

1.	Governance	2
2.	Version history.....	2
3.	Objective	3
4.	Working packages.....	3
4.1.	Terminology 3BT-UZB 15.700 diagnoses subset	4
4.2.	Extension all Snomed CT	4
4.3.	Mapping 3BT-Terminologie.....	5
4.4.	Testing & Validation.....	5
5.	General methodology	5
5.1.	Selection concepts.....	6
5.1.1.	Clinical.....	6
5.1.2.	Distinct vs Ambiguous	7
5.1.3.	Specific vs General.....	7
5.1.4.	Actual.....	7
5.1.5.	No synonyms.....	7
5.2.	Pre- versus Post-coordination	8
5.2.1.	Subtype qualification	8
5.2.1.	Time indications	11
5.2.1.	Axis modification	11
5.2.2.	Concept combination and linkage.....	11
5.3.	Translation	12
6.	Specific Rules of Elimination	13
6.1.	Neoplasms.....	17
6.1.1.	Primary malignant neoplasm	17
6.1.2.	Secondary malignant neoplasm	18
6.1.3.	Neoplasm of.....	19
6.1.4.	Staging malignant neoplasms	19
7.	Replacement by post-coordination	19
7.1.	Medication-related problems	20
7.2.	Substance-related problems	20
7.3.	Events.....	21
7.4.	Varia.....	21
8.	Translation	21
9.	Work Flow	25
9.1.	Diagnoses 15.700 First run.....	25
9.1.1.	Selection concepts First run	25
9.1.2.	Translation First run	25
9.2.	Diagnoses 15.700 Second run	26
9.2.1.	Run 2 Fr.....	26
9.2.2.	Run 2 NI.....	27
9.3.	Snomed Extension Run 3	28
9.4.	Reconciliation	28
10.	Data management	28
10.1.	Database	28
10.1.1.	DB Diagnoses 15.700 First run	28
10.1.2.	DB Diagnoses 15.700 Second run.....	29
10.1.3.	DB Extension Run 3	30
10.2.	Work files	31

10.3. Import & Update	31
11. Mandatory reading	31
12. References.....	31

1. Governance

Contract Ctr-n11-01-Serveur terminologique-M.I.M.3

Function	Expert	Organisation	From	To
General project management	Luc Nicolas	FOD/SPF Health Belgium	15/12/2010	
Medical project management	dr. Benny Van Bruwaene	eHealth Belgium	15/12/2010	
	dr. Michel De Jonghe (Fr)	UCL (Louvain)	28/11/2011	31/7/2012
Scientific committee	dr. Etienne De Clercq	MIM	15/12/2010	
	dr. Michel Roland	ULB (Bruxelles)	15/12/2010	31/12/2012
Terminologists	dr. Benjamin Fauquert (Fr)	ULB (Bruxelles)	15/12/2010	
	dr. Manu Berquin (Fr)	ULB (Bruxelles)	15/12/2010	
	dr. Michel De Jonghe (Fr)	UCL (Louvain)	15/12/2010	
	dr. Kurt Mies (NI)	GZA (Antwerpen)	15/12/2010	
	dr. Francois Carbonez (Fr)	ULB (Bruxelles)	15/06/2011	31/3/2012
	dr. Vincent Parmentier (Fr)	ULB (Bruxelles)	15/06/2011	
	dr. Karen Pien (NI)	VUB (Brussel)	7/09/2011	
	dr. Corentin Duiver (Fr)	UCL (Louvain)	7/09/2011	
	dr. Jef Goris (NI)	Domus Medica	7/9/2011	
	dr. Stefaan Viaene (NI)	Domus Medica	7/9/2011	30/4/2012
	dr. Stefaan Bartholomeeusen (NI)	KUL (Leuven)	7/9/2011	
	dr. Philippe Ryckebosch (NI)	UA (Antwerpen)	7/9/2011	
	dr. Peter Leysen (NI)	UA (Antwerpen)	7/9/2011	
	dr. Diego Schrans (NI)	UG (Gent)	7/9/2011	

2. Version history

Date Meetings with adaptation of document	Version
02/02/2011	110202 Start dictionary methodology ULB.doc 110202 Start dictionary methodology NL.doc
05/05/2011	110510 project MIM 2011 methodology.doc
15/06/2011	110615 project MIM 2011 methodology.doc
16/09/2011	110916 project MIM 2011 methodology.doc
14/10/2011	111018 project MIM 2011 methodology.docx
21/11/2011	111121 project Terminology WP Diagnoses methodology.docx

Date Meetings with adaptation of document	Version
16/12/2011	111216 project Terminology WP Diagnoses methodology.docx
3/2/2012	120203 project Terminology WP Diagnoses methodology.docx
28/2/2012	120228 project Terminology WP Diagnoses methodology.docx
30/3/2012	120330 project Terminology WP Diagnoses methodology.docx
27/4/2012	120427 project Terminology WP Diagnoses methodology.docx
22/5/2012	120522 project Terminology WP Diagnoses methodology.docx
27/7/2012	120727 project Terminology WP Diagnoses methodology.docx
28/8/2012	120828 project Terminology WP Diagnoses methodology.docx

3. Objective

The purpose is to constitute a Reference terminology for Diagnoses based on Snomed and translated in French and Dutch.

