



Guidance on the Preparation of Terminology/Classification Mapping Personnel

SNOMED CT to ICD-10

Role, competencies, and curriculum content

Date 20090601

Version 1.00

Amendment History

Version	Date	Editor	Comments
0.01	20081209	Rita Scichilone	Content placed into IHTSDO document template
0.02	20081224	Kathy Giannangelo	Incorporation of feedback from education special interest group; addition of introductory text, definitions, and material based on education SIG feedback; re-organization according to curriculum development framework
0.03	20090106	Kathy Giannangelo	Added job descriptions and course syllabus
0.04	20090109	Kathy Giannangelo	Incorporation of feedback from mapping education subgroup including overall guidance perspective is for mapping personnel not just mappers, definitions for semantic and lexical matching, and additions to Annex B and Resources.
0.05	20090123	Rita Scichilone	Following group discussion. Incorporation of comments and suggestions from MapSig Chair and work group. Separation of duplicate content in section 6.5 (core curriculum to Annex B with addition of Annex C for Example Syllabus to make the document more concise and separate curriculum from course planning. Throughout the document and job descriptions strengthening the essential competency and requirements of map development personnel from desirable to essential or required.
0.06	20090202	Kathy Giannangelo	Incorporation of feedback from mapping SIG
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Review Timetable

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20110401	Mapping SIG	SNOMED CT to ICD10 work will provide feedback
		(remove or add rows if necessary)

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1 Background

1.1 Appropriately skilled mapping personnel are needed to ensure the quality and integrity of a map from a source terminology to a target terminology. To date, most people working with terminology maps do so by receiving education through informal tutorials, seminars, and on the job training. There is no standard for what should be included in educational offerings and no competency requirements to ensure those involved in developing maps are appropriately skilled.

1.2 There are many target and source terminologies from which to choose when creating a map. In addition, there are a number of personnel involved in the development of a map. The focus of this document is to recommend what the role should be for SNOMED CT to ICD-10 mapping personnel and their expected competencies. A curriculum outline is included for use as a requirements specification when evaluating a course of study and as a guide for education providers when preparing course content.

1.3 The source of health information professionals involved in mapping will come from a wide variety of backgrounds including clinical coding and/or health information management. There is currently no formal certification process for SNOMED CT subject matter expertise. In some countries there are processes in place to certify ICD-10 subject matter expertise. Knowledge of the mapping principles between SNOMED CT and ICD-10 will be gained from experienced mapping leaders currently involved in SNOMED CT and ICD-10 mapping efforts.

1.4 There are three parts to the SNOMED CT to ICD-10 Mapping Education Program for mapping personnel: role requirements, expected competencies, and the curriculum outline. Annexes provide examples of position descriptions, course syllabus, and core curriculum.

1.5 Reference documents used in conjunction with this guidance:

- Mapping SNOMED CT to ICD-10: A Collaborative Project in Healthcare Information Interoperability with the World Health Organization
- SNOMED ICD-10 Map Data Structures

2 Purpose and scope

2.1 The overall purpose of the SNOMED CT to ICD-10 Mapping Education Program for mapping personnel is to support IHTSDO members and other organizations in recruiting, educating, certifying, and managing SNOMED CT to ICD-10 mapping personnel to ensure the quality and integrity of the map.

2.2 Role definitions and competency requirements of SNOMED CT to ICD-10 mapping personnel described herein will assist IHTSDO members with the management of their workforce. Specific position descriptions may vary by organization depending on one's business needs. [Annex A](#) provides examples derived from actual position descriptions for mapping personnel. [Annex B](#) provides a core curriculum that forms the educational foundation for SNOMED CT to ICD-10 map development. [Annex C](#) provides an example of a course syllabus illustrating the scope of the training effort required.

2.3 The curriculum outline is provided as a requirement specification for use when evaluating a course of study. It also serves as a guide for education providers when preparing course content. IHTSDO is not defining a single, standard syllabus. The education providers determine how the content will be delivered, such as a mix of web based sessions with condensed supervised practice. Annex B provides an example of course syllabus illustrating the scope of the training effort required. Annex C provides a listing of the core curriculum that forms the education foundations for SNOMED CT to ICD-10 mapping personnel.

2.4 Even though the scope of this guidance is focused on SNOMED CT to ICD-10 mapping personnel, core tasks (excluding expertise in tool deployment), will be required knowledge and skills of map leaders, consensus managers and developers of maps between SNOMED CT and other systems.

2.5 Educational resources such as course materials and e-learning packages are not included in the guidance. It is up to the education providers to develop or utilize existing resources which meet the SNOMED CT to ICD-10 Mapping Education Program learning objectives stated herein.

Out of scope

A Mapping Education Program for mapping personnel of terminologies and classifications other than from SNOMED CT to ICD-10 is out of scope of this document. The official WHO version 2 of ICD-10 including errata as of 2008 is the standard for this mapping. All national specializations and other adaptations of ICD-10 are out of scope of this document.

3 Definitions

Competency

A person's ability to undertake a role or perform a task including related dimensions of ability such as underpinning knowledge

Curriculum

The topics that must be covered in an educational training program along with recommended teaching, learning and assessment strategies with a goal of developing competency by the student

ICD-10

The International Classification of Diseases and Health Related Problems (The) ICD-10, 2008 Edition. Originally published in the early 1990s, ICD-10 now incorporates all edits and updates since 1996 up to end of 2008.

Mapping Specialist

An individual who is competent to determine whether a SNOMED CT concept within a source terminology has a link to a concept in ICD-10.

Mapping

For this use case mapping is the act of detecting a meaningful relationship between a concept within SNOMED CT to a target code or codes in ICD-10.

Semantic Matching

Semantic matching uses knowledge of meaning of the SNOMED CT concept and target ICD-10 code(s) to develop the map. For example, semantic matching may use knowledge of synonyms, knowledge of part or whole relationships, knowledge of class/subclass (parent/child, sub-type/super-type) relationships, and knowledge of the user's own information and realm of context to increase both recall and precision of matching choices.

