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Curriculum Development Centers Program

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

Component 9 - Networking and Health Information Exchange

Unit 4-1

Basic Health Data Standards

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Unit 4 Objectives

- Understand why it is necessary to use a common set of data elements with common names to be able to exchange and understand data from other places.
- Understand what is meant by semantic interoperability.
- Understand many of the sets of controlled vocabularies in use today – how they are used and who requires their use.

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The Problem

- Understanding what the data says
- Understanding what the data means
- Understanding where the data is
- Understanding the context in which the data is collected
- Failure to understand may result in a medical error and maybe even death

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Semantic Interoperability

- The ability to share data whose meaning is unambiguously clear and precise, its context understood, and it can be used for any purpose. With true semantic interoperability, the receiver is independent from the sender.

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Problems Preventing Semantic Interoperability

- Same words that have different meanings
- Different words that have the same meaning
- Words that are too general to convey a specific meaning
- Localisms that lose meaning beyond that region
- Failure to pay attention to factors other than name, such as units or how measured
- Inconsistencies in the level at which things are described

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Semantic Interoperability: Issues

- Legacy of existing data
- Over 400 terminologies in use today plus local vocabularies
- Lack of a solution = no semantic interoperability

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More Problems

- There are too many choices for too many purposes.
- Certain “words” are required for specific uses, but these choices do not satisfy multiple uses.
- Most institutions use local vocabularies and map to the broader set of controlled vocabularies they are required to use.

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Confusion Comes Quickly

- Vocabulary
- Terminology
- Nomenclature
- Classification
- Taxonomy
- Ontology
- Groupers

Different coding systems are classified in one of these categories. Does it matter?

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Basic Features of Terminology

- Unique Identifier – code
  - Numeric and without meaning
  - May include check digit
  - Moving toward use of ISO-based Object Identifier (paths in a tree structure)
  - Assigning authority is assigned to organizations who in turn assign the identifiers
    - HL7 is an assigning authority at 2.16.840.1.113883 (joint-iso-itu-t.country.us.organization.hl7)
- Official Name
  - Female
- Synonyms
  - Woman, girl

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General Categories of Terms

- Demographics
- Signs and symptoms
- Anatomy
- Physical Findings
- Diagnostic procedures
- Organisms
- Diagnoses
- Medications
- Therapeutic Procedures
- Adverse Events
- Genomics

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Coding the Data - Gender

- Data element – gender
- Class: demographic
- Controlled terminology (value set)
  - Male
  - Female
  - Unknown (don't know, haven't asked)
  - Unknown (can't tell) (by dress; anatomically)
- Representation
  - M,F,U or 0,1,2 or other
- Administrative or clinical

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What Are The Choices? (1/2)

- International Classification of Disease – (ICD) [WHO]
- Common Procedural Terminology (CPT) [American Medical Association]
- DSM-IV
- Diagnosis-related Group (DRG)
- National Drug Codes (FDA)
- RxNorm (FDA)
- VA National Drug Formulary
- Structured Product Labeling
- Logical Observation Identifiers, Names and Codes (LOINC) [Regenstrief]

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What Are The Choices (2/2)

- MEDCIN
- SNOMED – CT
- International Classification of Primary Care (ICPC) [WONCA]
- Medical Dictionary for Regulatory Activities (MedDRA) [ICH]
- Nursing Terminologies
- Mesh (NLM)
- Gene Ontology
- Unified Medical Language System

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Summary

- Semantic interoperability – unsolved
- Too many vocabularies creating ambiguity in meaning
- Limits reuse of data