The objective of the reference terminology is to provide a selection of validated clinical concepts for reporting in the electronic medical record to the physicians and other care takers. These concepts will be also the standard in Kmehr-messages for communication between systems.

These concepts should be cross mapped with all secondary coding systems (ICPC, ICD-..., RIZIV-INAMI, ...) in order to avoid double data entry and coding.

Registration in the medical record requires highly granular concepts.

Snomed is a vast terminology system with this same objective and was created by combining SNOMED Reference Terminology (SNOMED RT) and Clinical Terms Version 3 (CTV3), formerly known as the Read Codes.

When faced with SNOMED CT® terms in a translation context, it is useful to bear in mind that the terminology is not 100% consistent and that errors or inconsistencies do occur on the word as well as the system level (Asta Hoy, 2006, Spackman et al. 2002 & 2004, Bodenreider et al. 2004).

Therefore, it was decided to build an independent Belgian terminology which is linked to Snomed CT as it will be linked to other relevant classifications and coding systems.

In a first step all the relevant Snomed CT concepts will be selected and will be translated in French and Dutch resulting in a Snomed CT subset.

In a second step new concepts, not present in Snomed CT, and needed in the Belgian context will be added resulting in an extension of Snomed CT.

All selected concepts will be identified with a unique Belgian identifier (IBUI).

4. Working packages

The working group 'Findings and Diagnoses' is the first project started at the end of 2010.

It starts with the validation of the terminology subset resulting from the merge 3BT-UZB which will be extended with all useful concepts coming from the Snomed CT version 20110731.

Accidents and social factors (E- and V-codes in ICD-9-CM) are needed for hospital discharge registration and will therefore be added to the core terminology of findings and diagnoses.

After the completion of the reference terminology of diagnoses, the terminology will be mapped with the 3BT thesaurus in order to allow the transition from the 3BT to the new terminology without losing information.

4.1. Terminology 3BT-UZB 15.700 diagnoses subset

A terminology of diagnoses (n=15.700) resulted from a merge of the thesaurus 3BT developed by the department of general practice of the university U.L. Brussels and the university U. Gent with the controlled medical vocabulary of the university hospital UZB.

The merged terminology was completely mapped to Snomed CT.

All concepts of this terminology will be reviewed and evaluated according to a set of formal guidelines.

After a first run, all concepts will be presented again to another terminologist with the previous evaluation and translation. This procedure will serve as a peer review before going to the WP2 Extension.

4.2. Extension all Snomed CT

The initial 3BT-UZB subset will be extended with Snomed CT concepts version 20110630.

All concepts will be presented together with the 15.700 validated subset.

Sample:

SNOMEDID	FULLYSPECIFIEDNAME	Concept ok	Nl_Belgium	Fr_Belgium	FR_Canada
D0-0119B	Boil of upper limb (disorder)				
D0-0119C	Pilonidal disease of natal cleft (disorder)				
D0-01200	Abscess of skin AND/OR subcutaneous tissue (disorder)				0-012 Abcès de la peau
D0-01201	Abscess of digit (disorder)				abcès d'un doigt/orteil
D0-01202	Abscess of finger (disorder)	x	abces van de vinger	abcès du doigt	abcès d'un doigt
D0-01203	Abscess of foot (disorder)	x	abces van de voet	abcès du pied	
D0-01204	Pulp abscess of finger (disorder)				panaris
D0-01205	Abscess of elbow (disorder)	x	abces van de elleboog	abcès du coude	
D0-01206	Loin abscess (disorder)				
D0-01208	Abscess of skin area excluding digits of hand or foot (disorder)				
D0-0120B	Prepatellar abscess (disorder)	x	prepatellair abces	abcès prérotuléen	

SNOMEDID	FULLYSPECIFIEDNAME	Concept ok	Nl_Belgium	Fr_Belgium	FR_Canada
D0-0120C	Abscess of face (disorder)	x	abces van het gelaat	abcès de la face	
D0-0120D	Abscess of limb (disorder)				
D0-0120E	Abscess of cheek (disorder)	x	abces van de wang	abcès de la joue	
D0-0120F	Abscess of lower limb (disorder)	x	abces van het been	abcès de la jambe	
D0-01210	Abscess of toe (disorder)	x	abces van de teen	abcès d'un orteil	abcès d'un orteil
D0-01211	Abscess of big toe (disorder)				
D0-01212	Abscess of upper limb (disorder)	x	abces van de arm	abcès du bras	

4.3. Mapping 3BT-Terminologie

After the completion of the reference terminology of diagnoses, the terminology will be mapped with the 3BT thesaurus.