SNOMED CT®

SNOMED CT (**S**ystematized **N**omenclature of **M**edicine-**C**linical **T**erms) is considered to be the most comprehensive, multilingual clinical healthcare terminology in the world. SNOMED CT intellectual property rights were transferred to the SNOMED SDO® in the formal creation of the IHTSDO.

Lexical Matching

Lexical matching occurs when the source term matches the target term exactly; word for word, singular to singular, plural to plural, etc.

Syllabus

The translation of a curriculum into a specific course of study

4 Core activities of the SNOMED CT to ICD-10 Map Development

4.1 To support the development of a SNOMED CT to ICD-10 map, the mapping specialist:

4.1.2 Creates maps using a standardized, scientifically validated and consistently applied mapping methodology using mapping tools

4.1.3 Practices within a standardized operational framework to develop process reliability and enhance competency.

4.1.4 Provides support to map users

4.2 The role of the SNOMED CT to ICD-10 mapping specialists, map leads and will also involve supporting activities such as: contributing to the development of mapping heuristics, consensus management, participation in peer review, and education of map users.

4.3 The SNOMED CT to ICD-10 personnel will use reference documents for the map development project used for project specific training, as appropriate.

5 Competencies

5.1 All candidate SNOMED CT to ICD-10 mapping personnel must have a broad knowledge of clinical terminology and medical science principles. This is qualified by training in line with existing standards developed by the Joint Collaboration between WHO-FIC and International Federation of Health Records Organizations (IFHRO) and/or a record of previous professional background or experience with clinical terms. Personal computing skills (word processing, database) and familiarity with Internet access, navigation and basic tools is required.

Problem solving, communication, and decision making skills are also part of a SNOMED CT to ICD-10 mapping personnel competency base. Knowledge of both SNOMED CT and ICD-10 is necessary to be able to create or validate maps between the code sets with the required level of accuracy required.

5.2 The following competencies underpin the core activities and are grouped into domains. At the completion of the SNOMED CT to ICD-10 Mapping Education Program, personnel apply and demonstrate understanding of the following:

5.2.1. ICD-10 knowledge/skills of the classification rules and conventions

The capacity to:

- Describe the purposes of ICD-10
- Explain Classification system uses and users, and the benefits of using the classification
- Describe the structure of ICD-10

- Apply the morbidity principles of disease coding using ICD-10
- Interpret and utilize ICD-10 standards and conventions
- Understand the processes for updating and modifying ICD-10

5.2.2 SNOMED CT concept model knowledge/skills

The capacity to:

- Describe what SNOMED CT is, what it is for and how it is implemented and used
- Describe the structure of SNOMED CT
- Describe the SNOMED CT concept model
- Explain the composition of SNOMED CT and how its different parts are related with special attention to Clinical findings, Events and Situations
- Understand the processes for updating and modifying SNOMED CT
- Utilize a SNOMED CT browser and search tools
- Assess and evaluate SNOMED CT concept semantics

5.2.3 Theoretical aspects of mapping

The capacity to:

- Describe the differences in purpose and structure between SNOMED CT and ICD-10
- Describe why maps are created between clinical terminology and classification systems
- Identify the different types of maps such as rule-based, context free, forward and reverse
- Describe the purpose, scope and use cases for mapping SNOMED CT to ICD-10

5.2.4 Mapping process

The capacity to:

- Evaluate the SNOMED CT concept for clarity and definition as specified in the Map Technical documentation for the project
- Apply principles of mapping between systems using the defined mapping methodology
- Apply mapping procedures for concepts
- Recognize the differences between a semantic, knowledge-based map and a lexical approach
- Apply the technical structure for rule based mapping of ICD-10
- Apply the advice in the IHTSDO map toolkit and/or workbench
- Identify ambiguous SNOMED CT concepts or ICD-10 code and/or discordant SNOMED CT matches, review and resolve or escalate the issues according to procedure

5.2.5 Consensus Management

In order to enhance reproducibility and utility of the map, personnel must work within and contribute to a framework of consensus development and management:

- Analyze discrepancies in map target assignment between mapping personnel, document assumptions and reference standards pertaining to the map assignment, and collaborate to create a shared agreement on map targets within an open dialogue
- With supervision and collaboration of the map leads, document assumptions and reference standards guiding map activity in the map technical documentation
- Understand and participate in consensus management activities as specified in the map technical documentation and sample job descriptions.

5.2.6 Quality assurance (QA)

In the context of a mapping environment that conforms to IHTSDO quality standards (for example, use of dual independent review and access to map lead support), competent SNOMED CT map development personnel have the capacity to:

- Identify and apply quality assurance principles and processes that support the mapping process
- Use browsers and mapping tools to create, modify, retire and review maps
- Apply the SNOMED CT concept model and ICD-10 classification system consistently in the mapping process
- Identify and resolve basic QA issues
- Recognize and refer mapping issues that are beyond his/her competence
- Prepare / review and manage new map requests
- Participate in or provide guidance for testing of maps for specific purposes

6 Curriculum Requirements and Mapping Personnel Preparation

Candidate SNOMED CT to ICD-10 mapping personnel who are able to demonstrate achievement of the core competencies with previous certification and experience in SNOMED CT and/or ICD-10 are exempt from stages 1 and/or 2 of the education program. (See Annex B).

Acceptable proof of meeting these requirements include:

- Documented professional background in the areas of terminology application.
- Evidence showing all core competencies in 1 and/or 2 of the curriculum has been met.

All candidate SNOMED CT to ICD-10 personnel (map specialists, map leads, and consensus manager) must complete stage 3 of the education program.

6.1 The SNOMED CT to ICD-10 Mapping Education Program shall include course material which enables students to demonstrate knowledge and skills appropriate for the activity of mapping between SNOMED CT and ICD-10.

