Health Management Information Systems

Electronic Health Records

Lecture a

This material Comp6_Unit3a was developed by Duke University, funded by the Department of Health and Human Services, Office of the National Coordinator for Health Information Technology under Award Number IU24OC00024.
Electronic Health Records
Learning Objectives

1. State the similarities and differences between an electronic medical record (EMR) and electronic health record (EHR) (Lecture a)
2. Identify attributes and functions of an EHR (Lecture a)
3. Describe the perspectives of health care providers and the public regarding acceptance of or issues with an EHR, which can serve as facilitators of or major barriers to its adoption (Lecture a)
4. Explain how the use of an EHR can affect patient care safety, efficiency of care practices, and patient outcomes (Lecture a)
Electronic Health Records
Learning Objectives

4. Discuss how Health Information Exchange (HIE) and Nationwide Health Information Network (NHIN) impact health care delivery and the practice of health care providers (Lecture b)

5. Outline issues regarding governmental regulation of EHR systems, such as meaningful use of interoperable health information technology and a qualified R (Lecture b)

6. Summarize how the Institute of Medicine’s Vision for 21st Century Health Care and Wellness may impact health management information systems (Lecture b)

7. Identify how ongoing developments in biomedical informatics can affect future uses and challenges related to health information systems (Lecture b)
Purpose of a Patient (Medical) Record

• “To recall observations, to inform others, to instruct students, to gain knowledge, to monitor performance, and to justify interventions”
• Serves as the legal business record
Electronic Medical Record (EMR)

- Electronic record of health-related information on an individual
  - Within one health care organization
EMR Purpose

• Provide an electronic equivalent of an individual’s legal medical record
  – Intra-organizational
Electronic Health Record (EHR)

• Electronic record of health-related information on an individual
  – Across more than one health care organization
EHR Purpose

• Provide an electronic equivalent of an individual’s health record for use by providers and staff across more than one health care organization

• Support efficient, high-quality integrated health care, independent of the place and time of health care delivery
## EMR Versus EHR

### Table 3.1

**EMR and EHR Comparison**

<table>
<thead>
<tr>
<th>EMR</th>
<th>EHR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A record of medical care created, managed, and maintained by one health care organization (intra-organizational)</td>
<td>A repository of individual health records that reside in numerous information systems and locations (inter-organizational)</td>
</tr>
<tr>
<td>Integration of health care data from a participating collection of systems from one health care organization</td>
<td>Aggregation of health-related information into one record focused around a person’s health history, i.e., a comprehensive, longitudinal record</td>
</tr>
<tr>
<td>Consulted by authorized clinicians and staff within one health care organization.</td>
<td>Consulted by authorized clinicians and staff across more than one health care organization</td>
</tr>
<tr>
<td>Data continuity throughout one health care organization</td>
<td>Data interoperability across different organizations</td>
</tr>
</tbody>
</table>
EHRs Versus Paper Records

- EHRs can make a patient’s health information available when and where it is needed
- EHRs can bring a patient’s total health information together in one place, and always be current
- EHRs can support better follow-up information for patients
- EHRs can improve patient and provider convenience
EHRs Versus Paper Records

• EHRs
  – Can link information with patient computers to point to additional resources
  – Don’t just “contain” or transmit information, they also compute with it
  – Can improve safety
EHRs Versus Paper Records

• EHRs can
  – Deliver more information in more directions
    • While reducing “paperwork” time for providers
  – Improve privacy and security
  – Reduce costs
Attributes of an EHR

• Provides secure, reliable, real-time access to patient health record information, where and when it is needed to support care
• Captures and manages episodic and longitudinal electronic health record information
Attributes continued

• Functions as clinicians’ primary information resource during the provision of patient care
• Assists with the work of planning and delivering evidence-based care to individual and groups of patients
• Supports continuous quality improvement, utilization review, risk management, and performance monitoring
Attributes continued

