HIMSS NURSING INFORMATICS
Empowered Care Through Leadership and Technology

Introduction to SNOMED CT for Nurses

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Webinar Presentation given to the HIMSS USA Nursing Informatics Work Group

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Objectives

- Understand the core components (concepts, descriptions, relationships) of SNOMED CT.
- Describe how to use SNOMED CT to code concepts in an electronic health record.
- Describe the relationships between SNOMED CT and the other ANA recognized nursing terminologies.
- Propose a strategy for using the SNOMED CT encoded Nursing Problem List Subset to meet Meaningful use criteria.

SNOMED® CT

The Systematized Nomenclature of Medicine – Clinical Terms

SNOMED Milestones

- SNOP – 1965 – basis for ICD-O
- SNOMED – 1974
- SNOMED II – 1979
- SNOMED Version 3.0 – 1993
- SNOMED Version 3.5 – 1998
- SNOMED RT – 2000 (Merge with UK NHS)
- SNOMED CT (SNOMED RT + CTV3) – 2002
- Agreement with NLM – June 2003
- International Health Terminology SDO (IHTSDO) 2007

What is SNOMED CT?

- A work of clinical terminology for coding, retrieving and analyzing data about health and health care
- Comprised of codes, terms and relationships, for use in precisely recording and representing clinical information across the scope of health care
- Concept-based: Each code represents a single meaning and can have multiple descriptions (terms)

SNOMED Structural Overview

Susan Matney

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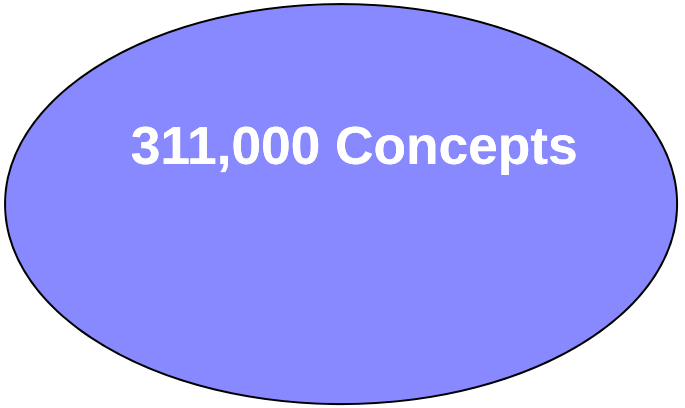
Rich Clinical Content

- Finding/disorder (Diseases)
- Procedure/intervention
- Body structure
- Organism
- Specimens
- Pharmaceuticals
- Substances
- Physical objects
- Observable entity
- Staging/scales
- Events
- Social/administrative concepts
- Environment/geographic locations



SNOMED CT Structure

- **Hierarchies**
- **Parent child relationships**
  - **Vertical structure**
  - **Concept may have multiple parents**
- **Relationships between concepts**
  - **Using attributes, concepts may be linked to each other**
  - **Horizontal relationships**

Basic Elements of SNOMED CT

- **Concepts**
- Hierarchies
- Relationships
- Descriptions

Concept

- The basic unit of SNOMED CT
- Any clinical concept to which a unique Concept Identifier has been assigned
- Concept IDs are permanent

Concept

- A single clinical meaning identified by a unique numeric identifier (ConceptID) that never changes, with a unique human readable name (Fully Specified Name)
- Associated with each concept is a set of relationships to other concepts (the “logical definition”) and a set of names or terms

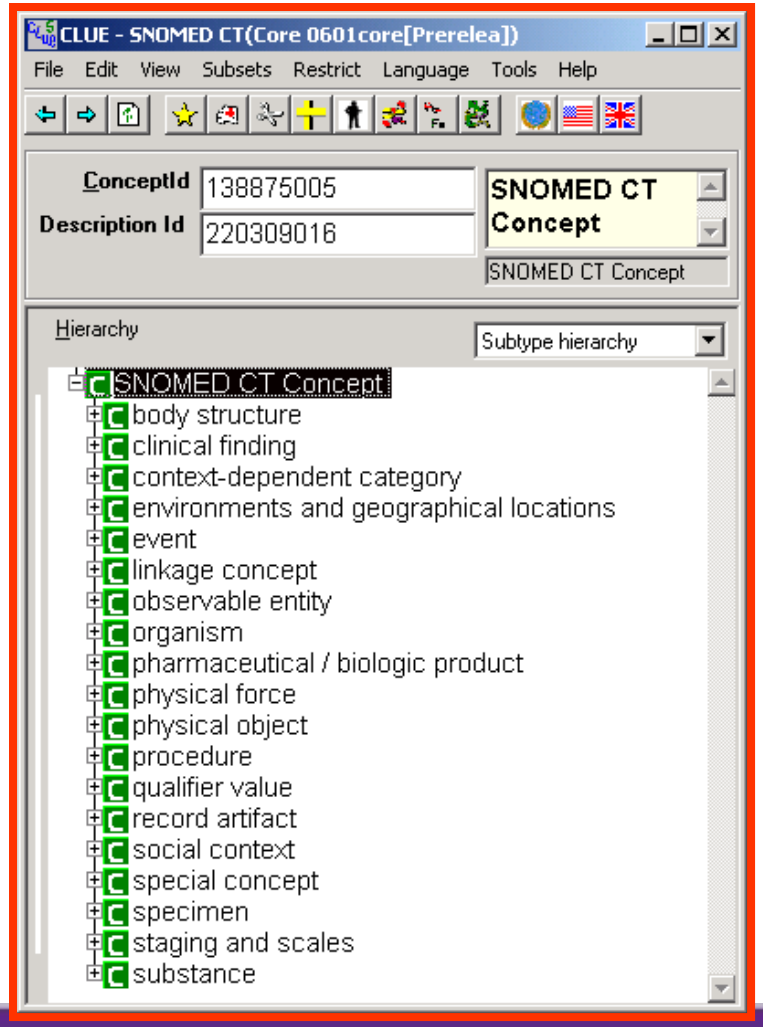
Gastric ulcer 397825006

- Terms:
  - Gastric ulcer (disorder)
  - Gastric ulcer
  - Stomach ulcer
  - GU – Gastric ulcer
  - Gastric ulceration
- Relationships:
  - Is_a → Disease of stomach
  - Is_a →Gastrointestinal ulcer
  - Associated morphology → Ulcer
  - Finding site → Stomach

Basic Elements of SNOMED CT

- Concepts
- **Hierarchies**
- Relationships
- Descriptions

Hierarchies



19 upper level hierarchies

Each hierarchy has sub-hierarchies

Hierarchies

- Top-level hierarchies – Primitives
- Each hierarchy has sub-hierarchies
- A code in SNOMED CT can reside in more than on sub-hierarchy of a top-level hierarchy

