Slide 1

Component 9 - Networking and Health Information Exchange

Unit 6-1
EHR Functional Model Standards

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Slide 2

Unit 6 - 1 Objectives

- Understand the definition(s) of an Electronic Health Record
- Understand architecture for an EHR
- Identify and understand key standards for the EHR

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Slide 3

What is an EHR?

- Many definitions – why?

- What is its form and format?

- What is its purpose?

- Who is it for?

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Slide 4

What is an EHR?

- Also Known As:
  – Automated Medical Record
  – Computerized Medical Record
  – Computer-Based Medical Record
  – Electronic Medical Record
  – Electronic Health Record
- It's not a:
  – Data Warehouse
  – Clinical Data Repository
  – Disease Registry

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Slide 5

Institute of Medicine (IOM) Definition (1991, 1997)

The patient record is:
- principal repository for data concerning a patient's health care
- affects virtually everyone associated with providing, receiving, auditing, regulating or reimbursing health care services

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Slide 6

IOM Definition (1991, 1997)

"A computer-based patient record is an electronic patient record that resides in a system specifically designed to support users by providing accessibility to complete and accurate data, alerts, reminders, clinical decision support systems, links to medical knowledge, and other aids."

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Slide 7

Expanding the Definition

- Different groups have expanded on these earlier definitions of the EHR
- Groups include ISO, CEN, IOM, ASTM, and others
- Common understanding is important for sharing and aggregating of clinical data

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Slide 8

ISO EHR Standards

- ISO TR 20514
  - EHR Definition, Scope and Context
- ISO TS 18308
  - Requirements for an Electronic Health Record Reference Architecture
- ISO IS 13606-1
  - EHR Communication- Part 1: Reference Model

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Slide 9

ISO TR 20514

- Describes a pragmatic classification of electronic health records
- Provides simple definitions for the main categories of EHR
- Provides supporting descriptions of the characteristics of EHRs and record systems
- Defines the set of components that form the mechanism by which patient records are created, used, stored, and retrieved

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Slide 10

EHR Architecture

- A model of the generic features necessary in any EHR in order that the record may be communicable, complete, a useful and effective ethical-legal record of care, and may maintain integrity across systems, countries and time
- The architecture does not prescribe or dictate what anyone stores in their health records
  - Nor does it prescribe or dictate how any EHR system is implemented
  - It places no restrictions on the types of data which can appear in the record, including those which have no counterpart in paper records

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Slide 11

ISO TS 18308 Scope

"Assemble and collate a set of clinical and technical requirements for an electronic health record reference architecture that supports using, sharing, and exchanging electronic health records across different health sectors, different countries, and different models for health care delivery."

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Slide 12

ISO TS 18308 Scope

- Does not define functional requirements for an EHR System
- Rather "… a set of clinical and technical requirements for a record architecture that supports using, sharing, and exchanging electronic health records across different health sectors, different countries, and different models for health care delivery."

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Slide 13

ISO 13606

Considers the EHR to be the persistent longitudinal and multi-enterprise record of health and care provision relating to a single subject of care, created and stored in one or more physical systems in order to inform the subject's future health care and to provide a medico-legal record of care that has been provided.

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Slide 14

ISO 13606

• Goal:
  – Define a rigorous and stable information architecture for communicating part or all of the EHR of a single subject of care
  – Preserve original clinical meaning intended by author
  – Reflect the confidentiality of that data as intended by the author and patient

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Slide 15

ISO 13606

• Not intended to specify internal architecture or database design
• Supports a dual model approach
  – Reference model – represents the generic properties of health record information
  – Archetype Model – a formal expression of a distinct, domain-level concept, expressed in the form of constraints on data whose instances conform to the reference model

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Slide 16

ISO 13606

- Assumes a hierarchical structure as base for EHR architecture
- Top level is an EHR Extract that can contain part or all of an EHR

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Slide 17

ISO 13606 Hierarchical Structure

- EHR EXTRACT – is a hierarchy of folders
- FOLDER – contains compositions
  - Compartment relating to care provider for a single condition over a fixed period of time
- COMPOSITION – contains nested sections
  - Set of information committed to EHR by one agent as a result of single encounter

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Slide 18

ISO 13606 Hierarchical Structure

- Section
  - Contains entries
  - Data under one clinical heading
    - Such as lab data
- Entry
  - Contains elements and clusters
  - Result of one observation
- Cluster
  - Contains elements
  - Means of organizing nested data structures
    - Such as a time series
- Element
  - Leaf node containing a single data value

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Slide 19

ASTM EHR Standards

- **E 1239** Standard Guide for Description of Reservation/Registration-Admission, Discharge, Transfer (R-ADT) Systems for Automated Patient Care Information Systems
- **E 1384** Standard Guide for Content and Structure of the Electronic Health Record
- **E 1633** Standard Specification for the Coded Values Used in the Electronic Health Record

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Slide 20

ASTM EHR Standards

- **E 1715** Standard Practice for an Object-Oriented Model for Registration, Admitting, Discharge, and Transfer (R-ADT) Functions in Computer Based Patient Record Systems
- **E 1744** Standard Guide for a View of Emergency Medical Care in the Computerized Patient Record

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Slide 21

ASTM E 1769

- Defines functions for an EHR
- Addresses reminders and alerts
- Addresses authorized use of EHR
- Discusses multiple uses of EHR
- Discusses protection of data in EHR

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Slide 22

Summary

In this subunit, we have:
• Drawn attention to several standards from various SDOs that deal with EHR definition, architecture and content
  • None of these standards are complete and definitive
  • Unfortunately, the current state of the art for EHRs is similar to the story of five blind men and the elephant
    • Until a stronger agreement is reached, content interoperability, efficiency, and query will be compromised
  • We are unlikely to ever have a single standard for an EHR architecture
    • The reasons include:
      • Lack of agreement among developers
      • The proprietary nature of the architectural design
      • Legacy systems
      • Many other reasons

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