Applying visualization to support coherent terminology implementation

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Oktober 2012
Motivation for terminology implementation

TERMINOLOGY

Sharing
Retrieval
Aggregation

Effects
Navigation, concept selection, overview!
Why common terminology is not enough?

... Analyzing SNOMED CT

Example:

Physical examination template

Ear: ... ...
Nose: ... ...
Throat: ... ...

SNOMED CT Concept

Observable entity

Ear, nose / throat observable

Ear observable

Clinical finding

Finding of face

Finding of nose

Body structure

Neck structure

Throat
Why common terminology is not enough?

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Example:

Physical examination template

Ear: ... ...
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SNOMED CT Concept

Clinical finding

Finding of head and neck region

Throat finding
Nose finding
Ear finding
SNOMED CT Concept

Clinical finding

Finding of head and neck region

- Finding of nose
- Ear finding
- Throat finding

Least common parent

SNOMED CT Concept

Observable entity

Clinical finding

Body structure

- Neck structure
  - Throat

Ear, nose / throat observable

Ear observable

Finding of face

Finding of nose
Balancing specificity and comparability
How to support comparability?
How to support comparability?

1. Mapping guidelines
   • Common strategy for navigating the SNOMED CT hierarchies and selecting sufficient concepts.*

2. Terminology visualisation tool
   • Overview of ‘local’ terminology with respect to the structure and content of SNOMED CT.

*[“SNOMED CT implementation: Mapping Guidelines facilitating reuse of data”, A. Rasmussen, K. Rosenbeck Gøeg, Methods Inf Med 2012, 51.]
Work process

Research group
(SNOMED CT experts)

Medical staff / EHR end users

EHR – implementation team
Manuel visualisations
Example: Nusing status

- SNOMED CT
  Concept
  - Clinical finding
    - Finding by method
    - History finding
    - Functional finding
    - Communication, speech and language finding
    - Housing, local environment and transport finding
  - Clinical history and observation findings
    - Fund vedr. almindelig daglig livsførelse
    - Fund vedr. tale og sprog
    - tolk påkrævet
  - Environmental finding
  - Legal, financial, employment and/or socioeconomic history finding
  - Employment finding
  - Family details and household composition - finding
  - Administrative statuses
  - Patient encounter status
  - Need for interpreter

- Fund ved anamnese vedr. sociale og personlige forhold
  - fund vedr. religiøst tilhøringsforhold
  - fund vedr. personlig status
    - fund vedr. ægteskabelig- eller partnerskabsstatus
  - fund vedr. bopæls- og boligforhold
  - fund vedr. beskæftigelsesstatus
  - beskæftigelse shistorie
Method

- **SNOMED CT Concept**
  - **Body structure**
  - **Physical anatomical entity**
  - **Anatomical or acquired body structure**
- **Anatomical structure**
- **Body tissue structure**
- **Body system structure**
- **Soft tissues**
- **Structure of cardiovascular system**
- **Body organ structure**
- **Blood vessel structure**
Method

SNOMED CT Concept

Body structure

Physical anatomical entity

Anatomical or acquired body structure

Anatomical structure

Body region structure

Body system structure

Body part structure

Structure of cardiovascular system

Regional cardiovascular structure

Trunk structure

Cardiovascular structure of trunk

SNOMED CT Concept

Body structure

Physical anatomical entity

Anatomical or acquired body structure

Anatomical structure

Body region structure

Body system structure

Body part structure

Structure of cardiovascular system

Regional cardiovascular structure

Trunk structure

Soft tissues

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Body organ structure

Blood vessel structure
Method

- SNOmed CT Concept
  - Body structure
    - Physical anatomical entity
    - Anatomical or acquired body structure
  - Anatomical structure
    - Body region structure
    - Body part structure
      - Regional cardiovascular structure
    - Trunk structure
      - Cardiovascular structure of trunk

- SNOmed CT Concept
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    - Physical anatomical entity
    - Anatomical or acquired body structure
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      - Structure of cardiovascular system
    - Body tissue structure
      - Soft tissues
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    - Body organ structure
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Method

SNOMED CT Concept

Body structure

Physical anatomical entity
Anatomical or acquired body structure

Anatomical structure

Body system structure

Structure of cardiovascular system

Regional cardiovascular structure
Blood vessel structure
Cardiovascular structure of trunk
Potential of visualization

- Overview of concepts and their relations
- Compare single concepts
- Compare groups of concepts
Potential of visualization

**Overview** of concepts and their relations

- Nutritional finding
- Reproductive finding
- Finding relating to sexuality and sexual activity
- Communication, speech and language finding
- Finding relating to psychosocial functioning
- Cognitive function finding
- Sleep rest pattern finding
- Elimination pattern
- Value belief finding
- Pain
- Observation of sensation
- Finding of functional performance and activity
- Mucosal finding
- Skin finding
- Finding of respiration
- Cardiovascular finding
Potential of visualization

• **Compare** single concepts
Potential of visualization

- **Compare** groups of concepts
Potential of visualization

SNOMED CT Concept

Clinical finding

Finding by site

Mucosal Finding

Neurological finding

Sensory nervous system finding

Pain / sensation finding

Skin Finding

Integumentary system finding

Finding of body region

Respiratory finding

Finding of respiration

Blood vessel finding

Cardiac finding

Cardiac finding

Pain

Observation of sensation

finding of sense of smell

finding of sense of taste

Pain

Asthma finding

Chronic obstructive pulmonary disease finding

Template A

Template B
Potential of visualisation

• Support collaboration within the EHR-implementation process
  • Starting point for discussions/-collaboration on EHR-content
  • Common reference and overview of all content for all actors

→ Making content transparent!
Future work

- Development and evaluation of:
  - Automatic visualization
  - Dynamic tool
Thank you! ... for your attention!