SNOMED CT Hierarchy Structure

- **Multiple levels of granularity**
- **Allow for data capture and aggregation**
- **Most specific concept is found at the bottom of a hierarchy**

Multiple Levels of Granularity

Malignant neoplastic disease (disorder)

↑ Is_a

Malignant neoplasm of omentum (disorder)

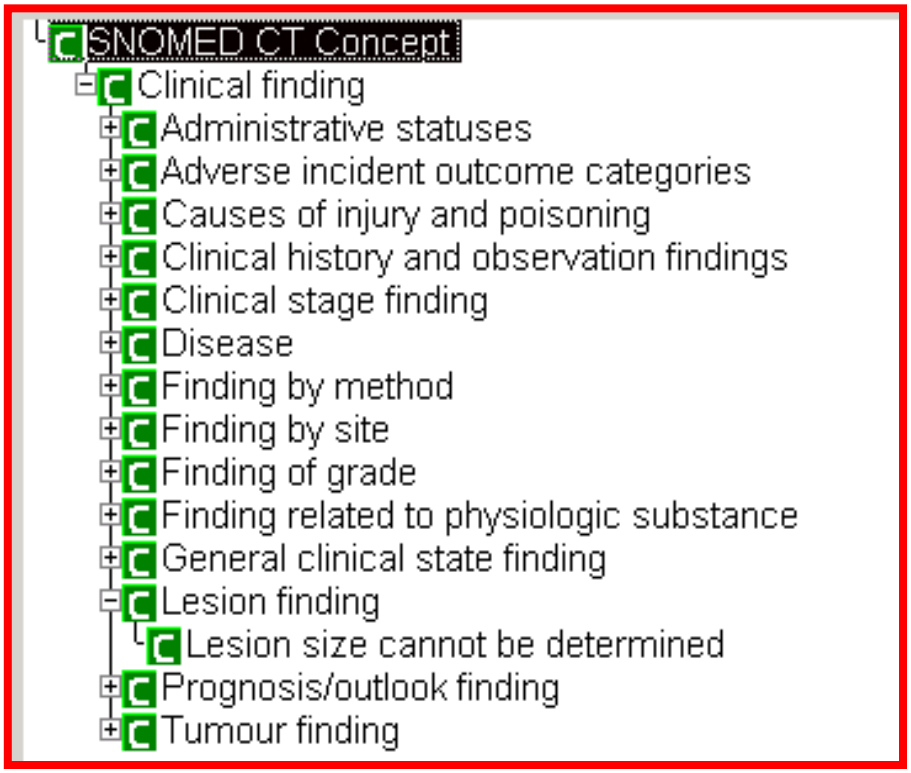
↑ Is_a

Primary malignant neoplasm of the omentum (disorder)

SNOMED CT Hierarchy Examples

- Clinical Finding
- Procedure
- Body Structure
- Observable Entity
- Pharmaceutical Products

Clinical Finding



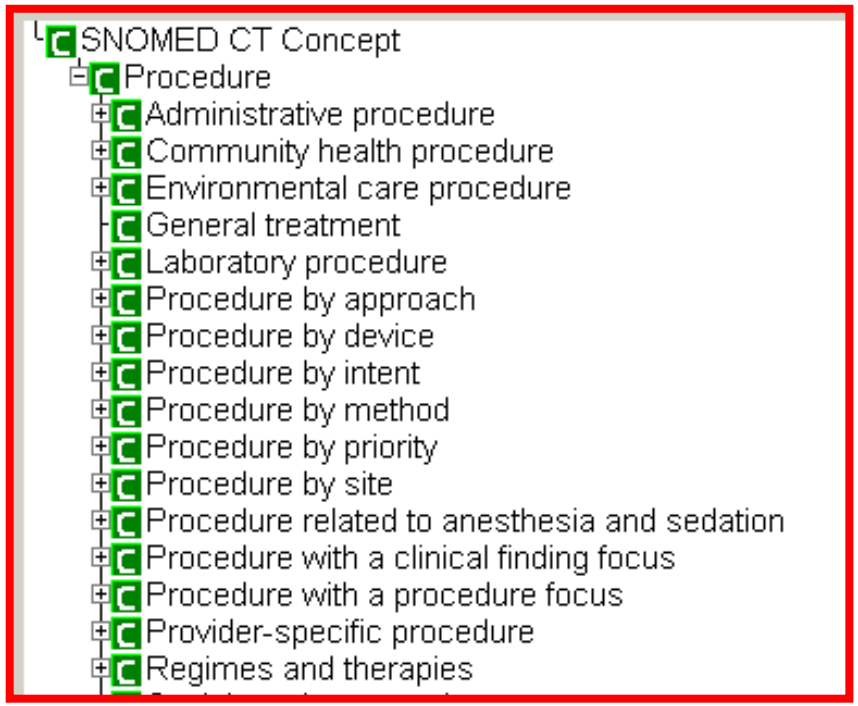
The result of a clinical observation, assessment or judgment

The sub-hierarchy of "Disease" represents those concepts that are necessarily abnormal

Disease/Disorder

- Tuberculosis (disorder)
- Non-Hodgkin's lymphoma (disorder)
- Congenital cystic kidney disease (disorder)
- Hypertrophic cardiomyopathy (disorder)
- Fluoride allergy (disorder)
- Peanut-induced anaphylaxis (disorder)

