe the benefits and costs associated with order sets (Lecture)
3. Demonstrate the ability to build a variety of order sets in the VistA simulation EHR environment (Lab Exercises 1-3)

Unit Topics/Lectures

1. Building order sets
2. Creating and customizing order (menu) screens
3. Creating laboratory quick orders
4. Creating medication quick orders
5. Combining quick orders in an order set

Unit References

Lecture

1. Amatayakul MK. Electronic health records: A practical guide for professionals and organizations. 4th ed. Chicago IL: AHIMA; 2009.
2. Ash, Joan S., Stavri, P Zoë, Kuperman, Gilad J. The Practice of Informatics: Synthesis of Research Paper: A Consensus Statement on Considerations for a Successful CPOE Implementation. J Am Med Inform Assoc 2003; 10:229-234 doi:10.1197/jamia.M1204
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Student Application Activities

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Component 11/Unit 5

Unit Title

Creating Data Entry Templates (VistA Demo)

Unit Description

Templates are important tools in the collection of data manually entered into Electronic Health Record systems. When implemented appropriately, they can help to standardize the data entered into the system, provide controls that ensure the quality of the data captured, and provide data capture efficiencies through effective design and use. This unit provides a brief lecture followed by lab exercises that will provide the student with practical experience creating and using data entry templates

Unit Objectives

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

1. Access and use the template editor (Lab Exercise 1)
2. Effectively use the different field controls to promote data quality and efficiency of data entry (Lecture, Lab Exercise 1)
3. Design, create and view Personal and Shared Templates for data entry (Lab Exercise 2 & 3)
4. Describe how the effective use of data entry templates supports quality care, patient safety and efficiency (Lecture)

Unit Topics/Lectures

1. Appropriate use and benefits of data entry templates
2. Document templates
3. Shared templates
4. Personal templates

Unit References

Lecture

1. AHIMA. Quality data and documentation for EHRs in physician practice. J Am Health Inform Assoc. 2008 Aug; 79 (8): 43-48. Available at: http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_039546.hcsp?dDocName=bok1_039546*
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Student Application Activities

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Component 11/Unit 6

Unit Title

Health Summary and Clinical Reminder Reports (VistA Demo)

Description

The ability to quickly retrieve information from the EHR is a key function. Two reporting tools commonly implemented in EHR systems to support information retrieval are [1] the ability to generate standard reports that provide widely used information and [2] the ability to quickly create *ad hoc* reports to access information to meet more specific needs. In this unit, the student will learn the attributes of quality information and engage in lab exercises creating Health Summary and Clinical Reminder reports two basic types reports found in the EHR.

Objectives

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

1. Design, view and create Health Summary reports in the VistA simulation EHR environment. (Lecture & Lab Exercise 1)
2. Design, view and create Clinical Reminder reports in the VistA simulation EHR environment. (Lecture & Lab Exercise 2)
3. Design, view and create ad hoc reports. (Lecture & Lab Exercise 1)
4. Describe how quality reporting functions in an EHR supports quality care, patient safety and efficiency. (Lecture)
5. Define the attributes of quality information. (Lecture)

Topics/Lectures

1. Ad hoc health summary reports
2. User-customized health summary reports
3. Clinical reminder reports
4. Attributes of quality information
5. Benefits of quality reporting from an EHR

Unit References

Lecture

1. Amatayakul MK. Electronic health records: A practical guide for professionals and organizations. 4th ed. Chicago IL: AHIMA; 2009.

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http://findarticles.com/p/articles/mi_m0DUD/is_12_23/ai_95913343/.
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Student Application Activities

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Component 11/Unit 7

Unit Title

Privacy and Security in the US

Unit Description

This unit introduces the basic concepts of privacy and security and the surrounding regulatory requirements for health information. In addition, the concepts of risk management, authentication methods and malware will be introduced, as well as issues of physical and secondary device security.

