



SNOMED CT Basics for Clinical Staff

Awareness Training and Assessment

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Introducing SNOMED to Clinical Staff



Learning Objectives:

- Foundational knowledge of the structure and use of SNOMED for clinicians
- Ability to search, find and retrieve SNOMED CT terms using an internet browser
- Discernment of the difference between terminologies and classifications used in healthcare settings
- Understanding of the role of SNOMED CT integration into electronic health records systems
- Basic development principles and best practices in administering knowledge assessments involving SNOMED CT

Introducing SNOMED to Clinical Staff

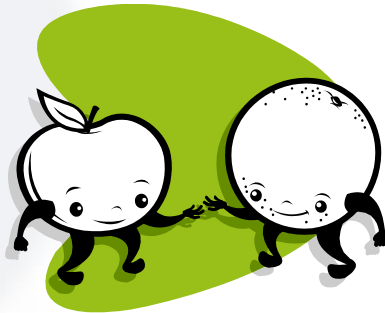


- Interest in the clinical use of SNOMED CT is increasing around the world
- The need for education and training in **the clinical uses of SNOMED CT is growing**
- As more countries adopt its use, the need for knowledge transfer and clinician training is urgent

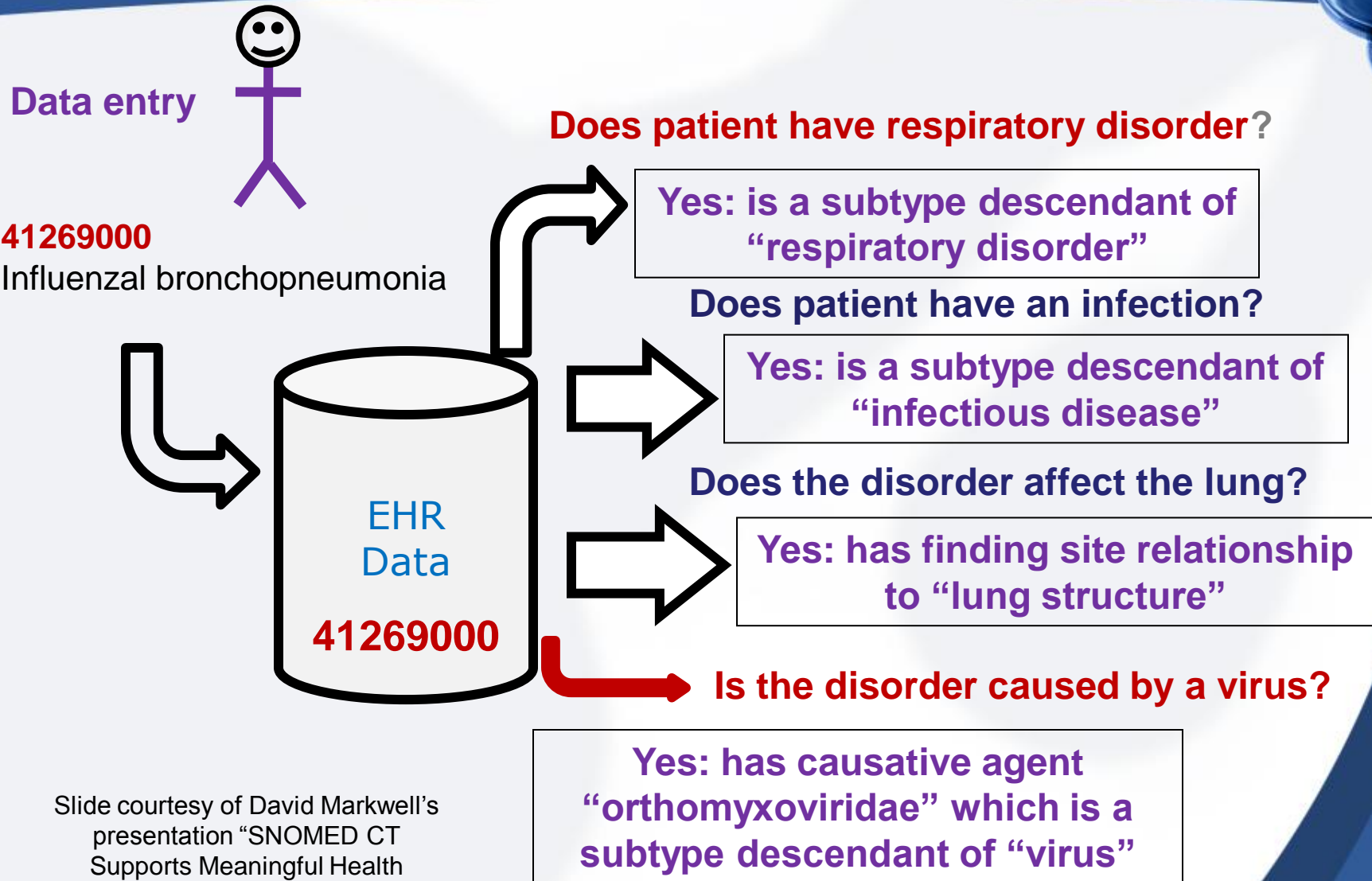


Introducing SNOMED to Clinical Staff

- Depending on the clinician's role the use of classifications have been used for many years for encoding information
- SNOMED CT is a **clinical terminology**
- It is important to recognize that classification systems and terminologies are **designed for different purposes**



SNOMED CT Supports Meaningful Health Records



Slide courtesy of David Markwell's presentation "SNOMED CT Supports Meaningful Health Records" HIMSS AsiaPac13 2013

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- A classification systematically arranges things in **groups or categories** according to established criteria
- A terminology provides **terms for use** in a particular business or field of study
- SNOMED CT and classifications such as the *International Statistical Classification of Diseases and Related Health Problems (ICD-10)* **support different aspects of medicine** and health care documentation requirements

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- A **common medical language** provides significant benefits by enabling semantic interoperability
- Terminologies and classifications are designed for different purposes and **both are used to satisfy important and diverse user data requirements**
- Getting the most out of electronic health records requires both!



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- It is possible for SNOMED CT to enable data capture at the **point of care**