In order to avoid useless mapping of concepts never used, the really used IBUI-codes will be gathered from different systems: Maisons médicales, Sosoeme, Wachtpoort,....

All IBUI-codes not retrieved from real life registration will be retired.

9.672 concepts of the reference terminology have already an exact match.

The 3BT items without corresponding concept in the reference terminology will be analyzed for further mapping. Some 3BT concepts will be synonyms or quasi synonyms of existing concepts in the reference terminology, some will be combined concepts and can be coded with a combination of concepts, some will be invalid (ambiguous, too general): they will be retired.

Valid 3BT concepts which are missing in the reference terminology will be added to the reference terminology as a Snomed extension.

4.4. Testing & Validation

Once the terminology is finished it will be validated through real life use in general practice and hospitals.

Testing the terminology entails the use of the terminology in electronic medical records of G.P. and/or hospitals. The testing physicians should have access to a web based terminology management system in order to report errors and missing concepts.

Submission of the Belgian reference terminology to Holland and France/Canada is considered.

5. General methodology

Validation of the general and specific guidelines is a dynamic process.

The Methodology and Amendments will be managed by an iterative Questionnaire in XLS.

New Guidelines are proposed at every meeting. In the inquiry.XLS the Proposal of Guideline is presented with the question 'OK?'. Answer is 'Yes' if the terminologist agrees and 'No' if he/she doesn't. Put a Comment or Suggestion if needed.

All items with consensus are documented in Methodology.doc with the date of approval (unless it was approved from the beginning).

Items without consensus will be resubmitted with all answers and/or discussed during the next meeting.

All approved guidelines will be reviewed with specific queries on the final Terminology at the end of the second run and at the end of the Extension.

5.1. Selection concepts

Snomed CT is the starting point for the Belgian Reference terminology. Snomed concepts will be selected and translated unless they do not comply with the guideline set for good registration taking into account the metadata as defined in the homologation criteria of health care records in Belgium.

The Belgian reference terminology aims at clinical documentation and reporting. The quality (granularity) of the concepts is directly proportional to the care with which options (clinical protocols, alerts, studies) are presented to the user (Tim Benson, 2010).

This granularity is therefore higher than required for epidemiology (ICD) or reimbursement purposes (RIZIV/INAMI, DRG).

This does not mean that the reference terminology should be extended to cover all detail.

Standardization is needed to the point decision and administrative support is required. In the electronic patient record full detail of the concepts will be described in free text.

Because the reference terminology can be used as a vocabulary in electronic health records, the choice of a concept is restricted according to general guidelines (cf Infra).

The objective is to start with a vocabulary covering more than 90 % of diagnoses and procedures without biasing registration with terms which might be ambiguous or superfluous.

The strategy is to start off with a limited corpus of agreed terms and to extend this vocabulary with new terms based on the real life use of care takers who will be able to request new terms if they feel they don't find the proper concept.

For diagnoses and procedures, it is estimated that 30.000 concepts (without synonyms) will be sufficient for each domain.

In order to know the exact meaning of a Snomed concept it is sometimes necessary to look up the parents, children and/or attributes of a concept in the Snomed ontology.

Any Snomed browser can be used, e.g. CliniClue.

CliniClue can be installed from <http://www.cliniclue.com/software> . The Belgian terminologist in this project can accept the conditions of use since he/she is covered by the agreement of the IHTSDO to use Snomed.

Guidelines for the selection for the controlled medical vocabulary:

5.1.1. Clinical

'Clinical' concepts are concepts as used in electronic medical records and in medical reports.

If there is doubt, check the term in English (or French, NI) in approved sources of information (special dictionaries, textbooks, specific homepages on the Internet, medical literature).

- English: <http://gateway.nlm.nih.gov/gw/Cmd>
- In French <http://www.cismef.org/>

- All languages: Google (literature and/or professional websites)

The existence of a concept in a given classification is not a sufficient condition to accept the concept because the concepts in a classification can be too broad for registration.

Consultation of a specialist in the domain might be useful/necessary.

5.1.2. Distinct vs Ambiguous

Concepts should be clear and not ambiguous.

Homonyms are excluded.