6.2 In addition, SNOMED CT and ICD-10 knowledge appropriate for all mapping personnel shall be incorporated in the education program.

6.3 The final requirement is knowledge of the mapping principles between SNOMED CT and ICD-10.

6.4 Teaching, learning and assessment

6.4.1 A blend of independent study, didactic instruction, and hands on mapping is required to develop the competencies of the SNOMED CT to ICD-10 map development personnel. Personnel should be trained using the same mapping tools as those used in a test database. Access to a training development environment appropriate for hands-on mapping exercises and assignments should be provided. This is also an important requirement to consider when commissioning or upgrading tools. Local supervision / mentoring by experienced map development personnel are essential to support experiential learning and manage assessments.

6.4.2 The following reference materials are essential for any SNOMED CT/ICD 10 mapping course:

- SNOMED CT Users Guide
- SNOMED CT Browser or IHTSDO Workbench tools
- ICD-10 reference sources and documentation from the World Health Organization
- Technical Documentation for SNOMED CT to ICD-10 Reference Mapping
- Users Guide and/or the manual for the selected mapping tools used for the project

6.4.3 A combination of assignments to monitor understanding and evaluation exercises to assess achievement of competencies is recommended. The majority of these assessments should be formative for the purpose of identifying areas where further study or additional hands-on exercises are required. Recognition or certification of competence could be through mentor review of performance or objective testing or some combination of the two. Until the new mapper is assessed as competent, his/her work will not be employed in map development projects until it has been reviewed for accuracy.

6.4.4 Ongoing performance review and support for career enhancement with further courses of study should be part of the organization's workforce strategy.

7 Annexes

Annex A: Mapping Personnel Job Descriptions

Three separate roles to ensure optimal quality, utility and reproducibility of the resulting map are:

1. Mapping Specialist
2. Map lead
3. Consensus Manager

Sample Job Description Source: Composite of various organizations including the National E-Health Transition Authority (Australia) and the National Health Service (UK) and the American Health Information Management Association (AHIMA)

Job Title: Mapping Specialist

1. **POSITION PURPOSE:**

The main function of the job is to:

Provide expertise and support for data mapping projects involving the International Health Terminology (SNOMED CT) to other coded data systems including the International Classification of Diseases (ICD) tenth revision. (ICD-10). One or two map specialists may be allocated to one or more map batches (SNOMED CT concepts assigned for mapping).

The primary task for this position is development and review of mappings between terminologies and classifications used in health care information systems. This work is needed to carry out the mission of the IHTSDO to support member countries needs and the healthcare industry by creating, reviewing and maintaining maps that impact clinical terminology use in the electronic health record.

2. **DIMENSIONS:**

Number of staff supervised: None.

This position has no direct budget planning responsibility but is expected to use resources provided with discretion and apply prudent time management to the project. Map development specialists work in a team environment with another mapper, one or more map leads, consensus managers and editorial reviewers.

Required behavior and attitudes include:

- Shares information
- Participative and collaborative
- Team outcome focused
- Reliable
- Follows process instructions
- Listens to others points of view
- Respectfully defends position and explains rationale

3. **PRINCIPAL ACTIVITIES, END RESULTS, AND PERFORMANCE**

Rank of Importance	What Do Mapping Specialists Do? (Major Activities)	Why Is This Function Performed? (Desired End Result)	Ways to Measure Accomplishment of End Results
1.	Provide content subject matter expertise for mapping projects appropriate to the use case. Foundational knowledge of SNOMED CT as the source terminology and experience with ICD-10 is required (e.g. ICD-10 conventions and guidelines are applied to candidate SNOMED CT concepts and a match rating is determined).	To enable data capture in one terminology and link it to classification system for specific use cases. Data maps are used in healthcare information systems to provide semi-automated match to increase efficiency through re-use of data.	High quality, successful maps are developed according to the project plan and timeline.
2.	Review meaning of the SNOMED CT concept and the fully	To support an efficient map creation process by	Efficient, track-able, mappings

	specified name and defining relationships as specified in the SNOMED Users' Guide ¹ . Using mapping system software supplied by the project, match this information with the best candidate in the target terminology using all conventions and guidelines that apply. When necessary add the rationale for the selection.	leveraging technology	with rationale for concept match included.
3.	Employ mapping heuristics for determination of the target code. Include any rationale for the match for each SNOMED CT concept processed.	For quality control and consistent results	Audit process to confirm addition of rationale where warranted
4.	Contribute to mapping project activities by completing assigned batches of SNOMED CT concepts within specified timeline.	To stay on track to meet established delivery dates.	Comparison of completion of tasks with established deadlines.
5.	Refer any ambiguous map related issues to the map technical lead for review	For quality control and consistent results	Consensus management process success.

4. **PRINCIPAL CHALLENGES:**

Describe the most typical and the most complex problems that are faced in this position, as well as the long-range challenges.

A. **Typical Problems:** Unable to locate a SNOMED CT concept to inform the map and confirm the correct target code using the IHTSDO Workbench.

B. **Most Complex Problems:** Ambiguous terms are difficult to match with a target code or there is more than one selection in the target terminology making it difficult to select the best match. Also some classification systems require more than one code to represent a single concept in SNOMED CT and this can be tricky to accomplish. Maps require the mapping specialist to avoid any assumption of context that is not specifically permitted by the mapping heuristics for the use case in question.

¹ Available from

http://www.ihtsdo.org/fileadmin/user_upload/Docs_01/SNOMED_CT_Publications/SNOMED_CT_User_Guide_20080731.pdf

C. **Long-Range Challenges:** Meeting productivity, consistency and accuracy targets. Specialists also address updates and revisions to SNOMED CT and ICD-10 affecting the process.