- The terminology plays a pivotal role in electronic health records due to its broad coverage of clinical representation
- Using SNOMED CT to represent clinical information enables **retrieval** and reporting from EHRs



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- When the terminology **is implemented in software applications** it can be used to represent clinically relevant information in the process of producing electronic health records



- Browser tools are increasingly available and easy to use



Basic SNOMED CT Knowledge



- Like many other forms of technology use there are **tools for access** and specific functions
- One browser is a mobile application which runs on a Smart Phone and/or I-Pad
- A listing of [SNOMED CT browsers](#) is available from the US Library of Medicine

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- Browser examples
 - [CliniClue Xplore](#) is easy to use
 - [Snomobile](#) is designed for I-Pad and Smart phones
 - [National Library of Medicine SNOMED CT Browser](#)
 - [Snoflake](#)
- There are many browsers available these are only a sampling of products

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- The current IHTDSO project developing a **one-way authoritative map** from SNOMED CT to ICD-10 (and eventually other WHO-FIC classifications) enables data capture at the point of service
- Efficiency is improved by leveraging technology to **link the clinical terminology representation to the classification** for secondary use

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- Care must be taken to assure **data integrity** when linking systems
- Opportunities for capturing data once and reusing it for a different purpose leveraging maps from SNOMED CT are increasing
- Example: [Development of the I-Magic Mapper by the National Library of Medicine for Problem Lists](#)

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- SNOMED CT can help in the ICD transition to **new versions**
- Clinician's frequently note that ICD terms are not user friendly while the language of SNOMED CT is more **clinician** friendly
- Direct use by healthcare providers **during the process of care** is possible through technology support

Introducing SNOMED to Clinical Staff

- The **structure** of SNOMED CT standardizes detailed **clinical information** for documentation in health records
- This structure also **ensures interoperability** across software applications involving disease reporting
- Information **retrieval** is improved