Terms containing '... or... ' are excluded. They are often used in classifications but never in a medical record. One could split the term in two terms apart as far as the apart concepts exist in Snomed.

The same is true for terms containing '... other... ' In this case one doesn't know what concept is meant if one doesn't know the given hierarchy of the classification.

5.1.3. Specific vs General

The granularity of the chosen concepts should satisfy the needs of all health care professionals (general practice, super specialists, nurses, ...).

Vague terms are to be avoided. E.g. 'cardiac disorder' is too general.

On the other hand, different levels of specificity are to be accepted because the health care professional is not always able to give all needed specificity.

E.g. in the history taking, the patient might refer to a previous myocardial infarction without knowing if it was with or without a ST-elevation. Although 'myocardial infarction' is not very specific, it should be included as a concept.

Very specific and rare conditions should be accepted with 'x' if they are compliant with the other criteria. E.g. 'Fort Bragg Fever'.

In these cases one may mark a 'x' in the column 'specific'. Since there are no formal criteria to define 'specificity', this qualification is optional.

5.1.4. Actual

Because of the evolution of medical knowledge, some concepts might become obsolete.

E.g. Before the Hepatitis-C testing, 'Hepatitis non-A non-B' was a currently used concept which lost his validity after new diagnostic techniques.

5.1.5. No synonyms

One concept in the reference terminology excludes all other concepts.

Sometimes, the difference between two Snomed concepts can be so close that the choice between the two concepts cannot be done in an univocal way. Then one concept will be accepted and the other will be retired.

E.g.

'foot ulcer' and 'foot ulcer without complication'

'benign hypertension' vs 'benign essential hypertension'

In order to find synonyms the concepts will be presented sorted by SnomedId which follows a semantic order. For diagnoses, the concepts will be presented with ICD-9-CM and/or ICD-10 for the same purpose.

5.2. *Pre- versus Post-coordination*

Natural language represents complex concepts by the combination of concepts using words. A normal dictionary will explain the words (components or atomic concepts) and will not explain all combined concepts.

Natural language follows a post-coordinated approach of representing complex concepts.

Electronic health record systems use to represent complex concepts by a single code. This is what we call a pre-coordinated approach. A terminology completely based on pre-coordination will lead to an infinite number of concepts due to the infinite number of possible combinations of different concepts.

In the health record we can distinguish primary concepts (gender, diagnosis, treatment, encounter, event, social context, medication, procedure, observable entity) and attributes (body structure, organism, substance, physical force, physical object).

Snomed allows the use of post-coordinated expressions to represent a meaning using a combination of two or more codes.

The combination of a primary concept with attributes to refine the meaning of the concept is called 'subtype qualification'.

Axis modification is where the post-coordination fundamentally changes the meaning of the concept, rather than simply refines it. E.g. 'asthma' vs. 'absence of' 'asthma'. 'absence of' changes completely the meaning of 'asthma'.

The combination of primary concepts with a causal or temporal relationship is called 'concept combination and linkage'.

E.g. "chronic renal failure" "due to" "hypertension"

5.2.1. **Subtype qualification**

Subtype Qualification is where the concept is elaborated (that is, linked with an attribute concept) in such a way as to result in a post-coordinated expression which is equivalent to a subtype of the unelaborated concept (T. Benson, 2010). For example, the concept 'asthma' can be qualified with the attribute concept 'severe' to produce an expression that is the subtype of the concept 'asthma'.

Snomed contains pre-coordinated concepts (disorders, procedures,...) and atomic concepts (organism, site, substance, gender ...) which can refine the primary concept.

When a pre-coordinated concept ("fracture of tibia") is defined in Snomed by his components ("fracture", "site"= "tibia"), the concept is fully defined [IsPrimitive]=0.

The pre-coordinated concept "fracture of tibia" can be replaced by the combination of three concepts "fracture", "site"= "tibia").

When a complex concept is not defined by his components, the concept is labeled [IsPrimitive]=1.

Components cannot be defined further because they are the lowest level of granularity (atomic concepts). They are always [IsPrimitive]=1.

