SNOMED CT for the HIM professional

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SNOMED CT and the HIM professional

- HIM and the health care record
- Clinical reference terminology
- SNOMED CT
  - Overview
- SNOMED CT and ICD-10-CA/CCI
- ICD-11
- Roles for HIM

Health Information Management professionals and the health care record

HIM and the health care record

- Stewards of the health care record
- Collect, classify and analyze health care data
  - Statistics
  - Research
  - Health care funding
- Electronic health care record (EHR) is the future
  - SNOMED CT- the clinical reference terminology chosen by Canada Health Infoway Standards Collaborative for the pan-Canadian EHR

HIM and the health care record

SNOMED CT

- User interface or in the background of the EHR.
- Used by clinicians to input clinical information into the EHR at the point of care.
- Clinical information can be retrieved from the EHR without losing it’s original meaning.
- Will not replace ICD-10-CA or CCI, but can be mapped with these classifications

HIM and the health care record

SNOMED CT secondary uses

- Decision support
- Statistics
- Outcomes measurement
- Public health surveillance
  - Epidemics
- Research
- Cost analysis

Clinical Reference Terminology

Why does the EHR need a clinical reference terminology?

Computers don't understand:

- Free text.
  - Words need to be assigned a code, such as a set of numbers, that represent each word.
    - Coded terminology
- Context.
  - Coded terminology has to be defined in a way that the computer can understand the meaning.
    - Cold can mean the illness or the temperature.

What is a clinical reference terminology?

- Clinical reference terminology
  - "A set of concepts, designations or descriptions, and relationships for a specialized subject area [that provide] a common reference point for comparison [and] aggregation…"(CHI, 2013)
  - "A terminology in which every concept designation has a formal, machine-usable definition supporting data aggregation and retrieval."(CIMI, 2014)

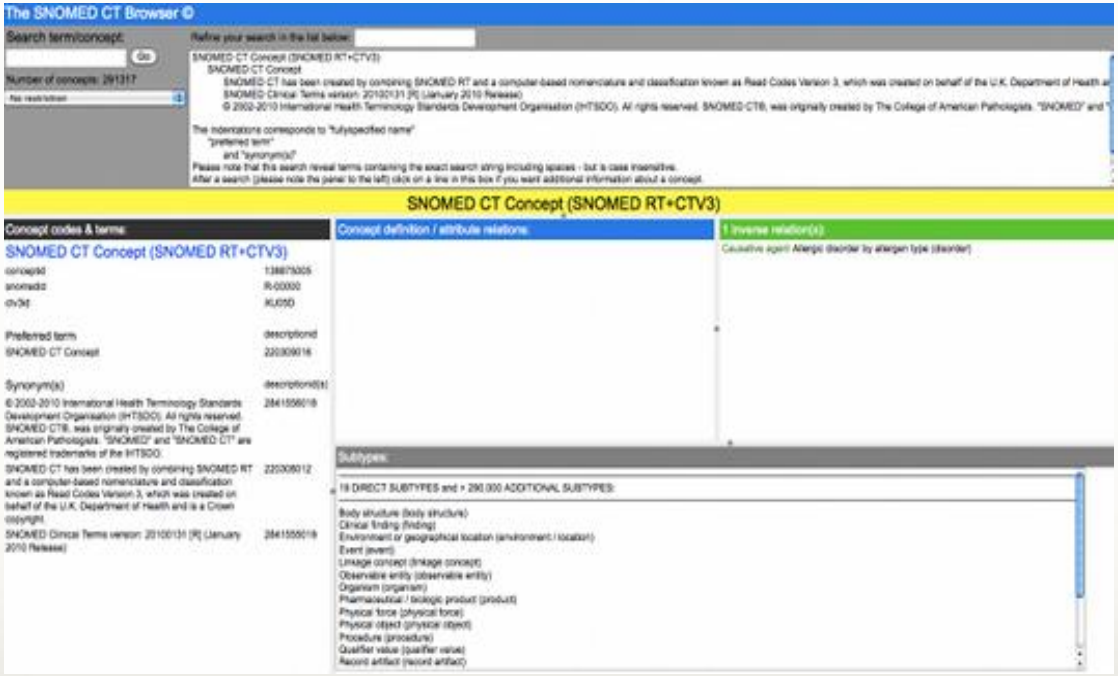
What is a clinical reference terminology?