Procedure

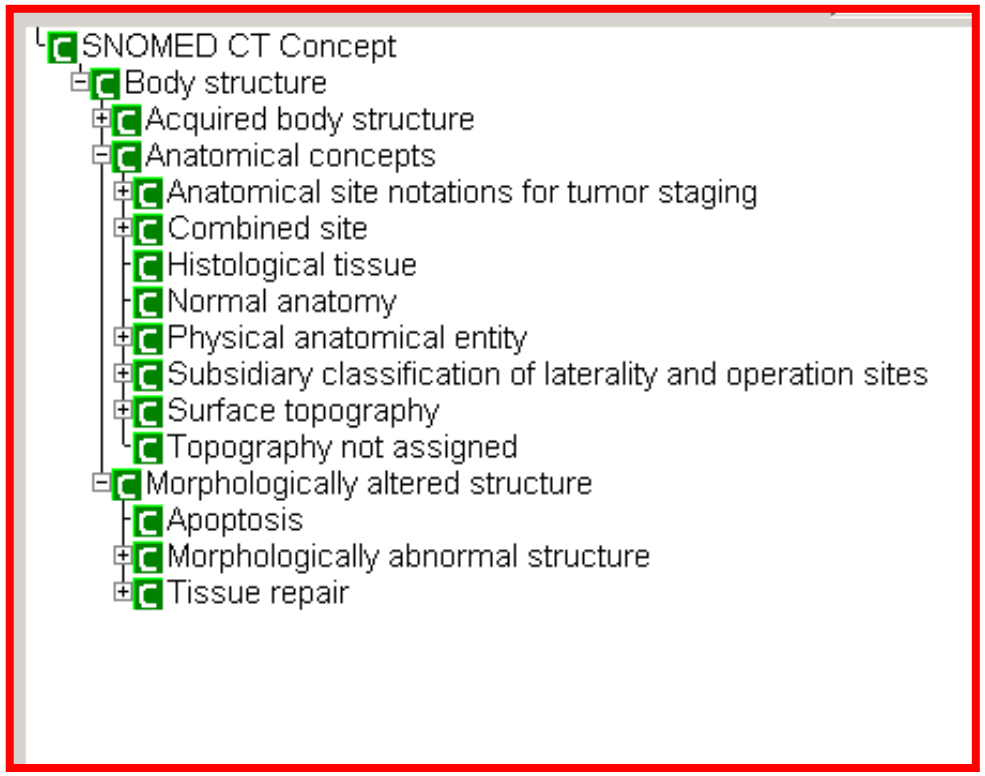


Represent actions performed in the provision of health care; includes administrative, invasive, diagnostic, and education procedures

Procedure

- Removal of ureteral catheter (procedure)
- Intravenous steroid injection (procedure)
- Irrigation of oral wound (procedure)
- Appendectomy (procedure)
- Alanine aminotransferase measurement (procedure)
- Creatinine clearance test (procedure)

Body Structure



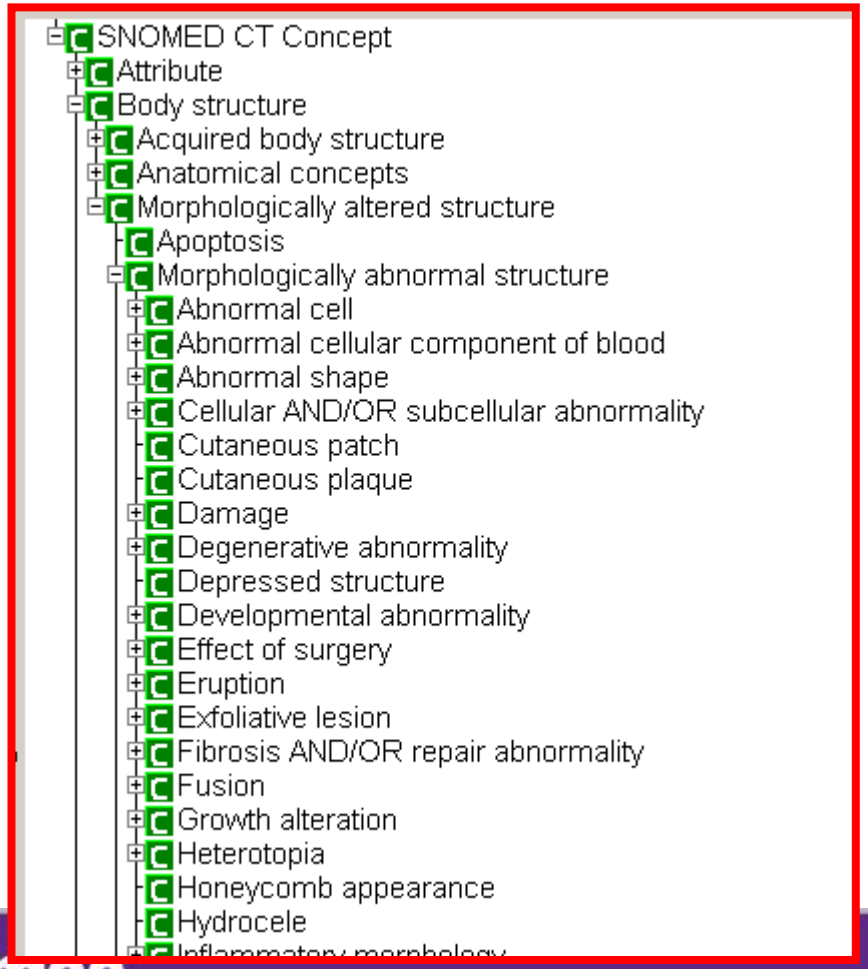
"Body structure" includes normal and abnormal structures

Anatomical concepts used to specify the site of a "Procedure" or of a "Clinical finding" are found in this hierarchy

Body Structure

- Lobe of liver (body structure)
- Mitral valve structure (body structure)
- Cecum structure (body structure)
- Bone structure of sternum (body structure)

Morphologic Abnormality



Sub-hierarchy of "Body structure"

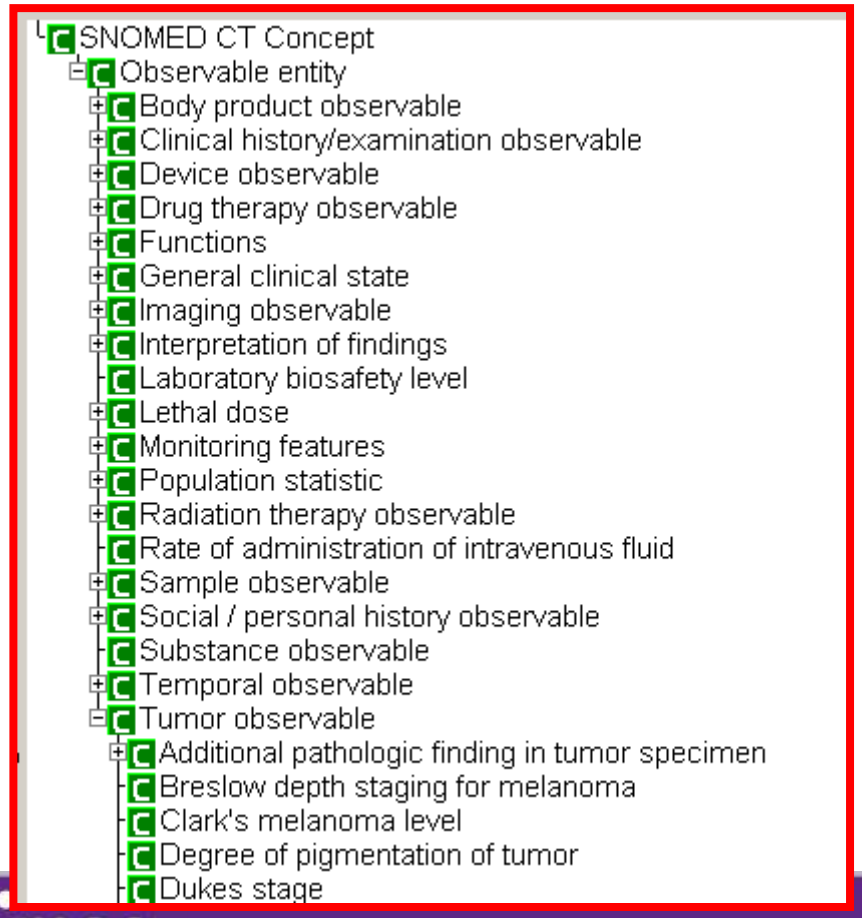
Used in "Clinical findings" concepts as value of "Associated morphology"