The definition of a pre-coordinated concept by primary concept with his attributes is done in Snomed compositional grammar : Cf. Chapter B.3 of the document:
<http://dwidgis02.salud.gob.mx/forohl7/html/infrastructure/terminfo/terminfo.htm#TerminfoAppendRe fsGrammar>

=	Attribute value prefix	<p>Each of the attributes that make up a refinement consists of an attribute name and an attribute value. The attribute name precedes the value and is separated from it by an equals sign ("=").</p> <p>The attribute name is represented by a concept identifier and the attribute value. The attribute value may be represented by a concept identifier as in the following example or by a nested expression (see example later in this table).</p> <p>The following example specifies a bacterial infectious disease <i>caused by streptococcus pneumoniae</i>.</p> <p>87628006 bacterial infectious disease : 246075003 causative agent = 9861002 streptococcus pneumoniae </p>
,	Attribute separator	<p>A refinement may includes more than one attribute. In this case, a comma (",") is used to separate attributes from one another.</p> <p>The following example specifies a bacterial infectious disease affecting the <i>lung and caused by streptococcus pneumoniae</i>.</p> <p>87628006 bacterial infectious disease : 246075003 causative agent = 9861002 streptococcus pneumoniae , 363698007 finding site = 39607008 lung structure </p>
(exp)	Nested expression	<p>The value of an attribute may be represented by an nested expression rather than a single concept identifier. In this case, the nested expression is enclosed in parentheses.</p> <p>The following example specifies a bacterial infectious disease affecting the <i>left upper lobe of the lung and caused by streptococcus pneumoniae</i>. The nested expression localizes and lateralizes the site of the disease.</p> <p>87628006 bacterial infectious disease : 246075003 causative agent = 9861002 streptococcus pneumoniae , 363698007 finding site = (45653009 structure of upper lobe of lung : : 272741003 laterality = 7771000 left)</p>
<<	This concept or any subtype permitted	<p><<71388002 procedure </p> <p>Either the concept "procedure" or one of its subtypes SHALL be used. Note: this differs from the "<=" symbol used to indicate the same constraint in other HL7 specifications. The reason for the difference is to limit the use of "=" as the operator that joins an attribute name and an attribute value in the un-extended compositional grammar</p>

<	Any subtype of this concept (but not the concept itself)	<p> procedure : 363704007 procedure site = (29836001 hip region structure : 272741003 laterality = <182353008 side)</p> <p>The procedure site SHALL be the value "hip region structure" and SHALL include the attribute "laterality" The value of "laterality" SHALL be a subtype of "side" but SHALL NOT be "side" itself.</p>
!	This concept is prohibited and SHALL NOT be used.	<p>71388002 procedure : 363704007 procedure site = (29836001 hip region structure : !272741003 laterality)</p> <p>The procedure site SHALL be the value "hip region structure" and SHALL NOT include the attribute "laterality". Note: This example conflicts with the SNOMED CT compositional grammar as not value is supplied for the laterality attribute. Since the laterality attribute is not permitted, it makes no sense to provide a value. Alternatively a dummy value could be provided but it has been omitted here and in the examples in this document as its would decrease rather than enhance clarity.</p>
!<	This concept and all its subtypes are prohibited and SHALL NOT be used.	<p>71388002 procedure : 363704007 procedure site = (29836001 hip region structure : ~272741003 laterality = !<66459002 unilateral)</p> <p>The procedure site SHALL be the value "hip region structure" and MAY include the attribute "laterality" The value of "laterality" SHALL NOT be "unilateral" or a subtype of "unilateral".</p>

OR	Where two or more values are permitted the set of conditions and the individual expressions SHALL both be enclosed in standard curved brackets () and the word "OR" SHALL be placed between the expression.	<p>[71388002 procedure : 363704007 procedure site = (29836001 hip region structure : ~ 272741003 laterality =(7771000 left) OR (24028007 right))]</p> <p>The procedure site SHALL be the value "hip region structure" and MAY include the attribute "laterality" The value of "laterality" SHALL be either "left" or "right".</p>
AND	Where two or more conditions are both required to apply the individual expression SHALL be enclosed in standard curved brackets and the word "AND" shall be placed between the expressions. ((exp1) AND (exp2))	<p>[71388002 procedure : 363704007 procedure site = (29836001 hip region structure : ~272741003 laterality =((<182353008 side) AND (!<66459002 unilateral)))]</p> <p>The procedure site SHALL be the value "hip region structure" and MAY include the attribute "laterality" The value of "laterality" SHALL be a subtype of "side" AND SHALL NOT be either "unilateral" or a subtype of "unilateral".</p>

The Terminologist will read the section 6.2.2.3 (Attributes to define 'Clinical Findings') and 6.2.2.10 (Attributes to define 'Events') of the SNOMED_CT_Technical Implementation Guide_Current-en-US_INT_20120131.pdf in order to follow the approved attributes for the primary concepts (clinical finding, event) whenever possible.

5.2.1. Time indications

In the medical record, any element will be defined with a start date/time and a stop date/time. The relationship between the time of the event and today is not given in the terms/concepts but with the information of the meta-data.

A myocardial infarction of today becomes an old infarction after a certain time.

Avoid concepts combining a primary concept with Time indications, e.g. 'Old ...' 'Recent ...' 'First episode ...' 'first trimester' ...