• Captures the patient health-related information needed for reimbursement
• Provides longitudinal, appropriately masked information to support clinical research, public health reporting, and population health initiatives
• Supports clinical trials
HL7 EHR Functions

• Direct care functions
• Supportive functions
• Information infrastructure functions
## Direct Care Functions

**Table 3.2**

*HL7 2007 EHR-S Functional Model Direct Care Functions Subsets with Examples*

<table>
<thead>
<tr>
<th>Subset</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care management</td>
<td>Identify and maintain a patient record</td>
</tr>
<tr>
<td></td>
<td>Manage patient demographics</td>
</tr>
<tr>
<td></td>
<td>Manage problem lists</td>
</tr>
<tr>
<td>Clinical decision support</td>
<td>Support for standard care plans, guidelines, protocols</td>
</tr>
<tr>
<td></td>
<td>Support for medication and immunization administration</td>
</tr>
<tr>
<td></td>
<td>Orders, referrals, results and care management</td>
</tr>
<tr>
<td>Operations Management and Communication</td>
<td>Clinical workflow tasking</td>
</tr>
<tr>
<td></td>
<td>Support clinical communication</td>
</tr>
<tr>
<td></td>
<td>Support for provider-pharmacy communication</td>
</tr>
</tbody>
</table>
Supportive Functions

• Clinical Support
• Measurement, Analysis, Research and Reports
• Administrative and Financial
Information Infrastructure

Functions

- Security
- Health record information and management
- Registry and directory services
- Standard terminologies and terminology services
- Standards-based interoperability
- Business rules management and Workflow management
Standards for Certification of EHR Technology

• Content exchange standards
  – NCPDP SCRIPT Standard
  – HL7 Clinical Document Architecture (CDA), CCD

• Vocabulary standards
  – SNOMED CT
  – LOINC

• Privacy and security standards
  – NIST encryption algorithm
  – NIST hashing algorithm
EHR Acceptance

• Health care provider
  – Increasing momentum for widespread adoption and implementation of EHRs
    • ARRA/HITECH
    • Authorized Testing and Certification Body by the Office of the National Coordinator
EHR Acceptance

• Public
  – Harris Interactive Survey from 2005
    • Mixed Feelings
      – 45% EHR system important
    • Concern over
      – Privacy
      – Increase rather than decrease of medical errors
EHR Acceptance: Public

• Harris Interactive Survey
  – All physicians treating me should have access to information contained in my EMR
    • Percent answering "Strongly/Somewhat Agree"
      – 78% in 2009
      – 78% in 2010
  – An EMR would be a valuable tool to track the progress of my health
    • Percent answering "Strongly/Somewhat Agree"
      – 72% in 2009
      – 71% in 2010
Barriers to Adoption

- Cost of conversion
- Perceived lack of ROI
- Technical and logistical challenges
- Privacy and security concerns
EHR Effect on Patient Care Safety

- Reduces the need to repeat tests
- Reduces the number of lost reports
- Supports provider decision making
EHR Effect on Efficiency

• Improves accessibility of patient information
• Integrates data from multiple internal and external sources
• Facilitates the co-ordination of health care delivery
EHR Effect on Patient Outcomes

• Has the potential to
  • Improve the quality of patient care
  • Help providers practice better medicine
  • Provide seamless exchange of information among providers
Electronic Health Records Summary – Lecture a

• Defined an EMR and EHR
• Explained similarities and differences
• Identified EHR attributes and functions
• Discussed the issues surrounding EHR adoption and implementation
• Described the impact of EHRs on patient care
Electronic Health Records
References – Lecture a

References

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References


• The National Alliance for Health Information Technology. (2008, April 28). *Defining key health information technology terms*. Retrieved from healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_10741_848133_0_0_18/10_2_hit_terms.pdf


Charts, Tables, Figures

3.1 Table: *EMR and EHR Comparison*

3.2 Table: *HL7 2007 EHR-S Functional Model Direct Care Functions Subsets with Examples*