Used in "Procedure" concepts as the value of "Procedure morphology"

Morphologic Abnormality

- Polyp (morphologic abnormality)
- Plaque (morphologic abnormality)
- Hydrocele (morphologic abnormality)
- Adenosarcoma (morphologic abnormality)

Observable Entity



Represent a question that could be asked (or a procedure performed), that yields an answer or result; used in templates and forms

Observable Entity

- Blood pressure (observable entity)
- Heart rate (observable entity)
- Tumor weight (observable entity)
- Patient age (observable entity)

Basic Elements of SNOMED CT

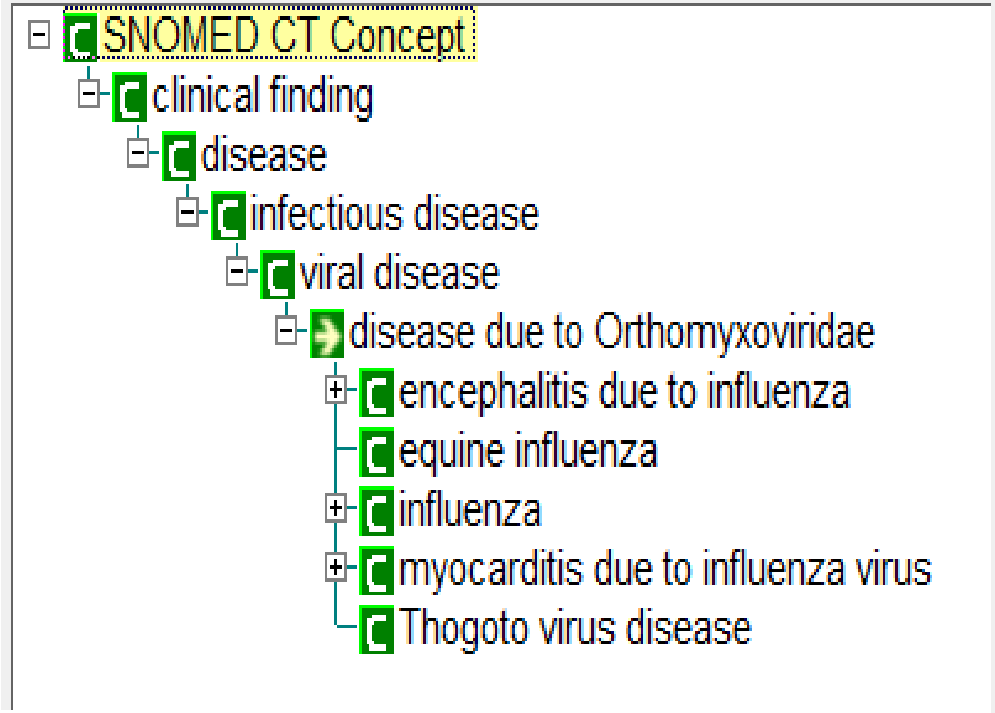
- Concepts
- Hierarchies
- **Relationships**
- Descriptions

SNOMED CT hierarchies
The best of both worlds

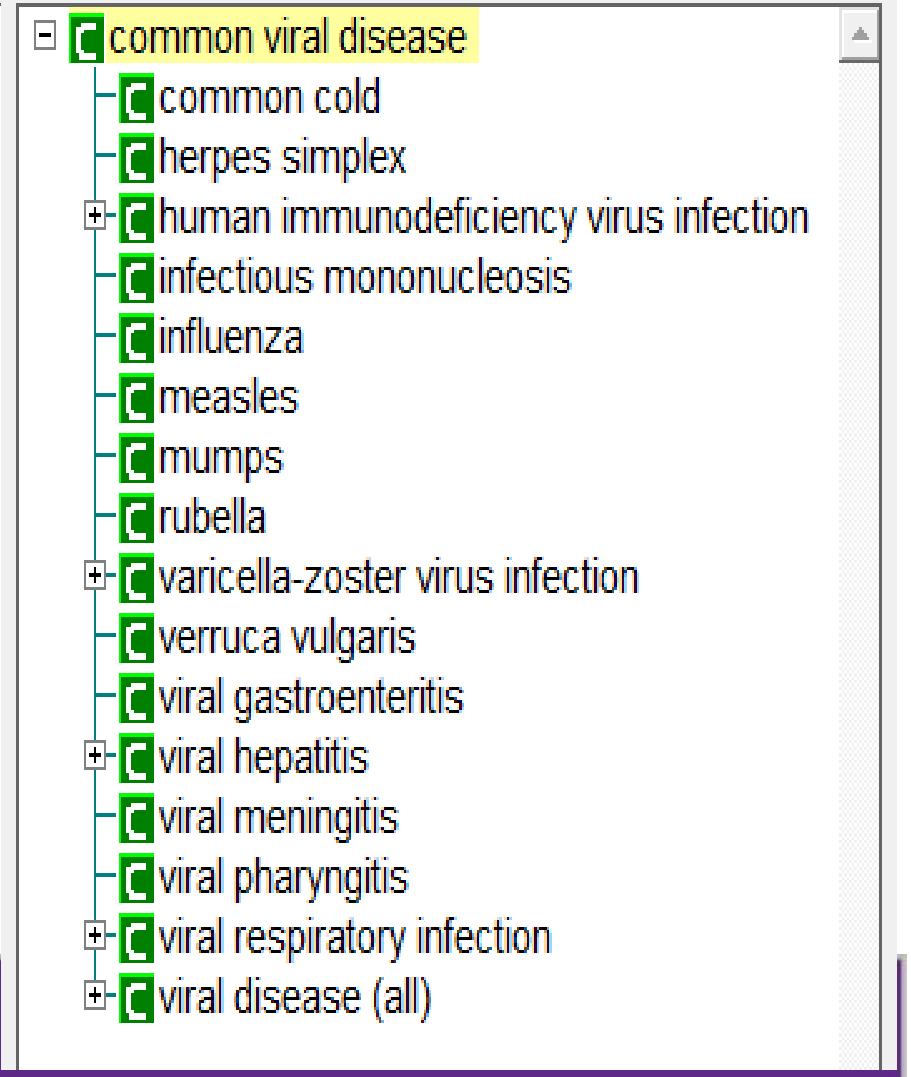
- SNOMED CT has Reference features
  - For effective precise and complete retrieval it needs to represent the subsumption of concepts by one another
  - The subtype hierarchy is derived by auto-classification to meet this requirement
- SNOMED CT has Interface features
  - At the user interface the auto-classified subtype hierarchy is not intuitive
  - Separate navigation hierarchies address the interface requirement without compromising the subtype hierarchy
- Navigational hierarchies are represented as RefSets
  - They can be created to meet specific user needs
  - They need not represent subtypes or logical relationships