- Clinical reference terminology
  - Computer can understand the meaning and context of the concept
    - Cold
      - Feels cold (finding) 64713002
      - Common cold (disorder) 82272006
  - Semantic interoperability
    - Two or more systems can communicate information and understand what is being communicated in the same way.
    - The meaning of the message or data is the same to the receiver as it was to the sender.

Why does the EHR need a clinical reference terminology?

- Define meaning and context of concepts in a computer-readable way.
- Health care information can be entered or retrieved by different individuals, using different equipment, at different times throughout the health care visit , and the meaning of the message will always stay the same

SNOMED CT


The SNOMED CT Browser ©
Search term/concept:
Go
Number of concepts: 291317
Refine your search in the list below:
SNOMED CT Concept (SNOMED RT+CTV3)
SNOMED CT Concept
SNOMED CT has been created by combining SNOMED RT and a computer-based nomenclature and classification known as Read Codes Version 3, which was created on behalf of the U.K. Department of Health a
SNOMED Clinical Terms version: 20100131 [R] (January 2010 Release)
© 2002-2010 International Health Terminology Standards Development Organisation (IHTSDO). All rights reserved. SNOMED CT®, was originally created by The College of American Pathologists. "SNOMED" and "
The indentations corresponds to "fully-specified name"
"preferred term"
and "synonym(s)"
Please note that this search reveal terms containing the exact search string including spaces - but is case insensitive.
After a search (please note the panel to the left) click on a line in this box if you want additional information about a concept.
SNOMED CT Concept (SNOMED RT+CTV3)
Concept codes & terms:
Concept definition / attribute relations:
1 inverse relation(s):
SNOMED CT Concept (SNOMED RT+CTV3)
conceptid
138875005
snomedct
R-00000
ctv3id
XU05D
Preferred term
descriptionid
SNOMED CT Concept
220309016
Synonym(s)
description(s)
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SNOMED Clinical Terms version: 20100131 [R] (January 2010 Release)
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Subtypes:
19 DIRECT SUBTYPES and > 290,000 ADDITIONAL SUBTYPES:
Body structure (body structure)
Clinical finding (finding)
Environment or geographical location (environment / location)
Event (event)
Linkage concept (linkage concept)
Observable entity (observable entity)
Organism (organism)
Pharmaceutical / biologic product (product)
Physical force (physical force)
Physical object (physical object)
Procedure (procedure)
Qualifier value (qualifier value)
Record artifact (record artifact)

What is SNOMED CT?

Systematized NOmenclature of MEDicine Clinical Terms (SNOMED CT)

- Clinical Reference Terminology
- Nomenclature
  - A naming system using pre-established rules that creates a standardized terminology
  - Codes can be assigned to the terminology
  - Codes can be combined to create more complex codes

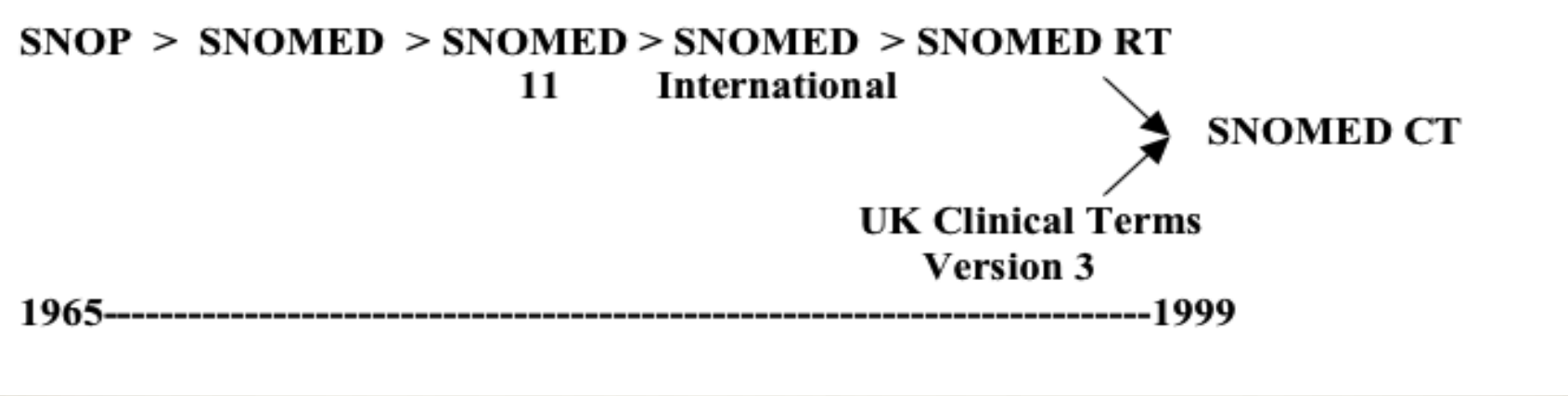
What is SNOMED CT?