Unit Objectives

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

1. Compare and contrast the concepts of privacy and security (Lecture a)
2. List the regulatory frameworks for an EHR (Lecture b, c)
3. Describe the concepts and requirements for risk management (Lecture d)
4. Describe authentication, authorization and accounting (Lecture d)
5. Describe passwords and multi-factor authentication and their associated issues (Lecture d)
6. Describe issues with portable devices (Lecture d)
7. Describe elements of disaster preparedness and disaster recovery (Lecture e)
8. Describe issues of physical security (Lecture e)
9. Describe malware concepts (Lecture f)

Unit Topics/Lectures

1. Privacy and security concepts
2. Regulatory requirements for health information
3. Risk management
4. Authentication, authorization and accounting
5. Portable devices
6. Physical security
7. Malware

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Unit References

Lecture 7a

1. Dimick, C. (2010, August 9, 2010). Californian Sentenced to Prison for HIPAA Violation. Retrieved Jan 2012 from <http://journal.ahima.org/2010/04/29/californian-sentenced-to-prison-for-hipaa-violation> .

Lecture 7b

1. American Recovery and Reinvestment Act of 2009, Public Law 111-5, 123 Stat. 115 (2009).
2. Health Information Technology for Economic and Clinical Health Act, Title XIII of Public Law 111-5, 123 Stat. 115 (2009).
3. Health Insurance Portability and Accountability Act of 1996, Public Law 104–191, 110 Stat. 1936 (1996).
4. US Department of Health & Human Services. (2008). The Privacy Rule, from <http://www.hhs.gov/ocr/privacy/hipaa/administrative/privacyrule/index.html>
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6. US Government Printing Office (2011–2015). Strategic Plan; Mission. Retrieved Jan 2012 from <http://www.gpo.gov/about/strategicplan.htm>

Lecture 7c

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Lecture 7c Charts, Tables, Figures

- 4.1 Table: Sample breaches
- 4.2 Table: Examples of laws and regulations

Lecture 7d

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Lecture 7d Images

- 4.3 Chart: Stoneburner, G., Goguen, A., & Feringa, A. (2010). Risk Assessment Methodology Flowchart from Risk Management Guide for Information Technology Systems (pp. 9). Gaithersburg, MD: National Institute of Standards and Technology. Retrieved Jan 2012 from http://upload.wikimedia.org/wikipedia/commons/5/5a/NIST_SP_800-30_Figure_3-1.png (PD-US).

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Student Application Activities

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Health IT Workforce Curriculum

Configuring Electronic
Health Records

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Version 3.0/Spring 2012

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Component 11/Unit 8

Unit Title

Meaningful Use and Implementation

Description

This unit describes the meaningful use program of the Health Information Technology for Economic and Clinical Health (HITECH) Act of the American Recovery and Reinvestment Act (ARRA) from the vantage point of the VistA simulation electronic health record (EHR). It discusses eligibility for meaningful use incentive payments and the criteria for achieving those payments in Stage 1 of the program. It shows examples of some of the criteria from within screens of the VistA simulation EHR environment.

Objectives

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

1. Describe meaningful use (MU) of health information technology in the context of the Health Information Technology for Economic and Clinical Health (HITECH) Act (Lecture a)
2. Define the criteria for Stage 1 of meaningful use for eligible professionals and eligible hospitals (Lecture a)
3. Demonstrate examples of meaningful use using the VistA Electronic Health Record (EHR) (Lecture b)

Topics/Lectures

1. Requirements for meaningful use
2. Implementation of meaningful use
3. Core and menu criteria for Stage 1 of meaningful use for eligible professionals and eligible hospitals
4. Examples of meaningful use using the VistA simulation EHR environment

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Lecture 8a Charts, Tables, Figures

2.1 Figure: Overview: What is Meaningful Use?, Missouri Health Information Technology Assistance Center. Stage 1 rules set in 2010 (Blumenthal, 2010); Stage 2 rules likely to be announced in 2012 (Drazen, 2011). Retrieved from <http://assistancecenter.missouri.edu/node/17>. Accessed Jan 2012.

Lecture 8b Images

Slide 4: Screenshot showing the cover sheet view in Vista. (Hersh, 2011).
Slide 5: Screenshot showing the CPRS view in Vista. (Hersh, 2011).
Slide 6: Screenshot showing the events that occur when a particular selection is made in the screen that was described previously in the clinical reminders list CPRS view screenshot. (Hersh, 2011).

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Slide 7: Screenshot of the Vista electronic record showing the view that a clinical coordinator would see on CPRS, the Windows interface for the electronic health record. (Hersh, 2011).

Slide 8: Screenshot showing the CPRS view of the template editor. (Hersh, 2011).