5. **AUTHORITY AND RESPONSIBILITY:**

A. What typical decisions do mapping specialists have total authority for making?

- Decide on the most appropriate target ICD-10 code for a SNOMED CT concept
- Flag ambiguity or errors in the terminology or the classification affecting the map

B. What typical decisions are referred to others for approval?

- Final selection of target code for areas of ambiguity
- Mapping specialists also work with the map leads or the consensus management team on request for review of a certain map assignment where concordance has not been achieved with the other mapping specialist.

6. **REQUIRED KNOWLEDGE AND EXPERIENCE:**

Possess diversified coding and data management experience with clinical terminology and/or controlled vocabulary use in at least one general healthcare setting and the ability to rely on past experience, knowledge and networking to meet position demands. Knowledge of global standards, ICD-10 across healthcare settings and related coding experience is optimal. Working knowledge of the use of SNOMED CT and ICD-10 is required through experience and/or formal education.

Role and Competencies for the SNOMED CT to ICD-10 Mapping project

Knowledge of health informatics standards with awareness or exposure to terminology development and/or maintenance. Ability to rapidly acquire knowledge and skill in information retrieval for map development and use of map development tools.

Role Specifics:

- Broad knowledge of medical terminology and medical science principles exemplified by provision of certification of competency in line with existing standards developed by the WHO-FIC-IFHRO Joint Collaboration and/or a record of previous professional background or experience with clinical terms.
- Computer skills and familiarity with Internet access, navigation and basic software tools are required.

Competencies for the SNOMED CT to ICD-10 Mapping project:

1. ICD-10 task requirements

1. Identify classification purpose
2. Explain ICD Classification system uses and users, and the benefits of using the classification
3. Apply the general morbidity principles of disease coding using ICD-10
4. Differentiate morbidity from mortality coding principles and guidelines
5. Describe the structure of ICD-10
6. Describe the uses of ICD-10 (and its clinical modifications)
7. Interpret and utilize ICD-10 standards and conventions
8. Understand the processes for updating and modifying ICD-10

2. SNOMED concept model task requirements

1. Identify the basic definitions and structure of the SNOMED CT concept model
2. Describe the differences between SNOMED CT and classification systems
3. Recognize the components of SNOMED CT and relationships between concepts with special attention to Clinical Findings, Events and Situations with explicit context
4. Assess and evaluate the SNOMED CT concept semantics
5. Utilize a SNOMED CT Browser and/or the IHTSDO workbench and search tools
6. Evaluate the SNOMED concept for clarity and definition as specified in the technical documentation for the map project.

7. Understand the processes for updating and modifying SNOMED CT

Job Title: Map Lead

1. **POSITION PURPOSE:**

The main function of the job is to:

Provide expertise and support for data mapping projects involving the International Health Terminology (SNOMED CT) to other coded data systems including the International Classification of Diseases (ICD) tenth revision. (ICD-10) by supervising the technical aspects of map development and working closely with the consensus management team to identify map records requiring reconciliation or further review of mapping specialist discordance .

The map lead(s) assemble teams of two or more mapping specialists and assess candidates for the mapping specialist positions for the project in compliance with the education plan outlined in Annex B. Map leads support mapping specialists during map development by allocating batches of concepts for mapping and supervising the process. Map leads guide map specialists toward resolving discordant records and escalate any unresolved records to the consensus management team. Map leads and mapping specialists are referred to collectively as “mapping project staff”.

2. **DIMENSIONS:**

Number of staff supervised: minimum of two

This position is accountable for the specified budget for the project and applies prudent time management to the project. Map leads work closely with the mapping specialist team the consensus management team and external review consultants.

Required behavior and attitudes include:

- Teaching and coaching ability
- Shares information

- Participative and collaborative
- Team outcome focused
- Reliable
- Good facilitator

3. PRINCIPAL ACTIVITIES, END RESULTS, AND PERFORMANCE

Rank of Importance	What Do Map Leads Do? (Major Activities)	Why Is This Function Performed? (Desired End Result)	Ways to Measure Accomplishment of End Results
1.	Provide content subject matter expertise for mapping specialists as necessary to provide quality results. Application level knowledge of SNOMED CT as the source terminology and experience with the target terminology. Map leader review work samples, process discordance between map specialist matches and make decisions concerning escalation to the consensus management process.	To enable data capture in one terminology and link it to another for specific use cases. Data maps are used in healthcare information systems to provide semi-automated linkage to increase efficiency through re-use of data.	High quality, successful maps are developed according to the project plan and timeline.
2.	Assist others in understanding and using the SNOMED Users' Guide ² . Using mapping system software supplied by the project, supervise and facilitate matching information with the best candidate in the target terminology. Make assignments and monitor progress towards map completion	To support an efficient map creation process by leveraging technology	Efficient, track-able, mappings with rationale for concept match included.
3.	Explain and troubleshoot mapping heuristics for determination of the target code. Help mapping specialists clearly express the rationale for matches when needed.	For quality control and consistent results	Audit process to confirm addition of rationale where warranted
4.	Contribute to mapping team activities by monitoring progress and facilitating consensus management when required toward reconciliation of disagreement between mapping specialists.	To stay on track to meet established delivery dates and ensure a reproducible map.	Comparison of completion of tasks with established deadlines.

² Available from

http://www.ihtsdo.org/fileadmin/user_upload/Docs_01/SNOMED_CT_Publications/SNOMED_CT_User_Guide_20080731.pdf

5.	Refer any difficult or ambiguous map rows to the consensus management process	For quality control and consistent results	Defensible results and a high quality map.
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4. **PRINCIPAL CHALLENGES:**

Describe the most typical and the most complex problems that are faced in this position, as well as the long-range challenges.

A. Typical Problems: When Mapping Specialists are unable to locate an authorized source for a SNOMED CT concept to inform the map and confirm the correct target code assistance is provided to resolve the discordance. Other typical problems relate to scheduling or coordination of work and/or difficulty with use of software tools used for the mapping project.