"[It] is the most comprehensive, multilingual clinical healthcare terminology in the world." (IHSTDO 2014)

" It is an internationally recognized terminology standard, designed to capture, retrieve, aggregate and share relevant clinical information across health care settings and providers in a consistent, safe and reliable manner." (CHI 2014)

Development of SNOMED CT

National Health Service (NHS)
&
College of American Pathologists (CAP)



International Health Terminology Standard Development Organization

- In 2007, IHTSDO purchased the intellectual property rights to SNOMED CT and it's antecedents from CAP
- Located in Copenhagen, Denmark
- Owns, maintains and distributes SNOMED CT
- Non-profit and has 18 member countries including Canada
- Canada Health Infoway Standards Collaborative is the liaison with IHTSDO for SNOMED CT in Canada

Canada Health Infoway Standards Collaborative

- Chose SNOMED CT as the terminology “standard of choice” for the EHR in 2006
- Responsible for licensing, distribution, implementation, support, management and education of SNOMED CT within Canada
- Manages Canadian extensions of SNOMED CT
  - Developed 35,000 active French Canadian Concepts for SNOMED CT

About SNOMED CT

- Core terminology for the Electronic Health Record (EHR)
- Used in more that 50 countries
- Multilingual
  - US English
  - UK English
  - Spanish
  - Danish
  - Swedish
  - Lithuanian

About SNOMED CT

- Supports the interoperability needed for the EHR
  - Vendor-neutral
  - Platform independent
- Can be cross mapped to classification systems or other terminologies
  - ICD-9-CM
  - ICD-10
  - ICD-0
  - LOINC-*Logical Observation Identifiers Names and Codes*
    - Clinical terminology for laboratory tests and results
- Updated twice a year, January and July

How does it work?

SNOMED CT has 3 core terminology components organized into 19 hierarchies

- Concepts
  - Hierarchies
- Descriptions
- Relationships

Concepts

- A clinical idea to which a unique *Concept Identifier* has been assigned. (IHSTDO 2014)
- Concept Identifier (ConceptID)-unique numerical identifier

Myocardial infarction

ConceptID:22298006

- 311,000 active concepts organized in hierarchies

Hierarchies

- Clinical finding/disorder
- Procedure/Intervention
- Observable entity
- Body structure
- Organism
- Substance
- Pharmaceutical/biologic product
- Specimen
- Special concept
- Physical object
- Physical force
- Event
- Environment or geographical locations
- Social context
- Situation with explicit context
- Staging and scales
- Linkage concept
- Qualifier value
- Record artifact

Hierarchies

- Polyhierarchical-Concept can be in more than one hierarchy.
- Concepts are organized within a hierarchy by granularity or level of detail/specificity.
  - Top concept is the root concept and is the most general or the broadest.
  - Concepts become more granular/detailed towards bottom.