Introducing SNOMED to Clinical Staff

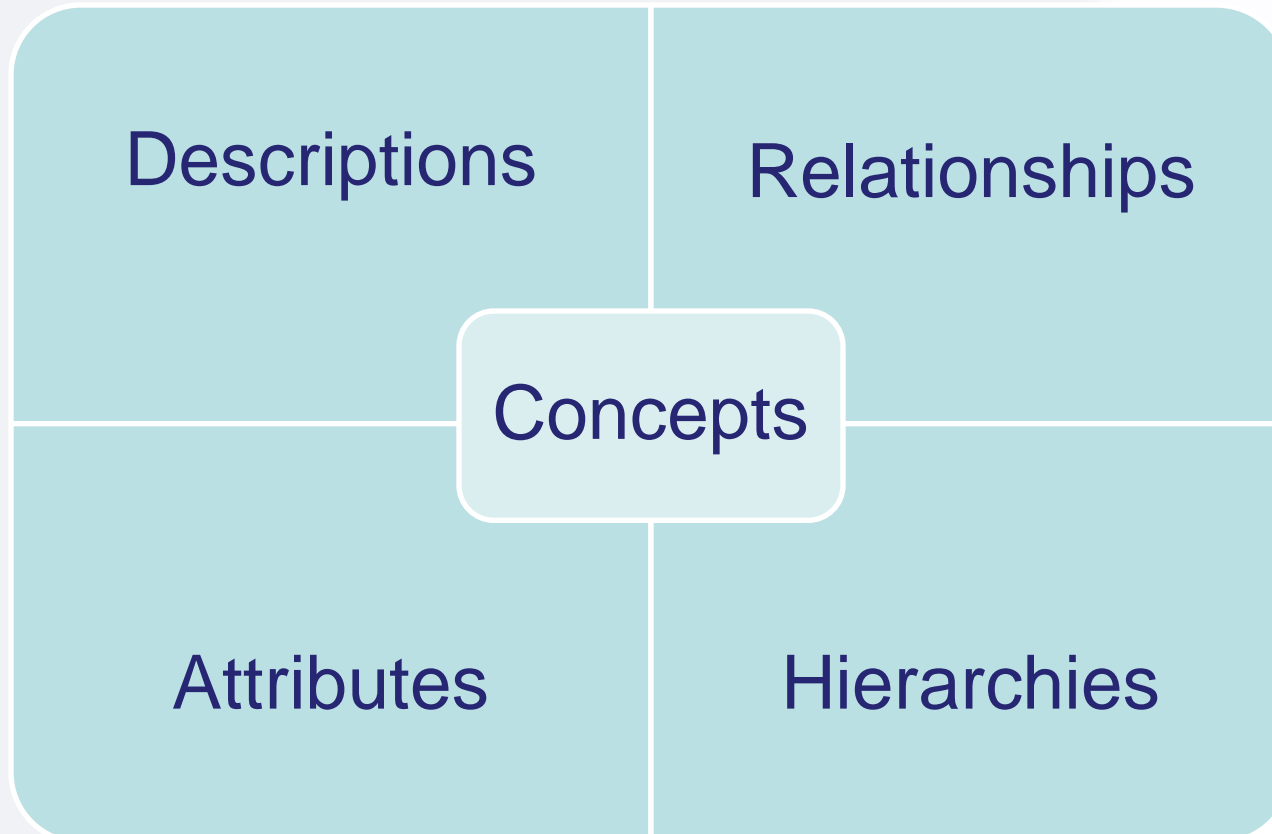


- The best approach for introduction and awareness is to communicate the **benefits** of implementing SNOMED CT in clinical systems
- IHTSDO provides [benefit lists](#) and [information sheets](#) in web friendly documentation and in **monthly newsletters**
- Check the resource list for links for IHSTDO authoritative resources

Basic SNOMED CT Knowledge



- Basic Components include:



Basic SNOMED CT Knowledge

- Building blocks
 - **Concepts** provide the anchors for meaning
 - **Descriptions** are strings of readable characters used to express meaning of the concepts
 - **Relationships** provide concept to concept links to express information in computer processable language