5.2.1. Axis modification

Axis modification is where the post-coordination fundamentally changes the meaning of the concept, rather than simply refines it.

Typical instances are

'family history of '

'absence of' and other negative expressions

In order to avoid the explosion of the terminology, pre-coordinated concepts with axis modification are eliminated and are replaced by post-coordination in the medical record of the axis modifier with the primary concept.

5.2.2. Concept combination and linkage

In the medical record, the physician might want to indicate the relationship between two concepts which are recorded in their own right (e.g. a diagnosis and a treatment) with a linkage concept (e.g. 'reason for', 'indication for', 'caused by', 'due to').

The structure of the electronic patient record should provide the possibility to define relationships between the different primary elements (diagnosis, treatment, encounter, event, medication, procedure).

A concept combination should be represented by the registration of the two concepts apart and their relationship represented by a triple: concept1 – relationship type – concept2

E.g.

Concept 1: primary malignant neoplasm of vulva

Concept 2: widespread metastatic disease

Triple (relationship): Concept 2 - 'Due to' - concept 1

In general Snomed terms/concepts which combine primary concepts are to be avoided.

Combined concepts can't be 'deleted' when the distinctive concepts are not available so that the combined concept cannot be registered with a distinctive relationship.

E.g. 'Fetal blood loss from cut end of co-twin's cord'

Combined concepts which refer to a specific pathological process and therapy/prognosis should be accepted:

E.g.

1. diabetic retinopathy
2. post-radiation maculopathy

5.3. Translation

In the development of a reference terminology one focuses on the selection of the concept and one preferred term in Fr and NL.

Although the same concept can be described with several terms, one preferred term will be selected in order to keep the vocabulary concise and to maximize the unity of language.

Since the preferred term will be the standard interface for the physician, the term should be univocal without further explanation.

In a second phase, some diagnoses, procedures can be documented in the terminology server with a full description and/or graphic interface, but this information will seldom be consulted by the health care professional. The preferred term will be the interface and should serve as a mnemonic.

The single compulsory criterion of the translated preferred term is the exact correspondence with the Snomed CT concept.

This does not mean that the English term should be translated literally.

E.g. 'secondary malign neoplasm' == 'metastase' in NL.

To some extent, techniques like borrowing or literal translation may be recommended as long as concept equivalence is ensured: the resulting target language terms will often be internationally recognizable and psychologically acceptable to clinicians, and they make it possible to conform with the structure of SNOMED CT®. However, several more genuinely functionalist techniques may often be preferable, for instance transposition, amplification/description, and established equivalents.

In order to keep a unity of language, guidelines are provided (Hoy Asta, 2006, IHTSDO, 2008):

- Unambiguity (a term having the status of "preferred term" must not refer to more than one concept in the hierarchy in question)
- Linguistic correctness (national syntactic and orthographic rules must be complied with)
- Motivation (immediately understandable terms, i.e. terms reflecting the characteristics of the underlying concept, should be preferred)
- International recognizability (terms based on Latin and Greek word elements should be preferred)
- Psychological acceptability (clinicians' habits should be taken into account whenever possible)
- Systematism & consistency (similar morphological and syntactical solutions should be sought for terms covering semantically similar concepts).

Unfortunately, these requirements will often be in conflict. Psychological acceptability tends to be an obstacle to compliance with several other principles. E.g. Commonly used and accepted eponyms such as Apgar score or Down syndrome are at odds with the wish for motivation (Asta Hoy, 2006).

General guidelines IHTSDO, 2008:

1. Singular preferred unless the concept necessarily involved multiples. Follow English preferred term.

2. Description preferred over eponym. Combine the Eponym ev. with the medical term. Eg. Duchenne muscular dystrophy
3. Lower case letter in the first word is recommended, unless it is an eponym or a proper name. Follow international taxonomic names: <http://www.ncbi.nlm.nih.gov/Taxonomy/> e.g. Chlamydia pneumoniae
4. No abbreviations or only widely used abbreviations (ev. with full description)
5. Prefer a noun over adjective « de la prostate » vs. « prostatique »
6. Use reference vocabulary in the target language.
Widely recognized dictionaries in
NI: Zakwoordenboek der Geneeskunde, Kluwer.
Fr: Dictionnaire Illustré Des Termes De Médecine, Prodim
http://www.prodim.be/n_garnier04.htm

Browsers of translated WHO classifications can be useful for the choice of a preferred term. E.g. ICD-10:

Fr:

<http://taurus.unine.ch/icd10?term=>

<http://dictionnaire.academie-medecine.fr/>

NI: <http://class.who-fic.nl/browser.aspx?scheme=ICD10-nl.cla>

The Dutch Hospitals thesaurus might help although he is not final:

<http://www.dutchhospitaldata.nl/LBZ/Thesaurus.php#inzagemodel>

7. Consultation of a medical specialist in the domain might be useful.

6. Specific Rules of Elimination

When a Snomed concept is not accepted and thus eliminated the reason why the concept is not accepted will be documented.