Hierarchies

Clinical finding hierarchy

Top Concept

Increased granularity

Clinical Finding

Disease

Traumatic AND/OR non-traumatic injury

Traumatic injury

Traumatic injury by site

Injury of upper extremity

Hand Injuries

Fracture of hand

Fracture of phalanx of thumb

Descriptions

Words or phrases that represent or describe the meaning of the Concept

Each description has a unique *Description Identifier*

Three types of descriptions:

- Fully Specified Name (FSN)
- Preferred Term (PT)
- Synonym (s)

Descriptions

Fully Specified Name (FSN)

- Unique for each Concept
- Text
- Human readable
- Includes semantic tag
  - Clarifies the meaning of the concept by identifying where it is in the primary hierarchy.

  Pseudoaneurysm (disorder) -> Clinical finding

  Pseudoaneurysm (morphological abnormality) -> Body structure

Descriptions

Preferred term (PT)

- Common term for a disorder or procedure
- Not unique to each Concept
- Can be a Synonym for another Concept

ConceptID: 38102005

FSN: Cholecystectomy (procedure)

PT: Cholecystectomy

Descriptions

Synonyms

- Not unique to each Concept
- One Concept-many synonyms
- Allow flexibility for users

Descriptions for ConceptID 38102005

DescriptionID	Description	Description type
771004017	Cholecystectomy (procedure)	Fully Specified Name
64698015	Cholecystectomy	Preferred term
487885014	Excision of gallbladder	Synonym
487886010	Gallbladder excision	Synonym
1785275017	Removal of gallbladder	Synonym

Relationships

- Link Concepts and logically defines them in relation to each other.
- Formal or computer-readable definitions and characteristics of a concept.
- Each relationship has a unique *Relationship Identifier*

4 types:

- Defining
- Qualifying
- Historical
- Additional

Defining Relationships

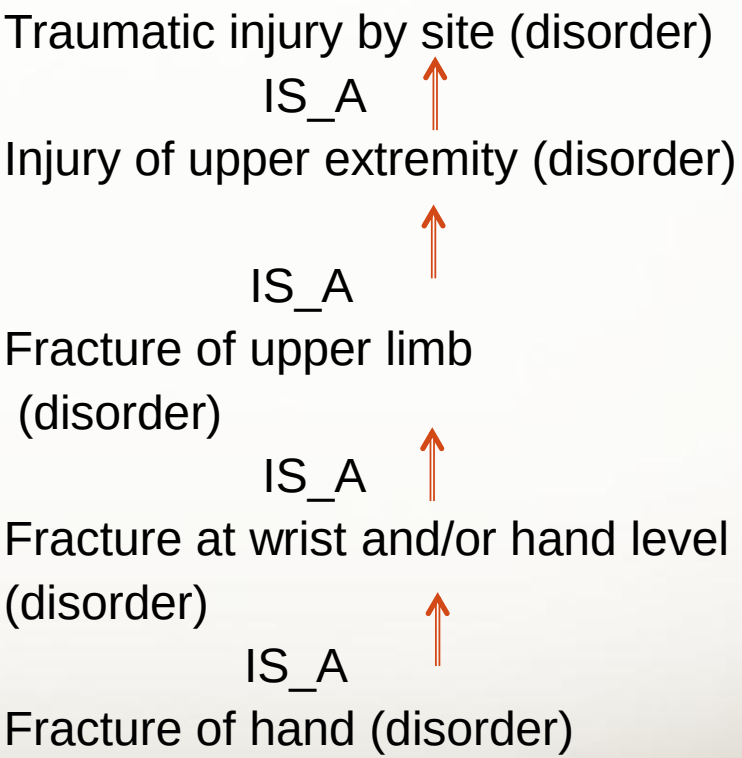
2 types

IS_A

Attribute

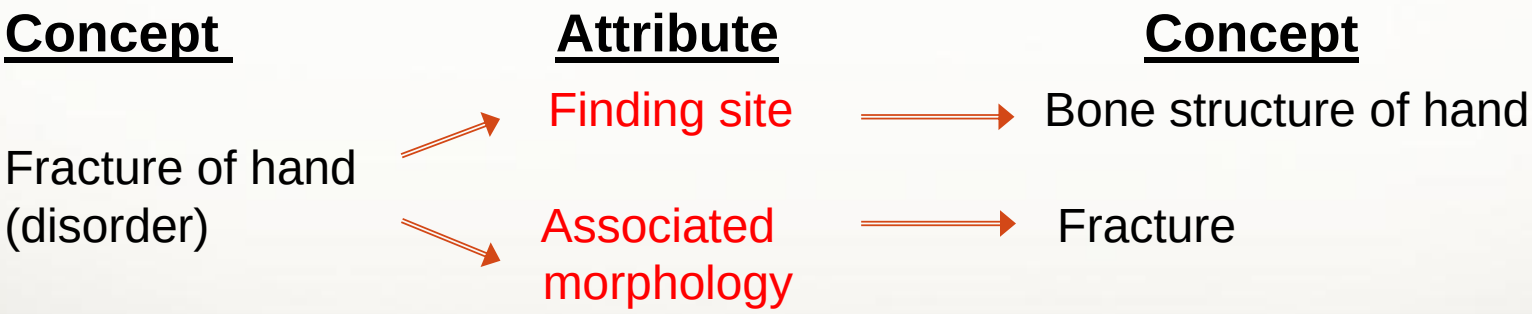
IS_A Relationships

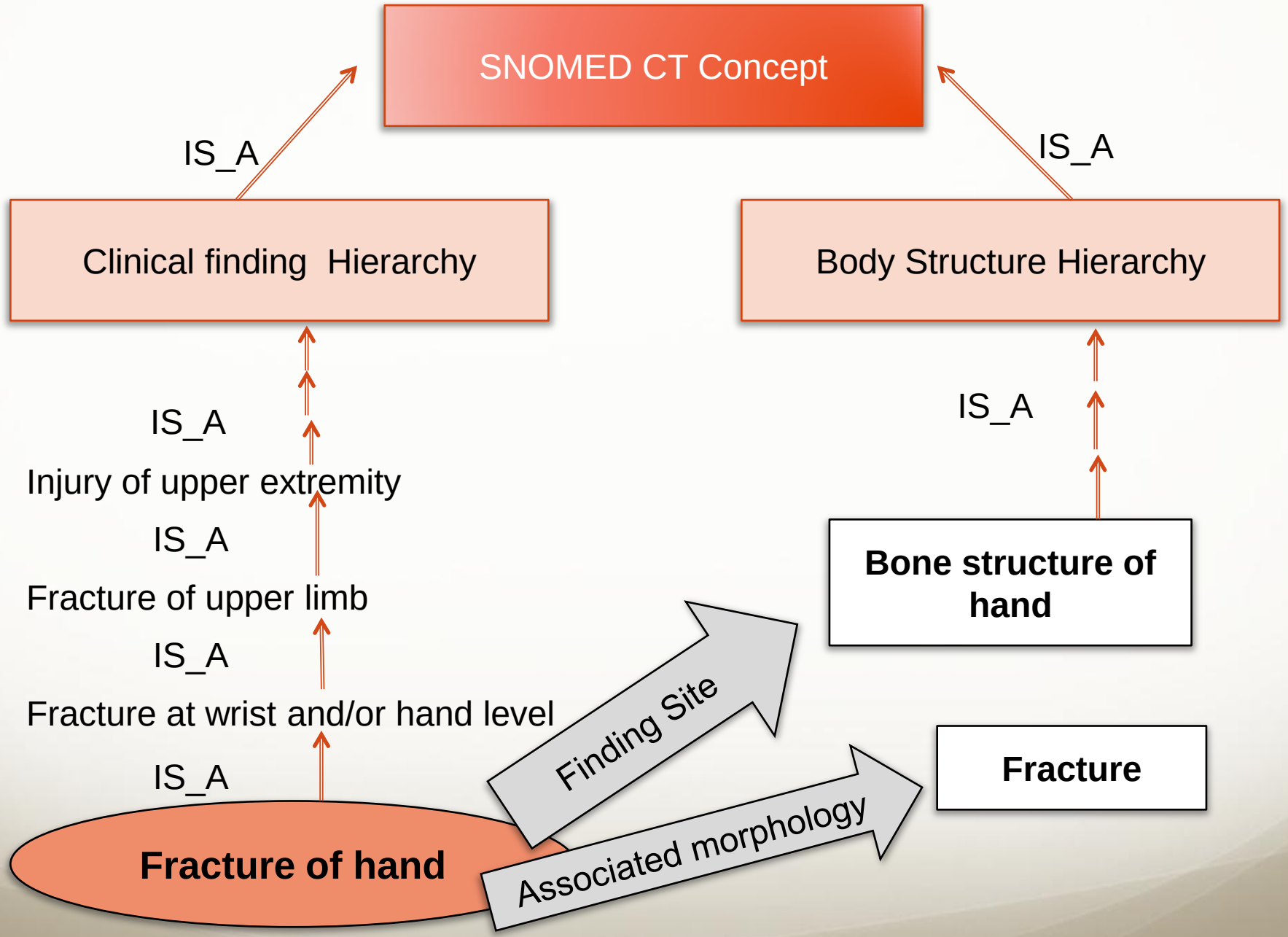
- Defines the relationship within a Hierarchy
- Links a more specific Concept to a more general Concept
- Parent-child, Supertype-subtype