Hierarchies and usage

Subtypes (automatic)



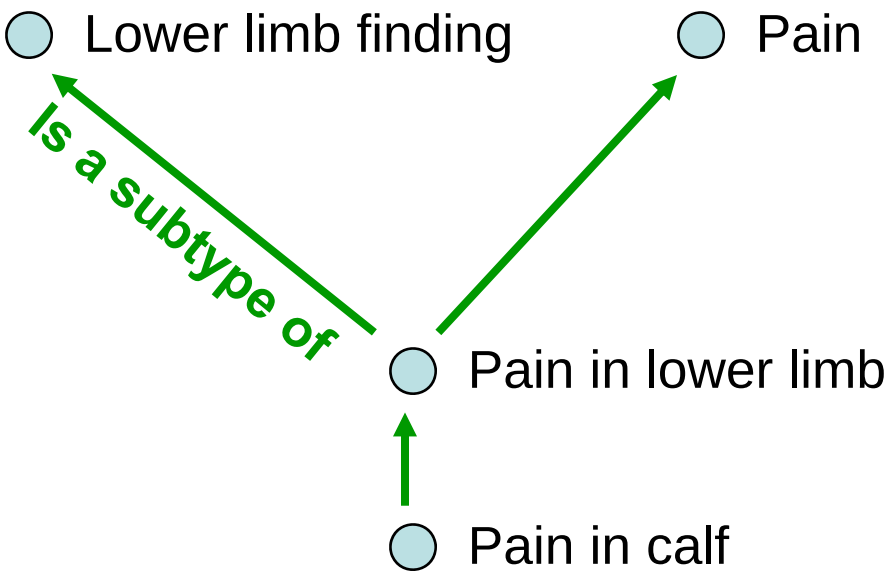
Navigation (hand-crafted)



Subtype relationships

- Every concept is a refined type of one or more other concepts
- For example
  - "Pain in the leg" is a type of "pain"
  - "Pain in the leg" is a type of "lower limb finding"
- SNOMED CT represents these defining relationships with the relationship type **"is a"**

Subtype relationships



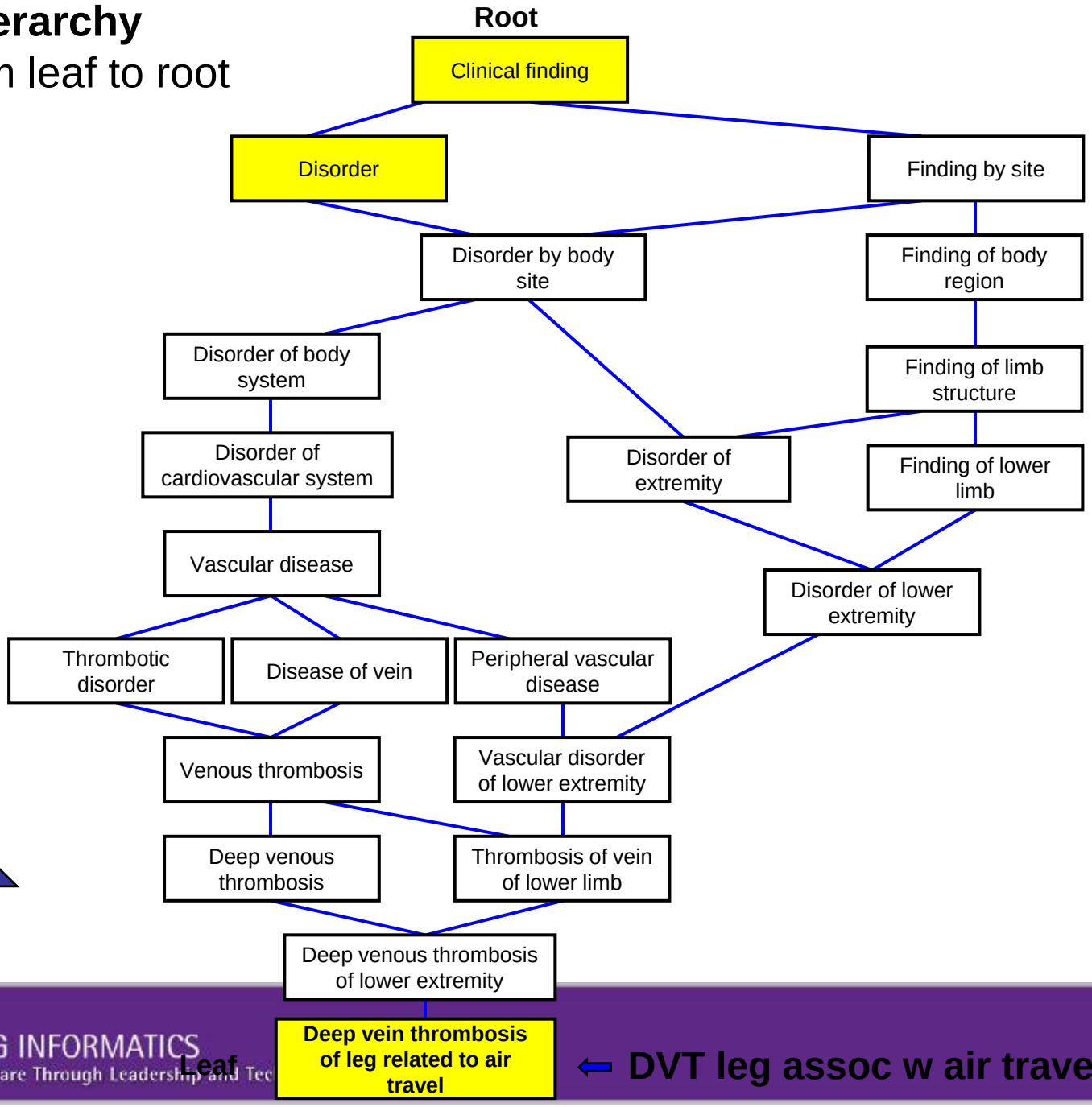
A pain in the calf *is-a* pain the lower limb, and
Pain in the lower limb *is-a* pain, and *is-a* lower limb finding

Why have subtype relationships?