This elimination can be done manually by the terminologist or in an automatic way by a SQL query. Eg. if 'family history of' then eliminate the concept [concept ok]='d' [rule]= axis modification

This allows the terminologists and users (health care professionals) to understand how the terminology is built and it allows easy and consistent corrections if needed.

Automatic rules are proposed to the all group of terminologists and are documented when accepted.

When a rule to eliminate a type of Snomed concepts is accepted on a meeting, the rule is applied filtering the Snomed words on the English label or on the 'is a' relationships.

[concept ok] is put on 'd'

[rule] is filled out with a rule from the Methodology.doc

Wording English label Snomed	Rule	Comment	Date meeting
blood vessel of	Too vague	Accepted after lecture of "120727 Methodology.doc"	27/7/2012
effects of	Too vague		27/4/2012
Finding of	Too vague		
peripheral nerves of	Too vague		

Wording English label Snomed	Rule	Comment	Date meeting
sequelae	Too vague and time indication		27/7/2012
disease	Too vague	'disease' 'due ... disease..' 'vascular disease' 'pulmonary disease' 'renal disease ...' 'heart disease ...' 'liver disease ...' 'acute disease of ' 'chronic disease of' are eliminated because the concept is too vague.	27/7/2012
mechanical complication of	Too vague		27/7/2012
multiple	Too vague	Concepts 'multiple' are often too vague and are eliminated in that case. They will be replaced by the combination of the different instances this term refers to. Typical concepts e.g. 'Multiple sclerosis' are accepted.	27/7/2012
abnormal	Too vague		28/8/2012
..not spec...	Ambiguous		11/10/2011
..or ...	Ambiguous		11/10/2011
..other...	Ambiguous		11/10/2011
and/or	Ambiguous		11/10/2011
clinically significant	Ambiguous		11/10/2011
deep	Ambiguous		27/7/2012
finding site not precise	Ambiguous		11/10/2011
idiopathic	Ambiguous		11/10/2011
ill-defined	Ambiguous		27/7/2012
uncertain	Ambiguous		11/10/2011
undetermined	Ambiguous		11/10/2011
unspecified, specified	Ambiguous		11/10/2011
deep full thickness burn of x with loss of body part	Quasi synonym third degree burn		27/7/2012
foreign body left	Quasi synonym foreign body (finding)		27/7/2012
partial thickness burn	Quasi synonym second degree burn		27/7/2012
perinatal	Quasi synonym neonatal		3/2/2012
superficial foreign body	Quasi synonym splinter		27/7/2012

Wording English label Snomed	Rule	Comment	Date meeting
traumatic injury	Quasi synonym injury		3/2/2012
superficial injury of	Quasi synonym 'splinter'		27/7/2012
Traumatic blister	Quasi synonym Blister		27/7/2012
Traumatic division	Quasi synonym division		27/7/2012
amputated through	299214002 amputated through elbow is a status, postsurgery. The concept is redundant with the operation 23425005 amputation of arm through elbow 299214002 amputated through elbow Concept_ok='d' 23425005 amputation of arm through elbow Concept_ok='x'		3/2/2012
Malignant melanoma of skin	Quasi synonym Malignant melanoma		27/7/2012
detected	Axis modification		27/7/2012
episodic	Axis modification		27/7/2012
excluding	Axis modification		28/2/2012
family history of	Axis modification		13/12/2011
recurrent	Axis modification		28/2/2012
relapse	Axis modification		28/2/2012
remission	Axis modification		28/2/2012
suspected	Axis modification		28/2/2012
disorder excluded	Axis modification		28/2/2012
clinical finding absent	Axis modification		28/2/2012
differential diagnosis	Axis modification		28/2/2012
current	Time indication		27/4/2012
during	Time indication		27/7/2012
history of	Time indication		13/12/2011
in the puerperium	Time indication		11/10/2011
juvenile	Typical instances are accepted. Eg. Juvenile osteochondritis		27/7/2012
infant	Typical instances are accepted.		27/7/2012
adult	Typical instances are accepted.		27/7/2012
late effect	Time indication		3/2/2012
postoperative	Time indication		11/10/2011
postpartum	Time indication		11/10/2011
present	Time indication		
acquired	The non congenital disorder can be acquired or the origin		23/11/2011