Attribute Relationships

- Links Concepts between different Hierarchies
- Further defines the meaning of the Concept




SNOMED CT Concept
IS_A
IS_A
Clinical finding Hierarchy
Body Structure Hierarchy
IS_A
IS_A
Injury of upper extremity
IS_A
Fracture of upper limb
IS_A
Fracture at wrist and/or hand level
IS_A
Bone structure of hand
Finding Site
Fracture
Associated morphology
Fracture of hand

Relationships

4 Types

- Defining- define Concepts in relation to other Concepts
  - IS_A & Attribute
- Qualifying- non-defining attributes. Add information but don't define a Concept.
  - Left or right
- Historical- relate inactive Concepts to active Concepts
- Additional- other non-defining attributes

Subsets and Extensions

SNOMED CT has over 300,000 concepts

- Subsets
  - Restrict number of available SNOMED CT Concepts
- Extensions
  - Expand number of available SNOMED CT Concepts

Reference Terminology Subsets

- Reference Sets (RefSets)-Subsets
  - A set of Concepts, Descriptions, or Relationships appropriate to a particular purpose
    - Ophthalmology clinic
    - Community care
  - If SNOMED CT were a book, subsets would be a chapter.

Extensions

- Additional Concepts, Descriptions or Relationships to support national, local or organizational needs
- In Canada, extensions are created by Canada Health Infoway Standards Collaborative
  - French Canadian Concepts

Subsets and Extensions

- Subsets and extensions:
  - SNOMED CT is flexible and can be used by facilities ranging from small clinics to large hospitals.
  - Created by authorized organizations and approved by IHSTDO
    - Consistent
    - Interoperable

SNOMED CT and ICD/CCI

SNOMED CT and ICD-10-CA/CCI

- SNOMED CT
  - Clinical Reference Terminology
    - A set of concepts, descriptions and relationships which provide a common reference point for comparison and aggregation.
    - Every concept has a formal, machine-usable definition.
  - Nomenclature
    - A naming system using pre-established rules that creates a standardized terminology
    - Codes can be assigned to the terminology
    - Codes can be combined to create more complex codes

SNOMED CT and ICD-10-CA/CCI

- The International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada (ICD-10-CA)
- Canadian Classification of Health Interventions (CCI)
  - Classifications
    - "…an ordered system of concepts based on classes or categories within a domain, with implicit or explicit ordering principles. The ways in which classes are defined depends on their intended use. All possible codes are predefined…" (Abrams & Gibson, 2013, p. 57).
    - Diagnosis, procedures and related entities are organized into categories.
    - All possible codes are predefined
      - Cannot combine codes to create more complex codes

SNOMED CT and ICD-10-CA/CCI

- SNOMED CT
  - More granular
  - Multiple levels of detail allows clinicians to enter clinical data at the level of detail required for the stage of care and not lose their intended meaning.
  - Multiple levels of detail can make secondary uses more cumbersome
  - Point of Service (PoS)
- ICD-10-CA/CCI
  - Not designed for input into the EHR .
  - Designed for statistical analysis/output
    - Morbidity and Mortality statistics
  - After PoS