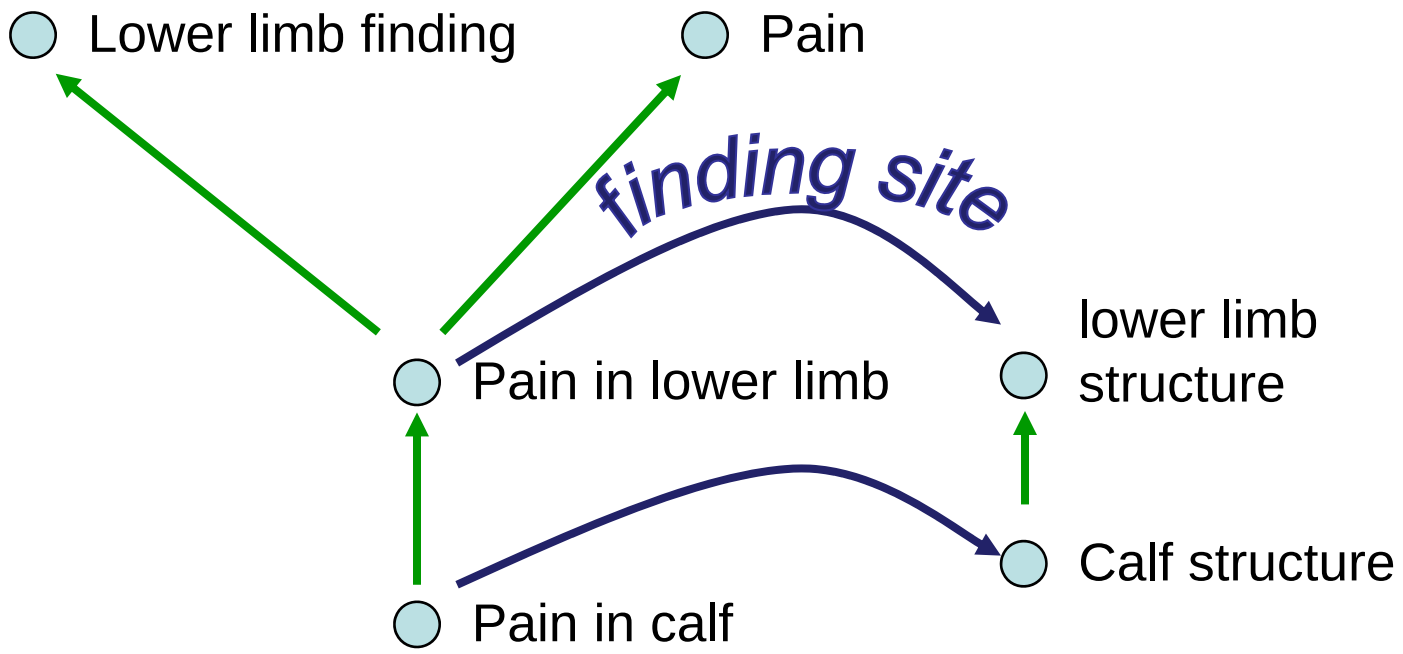
- Because when you selectively retrieve information you usually want to include subtypes
- For example
  - When searching for “Deep Venous Thrombosis” you would usually want to retrieve all kinds of DVT including …
    - DVT of specific sites (e.g. lower limb)
    - DVT with particular causes (e.g. air travel related DVT)
    - and others

Subtype hierarchy

Looking from leaf to root



Other defining relationships



A pain in the calf *has finding site* calf

Pain in the lower limb *has finding site* lower limb

Why have other defining relationships?

- Confirm and enhance the accuracy of the subtype hierarchy

  For example

  – Any concept with the following relationships
    - "is a" → "pain"
    - "finding site" → "lower limb structure" (or a subtype of lower limb structure)
  – Is by definition a subtype of "lower limb pain"

Why have other defining relationships?

- Enable concepts to be refined by increasing the specificity of a defined relationship

  <u>For example</u>

  – The concept “pain in the foot” is defined as
    - “is a” → “pain”
    - “finding site” → “foot structure”
  – The “finding site” relationship can be refined to specify a more precise “finding site”
    - “finding site” = “third toe of the left foot”
  – Allows specific meanings that are not in a SNOMED CT release to be expressed in

Basic Elements of SNOMED CT

- Concepts
- Hierarchies
- Relationships
- **Descriptions**

Descriptions

Terms or names assigned to a concept

Each concept has:

- Fully Specified Name (FSN)
- Preferred Term (display term)

Concept may have:

- One or more synonyms

FSN vs. Preferred Term

Example: Concept ID: 22298006

Preferred term: Myocardial infarction

Fully specified name: Myocardial infarction (disorder)

Example: Concept ID: 54987000

Preferred term: Choledochoplasty

Fully specified name: Repair of common bile duct (procedure)

For the second example, the Preferred Term expresses the natural way a clinician describes this procedure while the FSN give a more unambiguous phrase for the concept's meaning

Is SNOMED CT perfect?

- "The man who makes no mistakes does not usually make anything."
  - E J Phelps (1822 - 1900)
- … so SNOMED CT is not "perfect"
- The goal is fitness for purpose not perfection
  - SNOMED CT is fit-for-purpose
  - SNOMED CT has no equals or close competitors
  - SNOMED CT is the focus of International clinical terminology development