B. Most Complex Problems: Ambiguous terms are difficult to match with a target code or there is more than one selection in the target terminology making it difficult to select the best match. Also some classification systems require more than one code to represent a single concept in SNOMED CT and this can be tricky to accomplish. Maps between SNOMED CT and ICD-10 require mapping specialists to avoid any assumption of context that is not specifically permitted by the mapping heuristics for the use case in question. Map leads provide additional guidance as needed to avoid context assumptions. When there is no clear action apparent the issues are referred to the consensus management process for additional review and reconciliation

C. Long-Range Challenges: Managing the process in order to meet productivity, consistency and accuracy targets.

5. **AUTHORITY AND RESPONSIBILITY:**

A. What typical decisions do Map Leads have total authority for making?

Map Leads assign and monitor project assignments and priorities for the mapping specialist teams. They also schedule and support consensus management team towards reconciliation of discordant matches within the

map. This position must use leadership skills and be motivated to plan tasks to achieve operating objectives. Map leads provide continuous education and coaching of map specialists to produce optimal results.

B. What typical decisions do map leads refer to others for approval?

Map records with clinical ambiguity affecting a clear match must be referred to the consensus team for review. Significant changes from the project plan or timeline require notification and approval. Map leads arrange for and troubleshoot tool updates. Any request involving use of funds from the project budget that are not designated in the work plan must be approved by the project manager.

6. **REQUIRED KNOWLEDGE AND EXPERIENCE:**

Possess diversified clinical coding supervisory and data management experience with clinical terminology and/or controlled vocabulary use in at least one healthcare setting. Map leads must have the ability to rely on past project leadership experience, knowledge to direct team activities. Knowledge of global standards, classification systems across healthcare settings and related coding experience is optimal. Working knowledge of the use of SNOMED CT and ICD-10 is essential. This may be obtained through experience or formal education; additional insight in team project management is required for map leads.

Role and Competencies for the SNOMED CT to ICD-10 Mapping Project

Ability to rapidly acquire knowledge and skill in information retrieval for map development and use of map development tools to supervise and facilitate the map development process between SNOMED CT concepts and ICD-10 code equivalents.

Role Specifics:

Leadership skills with a broad knowledge of medical terminology and medical science principles exemplified by provision of certification of competency in line with existing standards developed by the WHO-FIC-IFHRO Joint Collaboration and/or a record of previous professional background or experience in clinical data management. Computer skills and familiarity with Internet access, navigation and basic software tools are required including familiarity with the IHTSDO Workbench functionality.

Competencies for the SNOMED CT to ICD-10 Mapping project:

1. ICD-10 task requirements

1. Identify classification purpose and applicability
2. Apply the general principles of coding using a classification
3. Define the structure of ICD and its clinical modifications
4. Interpret ICD-10 standards and conventions
5. Classify coded diagnostic expressions and health related condition concepts using ICD-10 guidelines
6. Recognize classification errors and how they occur to prevent future errors in the map
7. Document common causes of discordance between map specialists for future reference and prevention.

2. SNOMED concept model task requirements

1. Identify the basic definitions and structure of the SNOMED CT concept model
2. Describe the differences between SNOMED CT and ICD-10.
3. Recognize the components of SNOMED CT and relationships between concepts with special attention to Clinical Findings, Events and Situations with explicit context
4. Assess and evaluate the SNOMED CT concept semantics
5. Utilize a SNOMED CT Browser and/or search tools
6. Evaluate the SNOMED concept for clarity and definition as specified in the technical documentation for the map project.
7. Document common SNOMED CT related reasons for discordance between map specialists for future reference and prevention.

Job Title: Consensus Manager

1. POSITION PURPOSE:

The main function of the job is to: Provide high level expertise and support for data mapping projects involving the International Health Terminology (SNOMED CT) and ICD-10

The primary task for this position is review of mappings between terminologies and code sets used in health care information systems where there is discordance between map specialists that cannot be resolved by map leads. This process is required when clinical insight and/or a broader knowledge base is required for a final decision for a complex issue. Consensus management is defined in the Map Data Structures document as an “Escalation process whereby discrepant map records from two different sources are reviewed, conflicts are resolved and a reconciled Map Record is sanctioned by the map owners “. (IHTSDO and WHO-FIC).

2. DIMENSIONS:

Number of staff supervised: None.

This position has no direct budget planning responsibility but is expected to use resources provided with discretion and apply prudent time management to the project. Consensus managers work in a team environment with map developers, map leads, and editorial reviewers. Consensus managers will utilize the IHTSDO workbench resources to access the map records requiring attention and will frequently meet by teleconference to discuss and resolve map development issues.

Required behavior and attitudes

- Decisive
- Shares information freely
- Focused on consensus building
- Reliable
- Listens to others points of view

3. PRINCIPAL ACTIVITIES, END RESULTS, AND PERFORMANCE

Rank of Importance	What Do Consensus Managers Do? (Major Activities)	Why Is This Function Performed? (Desired End Result)	Ways to Measure Accomplishment of End Results
1.	Provide content subject matter expertise for mapping projects appropriate to the use case. Expert knowledge of SNOMED CT and experience with (ICD-10) are applied to candidate concepts for mapped relationship designation. Clinical workflow and medical science insight are used to correctly identify the relationship between the SNOMED CT concept and the target ICD-10 code(s).	To enable data capture in SNOMED CT and link it to ICD-10 for specific use cases consensus is required concerning the optimal match between the source and the target. Data maps are used in healthcare information systems to provide semi-automated linkage to increase efficiency through re-use of data.	High quality, successful maps are developed according to the project plan and timeline.
2.	Apply and explain meaning of the source concept and the fully specified name and defining relationships as specified in the SNOMED Users' Guide ³ . Using mapping system software supplied by the project, match this information with the best candidate in the target terminology using all conventions and guidelines that apply for each map record ⁴ . When necessary explain the rationale for the selection to map developers where there is discordance.	To support an efficient map creation process by leveraging technology and facilitating consensus for optimal matches.	Efficient, track-able, mappings with rationale for concept match included and agreed upon by consensus.
3.	Employ negotiation techniques following a standard process for consensus.	For quality control and consistent results	Audit process to confirm optimal performance of map.
4.	Contribute to mapping team activities when concordance cannot be obtained by the map lead or additional review is requested.	To support optimal map results.	Agreement accomplished.