Urinary tract infection

ICD-10-CA	SNOMED CT	Description
N39.0	68566005	Urinary tract infection
N39.0	197927001	Recurrent urinary tract infection
N39.0	431309003	Urinary tract infection, acute
N39.0	197928006	Chronic urinary tract infection

Pneumonia

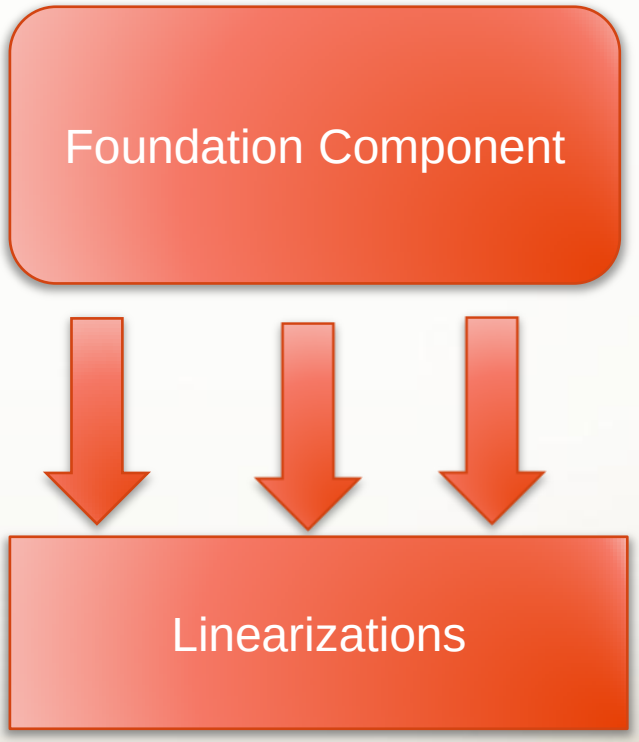
ICD-10-CA	SNOMED CT	Description
J18.9	233604007	Pneumonia
J18.9	407671000	Bilateral pneumonia
J18.9	300999006	Basal pneumonia
J18.9	233606009	Atypical pneumonia

SNOMED CT and ICD
The future

- World Health Organization (WHO) and IHTSDO created a collaboration in 2010 to harmonize and integrate SNOMED CT and ICD classifications
  - Build maps and linkages between SNOMED CT and ICD
  - Goal to improve coding and information exchange
  - ICD-11 revision will include SNOMED CT

ICD-11

- Built for the EHR
- Release in 2017
- Two level architecture
  - Foundation Component
    - Harmonized with SNOMED CT
  - Linearizations
    - Similar to current ICD-10-CA structure.
    - Linked to the Foundation Component



Summary

- SNOMED CT
  - Nomenclature and clinical reference terminology developed for the EHR.
  - 3 core components
    - Concepts-organized in Hierarchies
    - Descriptions
    - Relationships

Summary

- SNOMED CT
  - Flexible
    - Subsets
    - Extensions
- Different from ICD/CCI
  - Classifications
- ICD-11
  - Harmonized with SNOMED CT

Roles for HIM

Roles for HIM

- Terminology and Classification specialists
- Clinical vocabulary manager
  - Standardizing naming conventions
- Project manager in implementation of the EHR
- Mapping
  - SNOMED CT and ICD/CCI
  - Local terms to SNOMED CT
  - Local terms to User interface terminology
  - User interface terminology to SNOMED CT
  - Paper forms to electronic forms

Roles for HIM

- Informatics
- Change management
- Standardizing local terminologies
  - Encoding health care data at the source
- Liaison between the clinicians and IT.
- Create clinical documentation templates
  - Problem lists for drop down menus
- Privacy and security of the EHR

Educational resources

Canada Health Infoway https://www.infoway-inforoute.ca/

IHSTDO http://www.ihtsdo.org/

CHIMA https://www.echima.ca/home

WHO-ICD 11
http://www.who.int/classifications/icd/revision/en/
ICD-11 beta draft
http://apps.who.int/classifications/icd11/browse/l-m/en

Questions?

References

https://uts.nlm.nih.gov//home.html

https://www.infoway-inforoute.ca/

http://www.ihtsdo.org/

http://www.who.int/classifications/icd/en/