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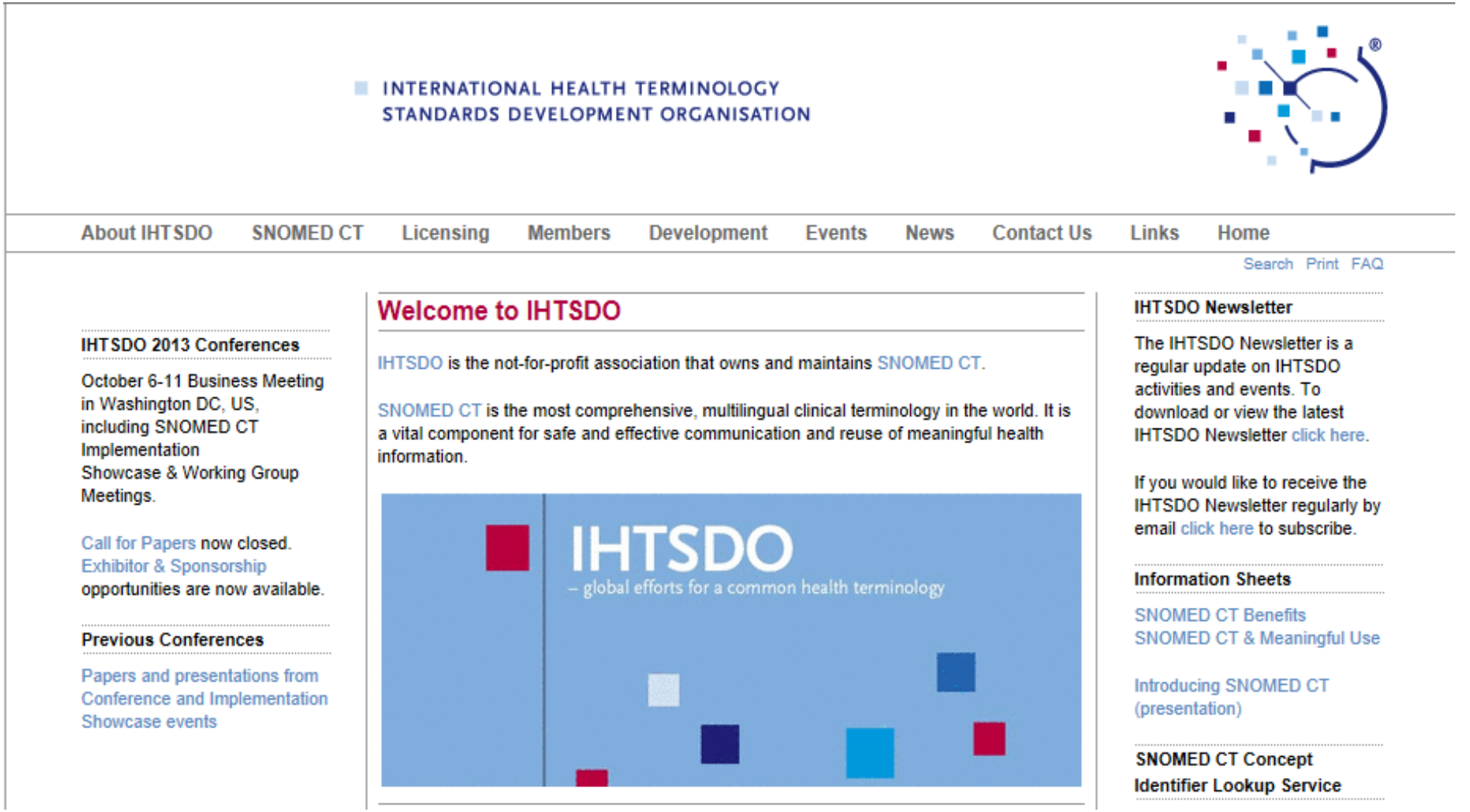
IHTSDO Work Groups

Judith Warren



http://www.ihtsdo.org

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- Working Groups
  - Special Interest Groups
  - Project Groups
- Harmonization

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Special Interest Groups (SIGs)

Special Interest Groups (SIGs) are open to all who are interested. They cover a general topic area but do not start and stop as specific projects come and go. They are ongoing bodies that examine issues related to their specified topics relevant to the interests of IHTSDO and its members and community. Each Special Interest Group reports to a specific Standing Committee, as specified below.

Current SIGs include:

- **Topic Based SIGs**
  - Concept Model (Content Committee & Technical Committee) - Co-chairs Stan Huff & Andrew James
  - Education (Implementation & Innovation Committee) - Chair Sarah Ryan
  - Implementation (Implementation & Innovation Committee) - Chair Jay Kola, Vice-Chair Beverly Knight
  - Mapping (Technical Committee) - Chair Jim Campbell, co-chairs Kin Wah Fung & Kathy Giannangelo
  - Translation (Quality Assurance Committee) - Chair Jane Howarth, co-chair Karin Ahlzen.

- **Professional Specialty SIGs**
  - Anesthesia (Implementation & Innovation Committee) - Chair Andrew Norton
  - Dentistry (Content Committee) - Chair Mark Jurkovich
  - International Family Practice/General Practice (Content Committee) - Chair Nick Booth
  - International Pathology & Laboratory Medicine (Implementation & Innovation Committee) - Chair Alexis B. Carter
  - Nursing (Implementation & Innovation Committee) - Chair Susan Matney
  - Pharmacy (Content Committee) - Co-chairs Emma Melhuish and Leonora Grandia

If you would like to participate in any of these groups we would be pleased to have you.

To join a Special Interest Group and gain access to collaborative materials produced by that SIG please follow the instruction below:

- Register for an IHTSDO Collabnet account (click here to register);
- Log in to your account;
- Visit the relevant SIG home page (using one of the links) above;
- Click the "Join this Project" button to the left of the SIG front page.

Documents to download

Anesthesia SIG Report to the Content Committee October 2009

Concept Model SIG report to the I & I Committee October 2009

Education SIG report to the Quality Assurance Committee October 2009

International Family Practice/General Practice SIG report to the Content Committee April 2010

International Pathology & Laboratory Medicine SIG report to the Content Committee April 2010

Implementation SIG report to the I & I Committee April 2010

Mapping SIG report to the Technical Committee April 2010

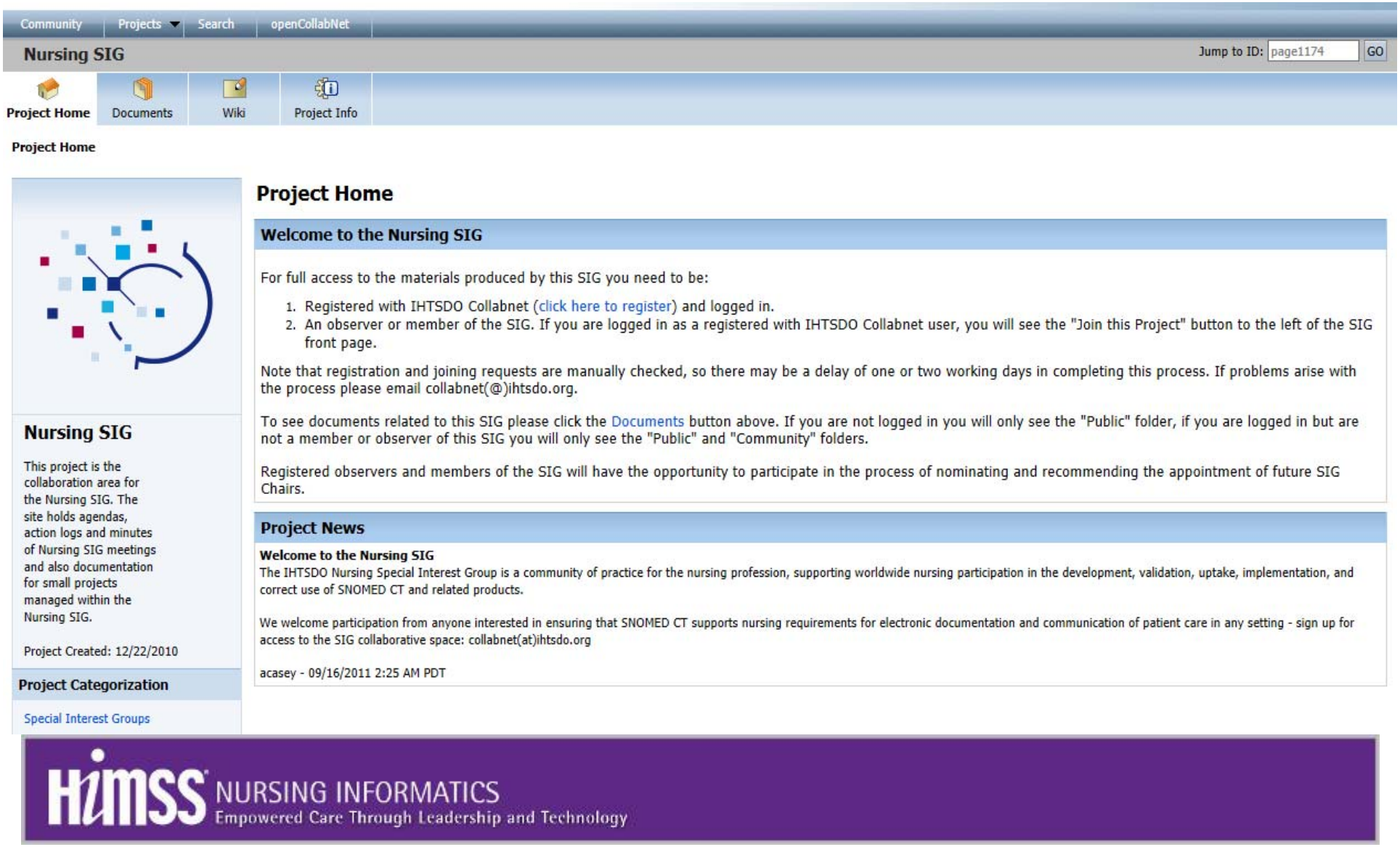
Nursing SIG Terms of Reference April 2011