³ Available from

http://www.ihtsdo.org/fileadmin/user_upload/Docs_01/SNOMED_CT_Publications/SNOMED_CT_User_Guide_20080731.pdf

4. **PRINCIPAL CHALLENGES:**

The most typical and the most complex problems that are faced in this position, as well as the long-range challenges are described below. Consensus managers must be self-directed and motivated to plan tasks to achieve operating objectives to advance the highest quality map results to ensure clinical data integrity in use.

A. **Typical Problems:** There will be instances where consensus manager are unable to locate an authorized source for a SNOMED CT concepts to inform the map and confirm the optimal ICD-10 target code(s). There may be instances of disagreement in interpretation that is unable to be resolved by an authorized source making decision on the map record or issue difficult to resolve.

B. **Most Complex Problems:** Reconciliation of differences in opinion or perspectives in complicated maps also, the presence of ambiguous guidelines required by the SNOMED CT structure or ICD-10 conventions, structure or guidelines.

C. **Long-Range Challenges:** Meeting expectations of diverse groups by making changes, enhancements, corrections to the map development process and recommendations for the map source and map target code data systems.

6. **AUTHORITY AND RESPONSIBILITY:**

A. What typical decisions do consensus managers have total authority for making?

Final map target designation or map record disposition at the conclusion of the consensus management process.

B. What typical decisions are referred to others for approval?

Issues of discordance deemed to be important enough to warrant further review or investigation by the standards development organizations that own the terminology involved.

5. REQUIRED KNOWLEDGE AND EXPERIENCE:

Possess expertise in clinical workflow, medical science with insight and technical knowledge in SNOMED CT and ICD-10 use. Foundational knowledge of SNOMED CT and ICD-10 use is required.

6. DESIRABLE KNOWLEDGE AND EXPERIENCE:

Foundational knowledge of SNOMED CT data structure with mapping project involvement is optimal. Project management and consensus building experience is helpful. Clinical insight is very helpful in determining semantic matches important to map development and use.

Role and Competencies for the SNOMED to ICD-10 Mapping Project

Significant experience and clinical insight related to the mapping process and the use of both code sets.

Role Specifics:

- Consensus managers provide final decisions concerning map record disposition.
- Broad knowledge of medical terminology and science principles in line with existing standards developed by the WHO-FIC-IFHRO Joint Collaboration and/or a record of previous professional background or experience with clinical terms.
- Computer skills and familiarity with Internet access, navigation and basic software tools is required.

Competencies for the SNOMED CT to ICD-10 Mapping project:

1. ICD-10 task requirements
 1. Explain ICD Classification system uses and users, and the benefits of using the classification
 2. Apply the general morbidity principles of disease coding using ICD-10
 3. Differentiate morbidity from mortality coding principles and guidelines
 4. Describe the uses of ICD-10 (and its clinical modifications)
 5. Interpret and utilize ICD-10 standards and conventions
 6. Understand the processes for updating and modifying ICD-10

7. Classify coded concepts using ICD-10 guidelines
8. Recognize classification errors and how they occurred and take steps to prevent future errors.
9. Document common causes of discordance or ambiguity for future reference and prevention.

2. SNOMED concept model task requirements

1. Identify the basic definitions and structure of the SNOMED CT concept model
2. Describe the differences between SNOMED CT and classification systems
3. Recognize the components of SNOMED CT and relationships between concepts with special attention to Clinical Findings, Events and Situations with explicit context
4. Assess and evaluate the SNOMED CT concept semantics
5. Utilize a SNOMED CT Browser and/or the IHTSDO workbench and search tools
6. Evaluate the SNOMED concept for clarity and definition as specified in the technical documentation for the map project.
7. Understand the processes for updating and modifying SNOMED CT
8. Provide clinical judgment where warranted for semantic matching between the concept and the classification code.
9. Inform or advance pilot tests of maps for different use cases and settings

3. Consensus management task requirements

1. Follow the prescribed process for gaining consensus for referred map records
2. Provide research support for correct map choice
3. Provide rationale for final map to the mapping team or to the WHO-FIC / IHTSDO harmonization panel when warranted

Annex B: Core Curriculum for SNOMED CT to ICD-10 Map Development

The core curriculum for the SNOMED CT to ICD-10 map is divided into three stages and contains subject information that forms the educational foundations for SNOMED CT to ICD-10 map developers (mapping specialists, map leads and consensus management). Additional content and programs may be added to satisfy individual country and/or organization needs

STAGE 1: ICD-10 Classification Systems Foundation

Required Content for Project Personnel Competency

- 1.1 Purpose and applicability of the ICD-10 International Statistical Classification of Diseases and Related Health Problems, Second Edition
- 1.2 Definition of a disease classification
- 1.3 History of ICD-10 Development
- 1.4 The uses of ICD-10 (and its clinical modifications)
- 1.5 The role of the WHO-FIC Network in classification development and maintenance
- 1.6 General principles of disease classification
- 1.7 Differences between nomenclature, terminology and statistical classification
- 1.8 How the classification specifies disease
- 1.9 Structure of ICD-10
- 1.10 Variable axis classification
- 1.11 Volumes, chapters, blocks
- 1.12 Three and four character subcategories, supplementary subdivisions
- 1.13 ICD-10 standards and conventions
- 1.14 Inclusion and Exclusion terms and glossary descriptions
- 1.15 Dagger and asterisk conventions
- 1.16 Dual coding requirements and guidelines
- 1.17 Meaning and application of grammatical conventions – parenthesis, square brackets, colon,