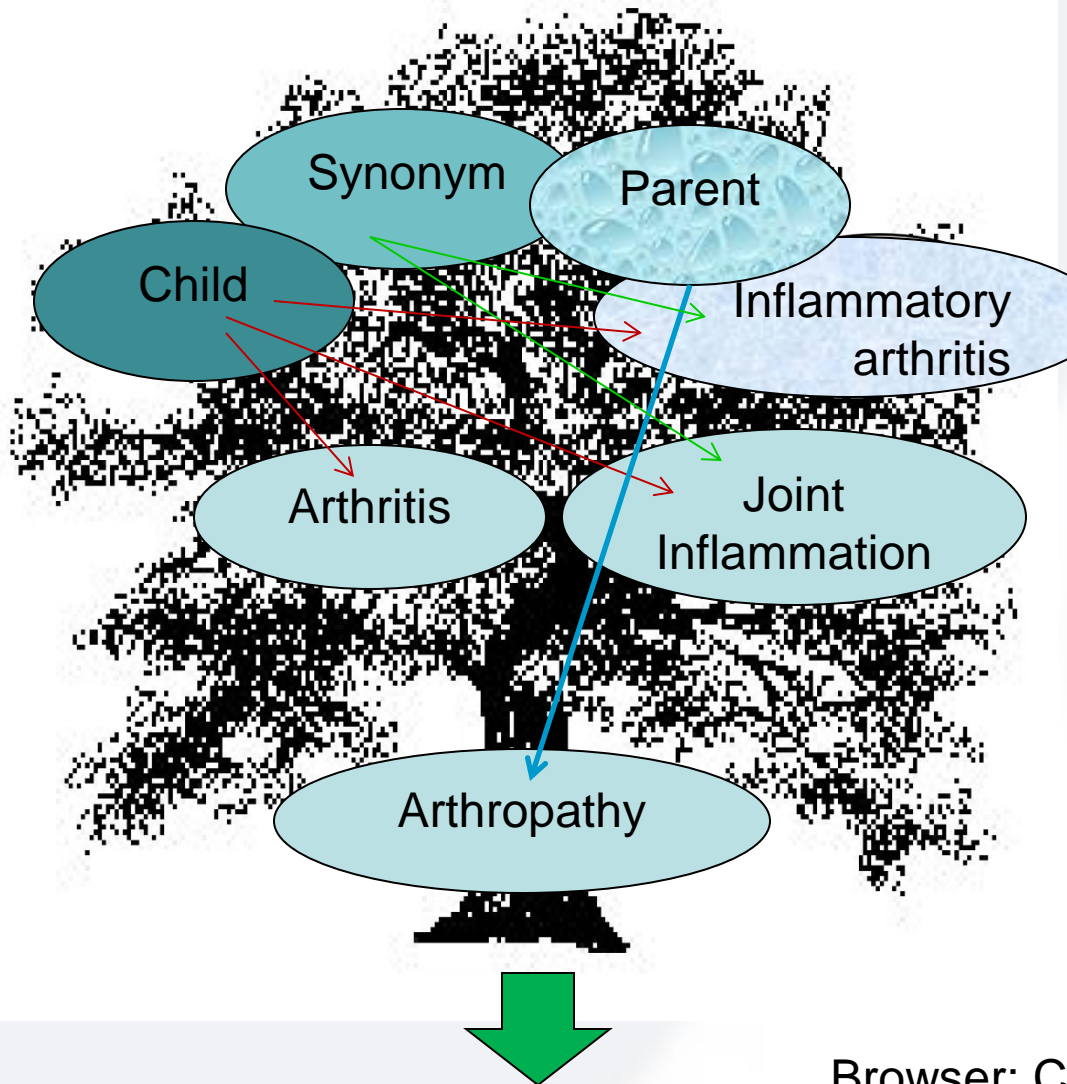


Basic SNOMED CT Knowledge



- Building blocks
 - **Attributes** are properties or characteristics of concepts
 - **Hierarchies** are comprised of parent-child relationships which means there are broad concepts at the top (called the parent) followed by child concepts which are more specialized or specific than the parent concept
 - This structure is **almost** like a genealogy diagram for relatives

Basic SNOMED CT Knowledge

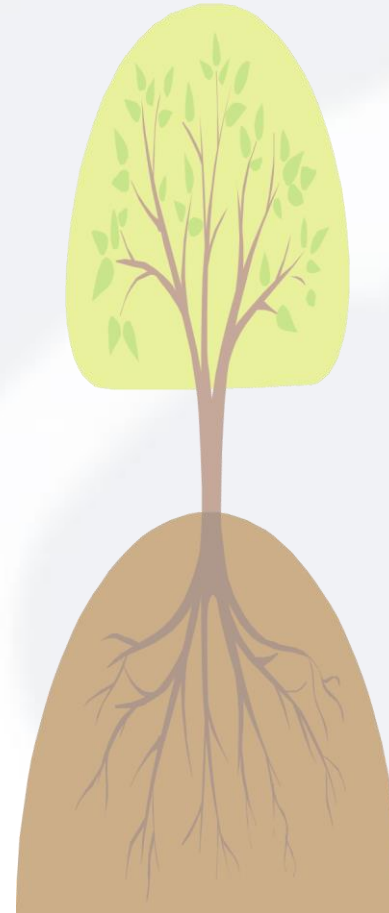


Concept Status: current

- Descriptions
 - Lang: en-US
 - Arthritis (disorder)
 - Arthritis
 - joint inflammation
 - inflammatory arthritis
- Definition: Fully Defined as ...
 - is a
 - inflamed joint
 - is a
 - inflammation of specific body organs
 - is a
 - inflammatory disorder of musculoskeletal system
 - is a
 - arthropathy
 - Group
 - associated morphology
 - inflammation
 - finding site
 - joint structure
- Qualifiers
 - severity
 - severities
 - episodicity
 - episodicities
 - clinical course
 - courses

