Slide 1

Curriculum Development
Centers Program

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

Component 9 - Networking and Health Information Exchange

Unit 4-3
Basic Health Data Standards

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Slide 2

Unit 4-3 Objectives

• Understand the use, purpose and interrelation among sets of controlled vocabularies in use today

• Identify the more common controlled vocabularies in use today: SNOMED, MEDCIN, MedDRA, Nursing terminologies, MeSH and UMLS

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Slide 3

Evolution of SNOMED

• Systematized Nomenclature of Diseases and Organisms (SNDO) - 1928 - NY Academy of Medicine
• Systematized Nomenclature of Pathology (SNOP) - 1965
• Systematized Nomenclature of Medicine (SNOMED) - 1979
• SNOMED-RT (Reference Terminology)(1999)
• SNOMED-CT (Merger with Read)(2002)
• International Healthcare Terminology SDO (2007)

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Slide 4

SNOMED-CT

- Created by the merger, expansion and restructuring of SNOMED-RT and Read Codes
- 344,000 concepts, 450,000 medical descriptions, 700,000 concept interrelations
- Cross maps to ICD9-CM, ICD-10, LOINC

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Slide 5

SNOMED-CT Components

- Concepts
- Descriptions
- Hierarchies
- Relationships

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Slide 6

Example

```
284196006|Burn of skin|:
   246112005|Severity|=24484000|severe
   363698007|Finding Site|=
      (113185004|Structure of skin between fourth and fifth toes|:
         272741003|Laterality|=7771000|left)
```

Such expressions are said to be post-coordinated as contrasted to pre-coordinated terms.

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Slide 7

Semantic Representation in SNOMED-CT

Tularemia

Bacterial Pneumonia

is-a

Pulmonary Tularemia

has-finding-site

has-causative-agent

associated-morphology

Lung Structure

Inflammation

Francisella tularensis

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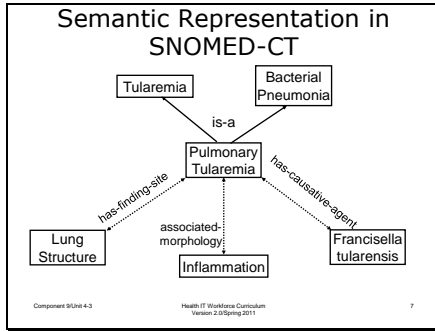
Slide 8

SNOMED Axes

- Findings [F]
- Procedures [P]
- Body structures (anatomy) [T]
- Morphology [M]
- Organisms [L]
- Substances [C]
- Physical agents [A]
- Occupations
- Social context
- General
- Other

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Terminology Model

- Ruptured ovarian cyst (D7-75111)
  - Is a disease (D7-00000)
  - Has morphology rupture (M-14400)
  - Has morphology cyst (M-33400)
  - Has topography ovary (T-87000)

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MEDCIN

- System of standardized medical terminology developed by Medicomp Systems
- Includes over 250,000 clinical data elements encompassing symptoms, history, physical exam, tests, diagnoses and therapy

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Slide 11

International Classification for Primary Care (ICPC)

- Used by individual family practices and group practices
- Use is to record primary care patient encounter
  - Includes reason for encounter (chief complaint)
  - Focuses on patient perspective
    - Includes fear of disease
    - Request for preventive services
    - Request for treatment

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Medical Dictionary for Regulatory Activities (MedDRA)

- International medical terminology used by regulatory authorities and regulated biopharmaceutical industry
- Terminology for coding all medical data obtained during all phrases of development and marketing:
  - Symptoms
  - Signs
  - Disease
  - Diagnoses
  - Indications
  - Investigations/Procedures
  - Medical/Social History

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Slide 13

MedDRA codes

- Unique 8 digit number, starting with 10000001
- As terms added, codes assigned sequentially
- Example
  – Gastric hemorrhage (LLT) = 10017789
  – Gastric haemorrhage (LLT) = 100177188
  – Gastrointestinal disorders (SOC) = 10017947

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Nursing Terminologies

- NANDA Taxonomy
- Clinical Care Classification
- Patient Care Data Set
- Omaha System
- AORN Perioperative Data Set
- International Classification of Nursing Practice
- Nursing Interventions Classification
- Nursing Outcomes Classification

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Slide 15

Coding Nursing Concepts

- Diagnoses/Judgements
- Interventions
- Outcomes
- Goals

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Nursing Terminologies

	Diagnoses	Interventions	Outcomes	Goals
NANDA	X			
NIC		X		
NOC			X	
CCC	X	X	X	
PCDS	X	X		X
Omaha	X	X	X	
AORN	X	X	X	
ICNP	X	X	X	X

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Medical Subject Headings (MeSH)

- Used to tag medical abstracts with concept-based information
- Created to improve information retrieval
- Introduces the notion of "context" for the same concept
- Free for use in the US and in most countries

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MeSH Example

D011014: Pneumonia
    D018410: Pneumonia, Bacterial
        D007877: Legionnaires' Disease
        D011018: Pneumonia, Pneumococcal
        D011019: Pneumonia, Mycoplasma
            D009175: Mycoplasma Infections
                D011002: Pleuropneumonia, Contagious
        D011022: Pneumonia, Rickettsial
        D011023: Pneumonia, Staphylococcal
    D001996: Bronchopneumonia
    D009956: Ornithosis
    D011001: Pleuropneumonia
    D011015: Pneumonia, Aspiration
        D011017: Pneumonia, Lipid
    D011020: Pneumonia, Pneumocystis carinii
    D011024: Pneumonia, Viral

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Unified Medical Language System

"The purpose of the [Unified Medical Language System] is to improve the ability of computer programs to 'understand' the biomedical meaning in user inquiries and to use this understanding to retrieve and integrate relevant machine-readable information for users."

- Donald A.B. Lindberg, 1993

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UMLS Structure

- Three main components:
  - Metathesaurus
  - Semantic Network
  - Specialist Lexicon and tools

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Choice of terminologies

	HPI	PMH	Exam	Labs	Diag	Dx	Rx	Tx
ICD$					+	++		++
CPT$				+	+			+
DRG						+		
NDC							+++	
RxNorm							+++	
LOINC				+++	+			
Nursing						++		
SNOMED	+++	+++	+++	++	++	+++	++	++
MeSH	+	+	+	+	++	++	++	++
UMLS	++	++	++	++	++	++	++	++

HPI: History of present illness　PMH: Past medical history　Exam-Physical exam　Labs-Clinical lab
Diag: Other tests　Dx: Diagnoses　Rx: Medications　Tx: Other therapy

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Current Situation

- SNOMED-CT is gaining momentum as the terminology of choice
- LOINC is used in the US for laboratory test names
- RxNorm is likely to be drug code of choice in US
- ICD x is required for reimbursement
- Adverse events – maybe MedDRA

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Summary

The complex problems caused by use of local terminologies and too many controlled terminologies continues to be an obstacle to interoperability. Until this problem is solved, the sharing and aggregation of data among disparate sites will result in a loss of information and prone to error.

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