- brace, ‘NOS’, “Not elsewhere classified” “and, and/or”, point dash
- 1.18 Basic coding guidelines and an overview of chapter specific guidelines
- 1.19 Use of the ICD-10 Volume 1 and Volume 2 books
- 1.20 Use of the WHO Online ICD-10 Browser, e-Book versions and use of encoder software
- 1.21 Understanding the process for updating and modifying ICD-10

STAGE 2: SNOMED Clinical Terms Foundation

Required Content for Project Personnel Competency

- 2.1 Basic definitions and structure of the SNOMED CT concept model
- 2.2 Definition of SNOMED CT Concepts
- 2.3 Description of SNOMED CT Relationships
- 2.4 Hierarchies and the definitional model
- 2.5 Concept status (primitive, fully defined etc)
- 2.6 Differences between reference terminology and classification systems
- 2.8 Defining relationships; differences with qualifiers
- 2.9 Structure of SNOMED CT compared to ICD-10
- 2.10 Components of SNOMED CT and their relationships with special attention to Clinical findings
- 2.11 Events (e.g. 272379006) and Situations with explicit context (e.g. 243796009)
- 2.12 Concept model – Clinical findings
- 2.13 Concept model – Events (272379006)
- 2.14 Concept model – Situations with explicit context (243796009)
- 2.15 Using a SNOMED CT browser
- 2.16 Placement of a concept in the hierarchy and relationships to other concepts
- 2.17 Context of a SNOMED CT concept through relationships as revealed in the browser
- 2.18 Status of a concept
- 2.19 Understanding of process for updating and modifying SNOMED CT

STAGE 3: Clinical Terminology to Classification System Mapping

Required Content for Project Personnel Competency

- 3.1 Principles of mapping between systems and overview of the mapping methodology
- 3.2 Mapping from a reference terminology to a classification and the use of map categories
- 3.3 Map directionality (Forward Maps, Reverse Maps)
- 3.4 Use cases: Map purpose and general examples of terminology to classification use case
- 3.4 Overview of IHTSDO SNOMED CT to ICD-10 mapping process
- 3.5 Mapping heuristics procedures for concept match to ICD-10 codes
- 3.6 Code assignment workflow from analysis of clinical notes
- 3.7 Code assignment workflow from embedded or mapped SNOMED CT concepts
- 3.8 Project specific purpose(s), scope and use cases for mapping SNOMED CT to ICD-10
- 3.9 Project Phases 1(Context Free) and 2 (Patient Context Management)
- 3.10 Technical Documentation for SNOMED CT to ICD-10 Reference Mapping
- 3.11 Search tools and techniques provided in a SNOMED CT Browser
- 3.13 Semantic equivalence of concepts compared to codes in the classification
- 3.14 Conventions of the source and target terminologies important in map development
- 3.15 The need for additional context for a reliable match
- 3.16 Suggesting content for Map Advice where appropriate
- 3.17 Technical structure for rule based mapping of ICD-10
- 3.18 Work process introduction and workflow training
- 3.19 Project data structures and mapping software
- 3.20 Work distributions, productivity and quality expectations and validation process
- 3.21 Side-by-side mapping with Map Lead to establish confidence level and minimum competency
- 3.22 Verification and validation activities for map accuracy
- 3.23 IHTSDO tools and use of the mapping workbench

- 3.24 IHTSDO map toolkit
- 3.25 Software orientation and training process and timeline
- 3.26 Mapping work distribution and work process timeline
- 3.27 Map lead(s) procedures
- 3.28 Consensus management process and map conflict resolution
- 3.29 Testing of maps

Annex C Course Syllabus

Example of Course Syllabus

Details are added about the content of each unit in the educational activities conducted with the mapping specialists, map leads and consensus management appropriate to their roles in the project.

Source: Mapping Special Interest Work Group Members

The Preparing for SNOMED CT to ICD-10 Mapping course is comprised of four units presented in sequential order. Learning objectives are listed for each unit and worksheets and an assessment are provided at the close of each unit to evaluate knowledge retention and proficiency the application of mapping principles and procedures.

Unit 1: ICD-10 Classification

Learning Objectives: At the completion of this unit mapping specialists have the capacity to:

- Describe the purpose of ICD-10 second edition
- Explain its uses and users, and its benefits to health care.
- Describe the components and structure of ICD-10
- Apply the general principles of disease classification to clinical data
- Interpret and apply ICD-10 second edition standards and conventions

Independent Study

[Reading assignments to be determined]

This unit contains four modules and covers the following topics:

1. Purpose and applicability of classification
 - Definition of a disease classification
 - History of ICD-10 development
 - The uses of ICD-10
 - The role of the WHO-FIC Network
2. General principles of disease classification
 - Differences between nomenclature and statistical classification
 - How the classification specifies disease
3. Structure of ICD-10
 - Variable axis classification
 - Volumes, chapters, blocks
 - Three and four character subcategories, supplementary subdivisions
4. ICD-10 standards and conventions
 - Inclusion and Exclusion terms and glossary descriptions
 - Dagger and asterisk conventions
 - Dual coding
 - Meaning and application of grammatical conventions – parenthesis, square brackets, colon, brace, ‘NOS’, “Not elsewhere classified” “and, and/or”, point dash
 - Basic coding guidelines and an overview of specialty guidelines

Hands-On Exercises

- Self-Assessment

Graded Assignment

- Worksheets to be distributed by instructor
- Assessment Quizzes using mapping exercises

Unit 2: SNOMED CT

Learning Objectives: At the completion of this unit mapping specialists have the capacity to:

- Describe what SNOMED CT is, what it is for and how it is implemented and used

- Explain the structure of this reference terminology
 - Describe the SNOMED CT concept model
 - Explain the composition of SNOMED CT and how its different parts are related with special attention to findings, Events and Situations with explicit context
 - Assess and evaluate SNOMED CT concept semantics
 - Utilize a SNOMED CT browser and search tools
- Clinical

Independent Study

- Review the SNOMED CT Users Guide

This unit contains four modules and covers the following topics:

1. Basic definitions and structure of SNOMED CT concept model including the following:
 - Concepts
 - Relationships
 - Descriptions
 - Hierarchies and the definitional model
 - Concept status (primitive, fully defined etc)
 - Context; default context and situations
2. Highlight the differences between reference terminology and classification systems
 - Defining relationships; differences with the use of qualifiers between SNOMED CT and ICD-10
 - Structure of SNOMED CT compared ICD-10 second edition
 - Noting versus counting
 - Noting: termed capture of clinical information using reference terminologies to ensure semantic operability and interoperability to records.
 - Counting: the process of abstracting termed information into classification codes to facilitate secondary use of data.