Basic SNOMED CT Knowledge

- Root Concepts
 - Clinical finding
 - Inflammatory disorder
 - Arthritis
 - » Rheumatoid Arthritis
- Selection of Concepts
 - SNOMED CT Browsers
 - Drop down lists
 - Automated mapping
 - Use of value sets



Basic SNOMED CT Knowledge

- SNOMED CT **Logical Model**
 - Component Design uses
 - Concepts
 - Descriptions
 - Relationships
 - Derivatives use
 - Navigation hierarchies
 - Reference sets
 - **Cross Maps**



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- Description logic from a knowledge representation viewpoint:
 - A set of constructs for representing terminological knowledge
 - Algorithms and their implementations for performing
 - **Subsumption** (Testing pairs of expressions to see whether one is a subtype of the other & vice versa)
 - **Classification** (Structuring in a set of expressions according to their subsumption relationships)

Basic SNOMED CT Knowledge



- The core components included in the model specify a structured representation of:
 - Clinical ideas
 - Terms to represent these ideas
 - Relationships between these ideas when it exists
- Every concept represents a **unique** clinical idea

Basic SNOMED CT Knowledge



- **Technical information** is available for clinicians seeking how the terminology works
- Clinicians do not need to **master how the terminology is developed and maintained** to reap the benefits of its use
- Follow the links in the resource pages to learn more about SNOMED CT use in electronic health records and more

Assessment of Knowledge



- Implementation and use of SNOMED CT requires **orientation and training** for best success
- **Fact:** Clinical professionals have limited time to spend in a classroom
- Training programs are most successful when **assessment of knowledge** is included in the program

Assessment of Knowledge

- Adult learning principles suggest that adult learners have these **characteristics**:
 - Internally motivated and self-directed
 - Bring life experiences and knowledge to learning experience
 - Goal oriented
 - Relevancy oriented
 - Practical
 - Seek respect



Assessment of Knowledge



- Typical assessment of knowledge for healthcare settings:
 - **Overview** sessions in person, by webinar or through distance education sessions
 - Administration of a **pre-training assessment** is given to measure current knowledge of the topic
 - After training sessions have been completed a **post-training assessment** is administered to measure results of the learning experience

Assessment of Knowledge



- Busy clinicians generally prefer online and **self-scoring** assessments
- Provision of “real life” **case studies** are most effective in learning about new technology affecting clinical practice
- Since adult learners are relevancy oriented it is critical to feature assessments and materials which are **relevant to roles or specialty of practice**

Assessment of Knowledge



- Practical assessments are important for clinical staff– it is best to start with simple easy to understand features of SNOMED CT based on a use case **already familiar** to clinicians
- Include opportunities within the assessments to include **clinician experiences** when developing or selecting assessment tools

Developing Educational Resources



- When creating knowledge assessments first **determine the skill and/or competencies you want to test**. This assures the effort spent on taking the assessment is useful and applicable to the person being tested
- IHTSDO is currently developing an inventory of **publically available** and accessible SNOMED CT training resources

Developing Educational Resources

- **Common barriers for adult learners include**
 - Lack of time, scheduling problems
 - Lack of confidence in test taking
 - Unable to see the importance of adopting or using SNOMED CT
 - Respond only to visual learning and “hands on” learning with a guide



Developing Educational Resources



- Common solutions for breaking down barriers
 - Create **short but challenging** assessments and provide incentives to participate in the learning exercise
 - Offer **online “any time” assessments** with the ability for the test taker to review questions not answered correctly and supplemented with authoritative references for additional learning value

Developing Educational Resources



- Writing questions for SNOMED CT assessments can be challenging
- Items should be focused on a **specific knowledge point, skill or ability**
- Test specifications are used to inform a testing blueprint to guide the question development
- Item writers for assessments **must have substantial knowledge** of SNOMED CT

Developing Educational Resources



- For **measurable success** it is important to be able to differentiate between assessment takers with **high to low levels of knowledge about the terminology** after training sessions or educational services have been administered
- Each question asked in assessments **must relate** to the intended piece of knowledge
- Avoid superfluous information



Developing Educational Resources



- **Terminology for test development**
 - Item
 - Stem
 - Prompt/Stimulus
 - Options
 - Key
 - Distractors/Confounders
 - Response
 - Rubric