Slide 9: Screenshot of the CPRS window that pops up when a data entry template field editor selection is made. (Hersh, 2011).

Slide 10: This screenshot shows the process of document creation from the back – end review of our patient. (Hersh, 2011).

Slide 11: Screenshot of an order checks selection in CPRS view. (Hersh, 2011).

Slide 12: Screenshot describing the sequence of events when a specific order set is selected when a reminder is fired by the system. (Hersh, 2011).

Slide 13: Screenshot of the Vista electronic record shows the view that a provider would see on CPRS, the Windows interface for the electronic health record. (Hersh, 2011).

Student Application Activities

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Component Glossary

ADEs	Adverse Drug Event
AI	Artificial Intelligence
AMIA	American Medical Informatics Association
AQA	Ambulatory Care Quality Alliance
ARRA	American Reinvestment and Recovery Act
ASTM	American Society for Testing and Materials
BATNA	Best Alternative to a Negotiated Agreement
BMI	Body Mass Index
CAC	Clinical Application Coordinator
CAH	Critical Access Hospital
CCD	Continuity of Care Document
CCHIT	Certification Commission for Health Information Technology
CCR	Continuity of Care Record
CDS	Clinical Decision Support
CEO	Chief Executive Officer
CIO	Chief Information Officer
CMIO	Chief Medical Information Officer
CMS	Centers for Medicare and Medicaid
CPOE	Computerized Provider order Entry
CPRS	<i>Computerized Patient Record System</i>
CR	<i>Clinical Reminder</i>
DSS	Decision Support System
DVD	Deep Vein Thrombosis
DXplain	DXplain, a decision support system developed at the Laboratory of Computer Science at the Massachusetts General Hospital
EH	Eligible Hospital
EHR	Electronic Health Record
EMR	Electronic Medical Record
EP	Eligible Providers
ES	Expert System
GUI	Graphical User Interface
HHS	Health and Human Services
HIE	Health Information Exchange
HIT	Health Information Technology
HITECH	Health Information Technology for Economic and Clinical Health (Act)
HQA	Hospital Quality Alliance

ICDCM	International Classification of Diseases Clinical Modifications
IEEE	Institute of Electrical and Electronics Engineers
IFR	Interim Final Rule
InfoGard Laboratories	independent, accredited IT security laboratory
IOM	Institute of Medicine
ISCA Labs	security industry's central anti-virus product testing and certification facility
LOINC	Logical Observation Identifiers Names and Codes
mEq/dl	milliequivalent deciliter
mg/dl	milligrams per decilitre
MIPPA	Medicare Improvement for Patients and Providers Act
MLMs	Medical Logic Modules
MYCIN	a decision support system developed by Stanford University in the early- to mid-seventies, built to assist physicians in the diagnosis of infectious diseases
NCPDP	National Council for Prescription Drug Programs
NCQA	National Committee for Quality Assurance
NEJM	New England journal of Medicine
NEPSI	National ePrescribing Patient Safety Initiative
NHIN	National Health Information Network
NPRM	Notice of Proposed Rulemaking
NQF	National Quality Forum
OD	Organization Development
ONC – ATCB	Office of the National Coordinator Authorized Testing and Certification Body
ONC	Office of the National Coordinator
ORCM	Online Remote Construction Management
PHR	Personal Health Record
PQRI	Physician Quality Reporting Initiative
QIO	Quality Improvement Organization
QMR	Quick Medical Reference
RFI	Request for Information
RFP	Request for Proposal
RHIO	Regional Health Information Organization
RHQDAPU	Reporting Hospital Quality Data for Annual Payment Update

RxNorm	RxNorm provides normalized names for clinical drugs and links its names to many of the drug vocabularies commonly used in pharmacy management and drug interaction software
SANDS (from Wright's dissertation)	no known spell out
SLI Global Solutions	an Electronic Health Records Testing and Certification company that is an ONC-ATCB
SNOMED-CT	Systematized Nomenclature of Medicine--Clinical Terms
Surescripts	an e-prescription network
UNII	Unique Ingredient Identifiers
VA	Veterans Administration
XML	Extensible Markup Language
WIZorder	a computerized clinician order entry system continuously developed by DBMI faculty working with Informatics Center Staff and trainees at Vanderbilt since 1994



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