3. Components of SNOMED CT and their relationships with special attention to Clinical findings, Events and Situations

- Concept model – Clinical findings
- Concept model – Events and Situations with explicit context

4. Using a SNOMED CT browser

- Placement of a concept in the hierarchy and relationships to other concepts
- Context of a SNOMED CT concept through relationships as revealed in the browser
- Status of a concept

Hands-On Exercises

- Browsing SNOMED CT with the IHTSDO Workbench tools

Graded Assignment

- Worksheets to be distributed by instructor
- Assessment quizzes with search and term retrieval exercises

Unit 3: Terminology/Classification Mapping

Learning Objectives: At the completion of this unit mapping specialists will have the capacity to:

- Describe the differences between terminology and classification systems
- Describe why data maps are created
- Identify the different types of terminology to classification system maps
- Describe the purpose, scope and use cases for mapping SNOMED CT to ICD-10
- Evaluate the SNOMED CT concept for clarity and definition as specified in the Technical Documentation for SNOMED CT to ICD-10 Reference Mapping
- Apply principles of mapping between systems using the defined mapping methodology
- Apply mapping methods for concepts
- Recognize the differences in concept matching with a lexical approach

- Identify the technical structure for rule based mapping of ICD-10
- Apply the advice in the IHTSDO map toolkit and/or workbench
- Identify quality assurance principles and processes that support the mapping process
- Use browsers and mapping tools to create, modify, retire and review maps
- Apply the SNOMED CT concept model and ICD-10 system consistently in the mapping process
- Identify and resolve basic quality assurance issues
- Recognize and refer mapping issues that are beyond his/her competence to the next level of review (map leads, consensus management, harmonization panel).
- Prepare / review and manage new map requests.

Independent Study

- Map Technical Guide

This unit contains six (6) modules and covers the following topics.

1. Principles of mapping between systems and overview of the mapping methodology

- Mapping from a reference terminology to a classification
- Map directionality and general use cases and examples
- Overview of SNOMED CT to ICD-10 mapping process

2. Mapping procedures for concepts

- Coding versus mapping process comparison
- Coding workflow process using mapped or embedded SNOMED CT concepts

3. The purpose, scope and use cases for mapping ICD-10

- Purpose of mapping SNOMED CT to ICD-10
- Scope and phases of the map development process
- Use cases for a SNOMED CT to ICD-10 map

4. Technical documentation for SNOMED CT to ICD-10 Reference Mapping

- Source domains and context
- Target domains and context
- Map data structures including Map Group, Map Priority, Map Category, Map Rule and Map Advice
- Authoritative resources
- General approach to mapping process
- Specific Phase I map heuristics to follow
 - Gender
 - Patient age at onset
 - Acquired versus congenital conditions
 - Poisonings
 - External causes
 - Dagger and Asterisk
 - Exclusions (co-morbidities)
 - Neoplasms
 - Location and multiplicity at birth
- Specific Phase II map heuristics to follow
 - Age
 - Congenital versus acquired conditions
- Key Assumptions

5. Technical structure for rule based mapping of ICD-10

- Work process introduction and training
- Map Data structures and software orientation
- Work distribution, expectations and validation process

- Side-by-side mapping with Map Lead
- Verification and validation activities
- IHTSDO tools and use of the mapping workbench
- IHTSDO map toolkit
- Software training
- Work distribution and work process
- Consensus process and map conflict resolution process
- Map lead(s) role and procedures

Hands-On Exercises

Graded Assignment

- Worksheets to be distributed by instructor
- Assessment Quizzes

Resources – teleconferences, listserves, collaborative space, etc.

Materials may be available from the IHTSDO for enhanced preparation. This is the start of a list of materials available that should be used for preparation for this role.

1. WHO ICD-10
 - A. WHO ICD-10, WHO ICD-10 Web-based Training Tool (still in pilot)
 - B. ICD-10 Publications and resources <http://www.who.int/classifications/icd/en/index.html>
 - C. Joint Collaboration ICD-10 Core Curriculum, Training and Certification Program
<http://www.ifhro.org/whofic.php>
2. ICD on Wikipedia ICD on Wikipedia <http://www.wikidoc.org/index.php/ICD>
3. IHTSDO Publications <http://www.ihtsdo.org/snomed-ct/snomed-ct-publications/>
 - A. SNOMED CT User's Manual
 - B. SNOMED CT Clinical Terms Fundamentals

4. SNOMED CT Browsers http://www.nlm.nih.gov/research/umls/Snomed/snomed_browsers.html
5. College of American Pathologists (SNOMED CT Terminology Solutions Self Directed Learning)
<http://www.cap.org/docent/bin/docentisapi.dll/lms,juno.cap.org,2151/?CMD=LOGIN&FILE=catalog/main.js&path=0:Main%20Catalog&ID=116>
6. National e-Health Transition Authority (Au) Video Library <http://www.nehta.gov.au/media-centre/video-library>
7. IHTSDO Workbench Orientation Videos
http://www.healthlanguage.com/download/2009-03-26_10.37_IHTSDO_Workbench_Training.wmv ;
http://www.healthlanguage.com/download/2009-04-30_10.29_IHTSDO_Training.wmf