Nursing SIG report to the I & I Committee April 2011

Nursing SIG report to the Content Committee October 2009

Pharmacy SIG report to the Content Committee October 2009

Nursing SIG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This project is the collaboration area for the Nursing SIG. The site holds agendas, action logs and minutes of Nursing SIG meetings and also documentation for small projects managed within the Nursing SIG.
Project Created: 12/22/2010
Project Categorization
Special Interest Groups
Project Home
Welcome to the Nursing SIG
For full access to the materials produced by this SIG you need to be:
1. Registered with IHTSDO Collabnet (click here to register) and logged in.
2. An observer or member of the SIG. If you are logged in as a registered with IHTSDO Collabnet user, you will see the "Join this Project" button to the left of the SIG front page.
Note that registration and joining requests are manually checked, so there may be a delay of one or two working days in completing this process. If problems arise with the process please email collabnet(@)ihtsdo.org.
To see documents related to this SIG please click the Documents button above. If you are not logged in you will only see the "Public" folder, if you are logged in but are not a member or observer of this SIG you will only see the "Public" and "Community" folders.
Registered observers and members of the SIG will have the opportunity to participate in the process of nominating and recommending the appointment of future SIG Chairs.
Project News
Welcome to the Nursing SIG
The IHTSDO Nursing Special Interest Group is a community of practice for the nursing profession, supporting worldwide nursing participation in the development, validation, uptake, implementation, and correct use of SNOMED CT and related products.
We welcome participation from anyone interested in ensuring that SNOMED CT supports nursing requirements for electronic documentation and communication of patient care in any setting - sign up for access to the SIG collaborative space: collabnet(at)ihtsdo.org
acasey - 09/16/2011 2:25 AM PDT
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Nursing SIG Membership

- Anyone interested in Nursing's need for terminology
- No fees
- Monthly phone calls and collaborative space
- Annual SNOMED CT Implementation Showcase and Working Group Meeting

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Nursing SIG

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Documents > Root Folder > Group Meetings > 2013 > 2013 21 May > **List Documents**

Documents

- Root Folder
  - Group Meetings
    - 2010
    - 2011
    - 2012
    - 2013
      - 2013 19 February
      - 2013 19 March
      - 2013 21 May
      - 2013 18 June
  - Projects
    - Skin Assessment
    - Nursing Occupations
    - Problem List Subset
    - Order Sets
    - Representing Nursing in SNOMED CT
    - C-HOBIC map
    - ICNP map
    - Regimes and therapies
    - Review of Nursing Terminologies
    - Observables and assessments

2013 21 May (4 Items)

Document ID : Document Name
doc8290: Actions from March meeting
doc8283: May NurSIG Agenda
doc8298: Nursing SIG May minutes
doc8299: NurSIG Action Items May 2013

Nursing Problem List Subset of SNOMED CT

Nursing Problem List Subset File	Derived from SNOMED CT International Release version	Derived from UMLS Metathesaurus version	Number of Concepts
NursingProblemListSubset_201206.zip	January 2012	2012AA	417
NursingProblemListSubset_20110408.zip	July 2010	2010AB	368

Introduction
The SNOMED CT® encoded Nursing Problem List Subset, intended for use in patients' problem lists, is an output of the Unified Medical Language System® (UMLS®) Metathesaurus® that is based on nursing diagnosis concepts found within the Metathesaurus.

Purpose and use of subset
The main purpose of the Nursing Problem List Subset of SNOMED CT is to facilitate the use of SNOMED CT as the primary coding terminology for nursing problems used in care planning, problem lists or other summary level clinical documentation.

The use of a common list of SNOMED CT concepts will maximize data interoperability among institutions. Local problem list vocabularies often need to expand to satisfy specific user needs. Institutions that are using their own nursing problem list vocabularies are encouraged to map them to SNOMED CT with a focus on these nursing diagnosis concepts to facilitate data interoperability. The UMLS Terminology Services (UTS) includes a SNOMED CT browser that may be used for this purpose. The SNOMED CT Browser is available through the *SNOMED CT* menu of the UTS.

Choice of SNOMED CT concepts
To find the most appropriate SNOMED CT concepts for each problem list term, the following guidelines are used:

- Only current SNOMED CT concepts are included (concept status = 0).
- Concepts belonging to the Non-Human Subset are excluded.
- Most concepts are chosen from the SNOMED CT clinical finding hierarchy.

www.nlm.nih.gov/research/umls/Snomed/nursing_problemlist_subset.html

The 'Language Police' perspective

Everyone must say it the same way

Do not use vague terms like 'fundus'

Do not use terms that are misleading like 'pyogenic granuloma'

Leg is leg as in the anatomy books

SNOMED Clinical Terms is <u>not</u> the Language Police

SNOMED CT tries to capture what people mean – rather than tell them what terms they must use to express a particular meaning

Questions?