How To Create a Test Blueprint



- For professional employment related assessments it is **essential to distinguish the level of aptitude**, abilities and knowledge requirements
- Start with **fundamental knowledge clusters** provided within IHTSDO documentation and resources
- Select the **skills and abilities** important to evaluate

How To Create a Test Blueprint



- Record the objectives of developing the test
 - **Identify** the type or class/audience of users of SNOMED CT to be assessed
 - Determine the **number and types of questions** to include
 - Decide on the **delivery** method
 - Determine if a Pre-test assessment will be offered **before** training is provided

How To Create a Test Blueprint

- Record the **objectives** of the project and plan before developing the test
 - State your goal of providing SNOMED CT related assessments for clinical staff
 - Determine the **time and availability** for assessments to be administered
 - Decide on the **delivery** methods
 - Online
 - In classroom
 - Paper



How To Create a Test Blueprint

- Develop an outline of SNOMED CT **topics and knowledge** important to achieve training goals
- Plan and arrange for **qualified personnel** for item writing
- Develop a plan for **scoring** test items
- Determine the method of sharing assessment **results**



Tips for Assessment Delivery



- Explore use of **online assessment vendors** – some are free or low cost
- Leverage educational support services from your institution
- Consider engaging **education and training companies** and who are familiar with SNOMED CT
- Engage interested clinicians to **assist** with training

Tips for Assessment Delivery



- Get familiar with the resources and **documentation available** through the IHTSDO
- Leverage the monthly newsletters from IHTSDO for information and as a source for **testing items** (questions)
- Make learning fun by using gaming, online surveys and creative challenges related to SNOMED CT

Resource List

- IHTSDO General Information including
 - Benefits of SNOMED CT
 - SNOMED CT Value Proposition
 - <http://www.ihtsdo.org/snomed-ct/>
- SNOMED CT Concept Identifier Lookup Service
 - <http://www.ihtsdo.org/snomed-ct/snomed-ct-lookup-service/>

Resource List



- SNOMED CT Documentation July 2013
 - http://ihtsdo.org/fileadmin/user_upload/doc
- Includes
 - Frequently Asked Questions – SNOMED CT User Guide
 - SNOMED CT Editorial Guide - SNOMED CT Technical Implementation Guide
 - Draft IHTSDO Glossary - SNOMED CT Release Format 1
 - SNOMED CT Release Notes – SNOMED CT Scope Memo
 - SNOMED CT Non-Human Refset Guide – SNOMED CT Mapping Specification
 - SNOMED Medical Devices – SNOMED CT Developer Tool Kit Guide
 - SNOMED CT Release Format 2 Value Proposition – SNOMED
 - CT Canonical Table (RF1)

Resource List



- Presentations from the 2012 IHTSDO Implementation Showcase
 - http://www.ihtsdo.org/fileadmin/user_upload/doc/showcase/
- History of SNOMED CT
 - <http://www.ihtsdo.org/snomed-ct/history0/>
- Licensing
 - <http://www.ihtsdo.org/licensing/>

Resource List



- An Overview of Adult Learning Processes
(Sally S. Russell, MN, CMSRN, CPP)
 - http://www.medscape.com/viewarticle/547417_2
- Adult Learning Theory and Principles: The Clinical Educator's Resource Kit (Queensland AU Occupational Therapy Fieldwork Collaborative)
 - <http://www.qotfc.edu.au/resource/?page=65375>

Resource List



- Example of development of a test blueprint from the Schreyer Institute for Teaching Excellence (Penn State University)
 - <http://www.schreyerinstitute.psu.edu/pdf/TestBlueprint.pdf>
- Sample test blueprint from the Pediatric Hematology & Oncology Certification Review
 - <http://pedhemoncreview.wikidot.com/test-blueprint>
- Item Writing and Review Guide from the Assessment Systems Corporation
 - http://www.assess.com/docs/ASC_Item_Writing.pdf

Resource List

- Clinical Classification and Terminology: Some History and Current Observations (Christopher G. Chute, MD, DrPH)
 - <http://jamia.bmj.com/content/7/3/298.full>
- SNOMED CT: Who Needs to Know What? (Ed Conley, Tim Benson)
 - http://www.ejbi.org/img/ejbi/2011/2/Conley_en.pdf
- Sharing Ontology between ICD-11 and SNOMED CT will enable Seamless Re-use and Semantic Interoperability (Nine authors)
 - <http://ebooks.iospress.nl/publication/34015>

Questions ?



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IHTSDO Activities

Quality Assurance Standing Committee
SNOMED CT Implementation Advisory Scheme
Education Special Interest Group