Wording English label Snomed	Rule	Comment	Date meeting
	<p>can be unknown. Because it is not always clear if a disorder is acquired or congenital, the 'acquired concept' can be ambiguous and thus is withdrawn.</p> <p>When the parent concept without 'acquired' doesn't exist, the 'acquired concept' is accepted and translated with NL: 'verworven' Fr: 'acquis'.</p>		
urine microscopy	Concept combination		27/7/2012
in pregnancy	Concept combination		11/10/2011
injury due to	Concept combination		3/2/2012
o/e	Concept combination		27/4/2012
observation	Concept combination		27/4/2012
on examination -	Concept combination		27/4/2012
Traumatic division	Concept combination		27/7/2012
with complication, Complicated, Complication of	Concept combination		27/7/2012
with laceration of	Concept combination		27/7/2012
'injury' , 'effect' , 'effects', 'due to'	<p>Injury due to... an event, Effect due to... an event, Effects due to... an event (explosion, air pressure,...)' are concepts combining a non specific clinical finding with an event. All these concepts should be coded with two different concepts/codes (one specific code for the clinical finding and one for the event) combined with the linkage concept 42752001 caused by </p>		
Secondary to	In the meaning "due to"		3/2/2012
confirmed	Concept combination		28/8/2012
closed	Negative expression		3/2/2012
isolated	Negative expression		27/7/2012
nontraumatic	Negative expression		27/7/2012
nonvenomous	Negative expression		23/11/2011
without	Negative expression		11/10/2011

Wording English label Snomed	Rule	Comment	Date meeting
normal	Unanimity 120727 inquiry.xls		27/7/2012
secondary	In the meaning 'not congenital', when the same concept without 'congenital' exists.		3/2/2012
at risk	replaced by postco 410519009 at risk		28/9/2012
single episode	negative expression & time indication		28/9/2012
Benign neoplasm of skin of	too vague		28/9/2012
Iatrogenic	replaced by postco 42752001 caused by		28/9/2012
non-organic	negative expression		28/9/2012
residual	too vague & postco caused by		28/9/2012
Traumatic arthropathy	replaced by postco 42752001 caused by		28/9/2012
Traumatic dislocation	replaced by postco 42752001 caused by		28/9/2012
Traumatic perforation	replaced by postco 42752001 caused by		28/9/2012
Traumatic subluxation	replaced by postco 42752001 caused by		28/9/2012
"persistent"	replaced by postco 62459000 chronic persistent		28/9/2012
"transient"	replaced by postco 14803004 transient		28/9/2012
developmental	replaced by postco 5294002 developmental disorder		28/9/2012

6.1. Neoplasms

27/7/2012

6.1.1. Primary malignant neoplasm

Physicians don't speak about a 'primary malignant neoplasm' but about a 'malignant neoplasm' with which term they mean 'primary malignant neoplasm'. Snomed provides 'malignant neoplasm' as a synonym of 'primary malignant neoplasm'

ICD-10 uses always the same logic: 'malignant neoplasm' == 'primary malignant neoplasm' and 'secondary malignant neoplasm' == 'metastasis'

In Snomed the term 'malignant neoplasm' is sometimes used as a 'primary malignant neoplasm' (cf infra 'malignant neoplasm of interlobular bile ducts' which in fact is a 'primary malignant neoplasm of interlobular bile ducts') and sometimes as the parent of 'primary malignant neoplasm' and 'secondary malignant neoplasm' (cf infra 'malignant neoplasm of intrahepatic gall duct').

Awaiting a final conclusion of the IHTSDO, the following procedure will be followed:

The parent concepts of primary and secondary malignant neoplasm are rejected [Concept_ok] = 'd'.

The concept 'primary malignant neoplasm' is also used for a malignant neoplasm when it is uncertain if the neoplasm is primary or secondary.

In post-coordination a primary malignant neoplasm is coded:

372087000 | primary malignant neoplasm | 363698007 | finding site | = < 123037004 | body structure |, 116676008 | associated morphology | = < 86049000 | neoplasm, malignant (primary) |, 399566009 | TNM category | = < 399566009 | TNM category |

All concepts 'malignant neoplasm' which are not a parent of 'secondary malignant neoplasm' are accepted as being a 'primary malignant neoplasm' and are translated as 'maligne neoplasma' and 'tumeur maligne'.

'carcinoma' and 'malignant tumor' are quasi synonyms of 'malignant neoplasm' / 'primary malignant neoplasm'.

They are eliminated ([Concept_ok] = 'd') if an equivalent exists with the same finding site. If there is no equivalent, the concept is accepted and translated as 'maligne neoplasma' and 'tumeur maligne'. 'primary malignant neoplasm' gets priority over 'malignant neoplasm' with priority over 'malignant tumor' with priority over 'carcinoma'.

The concepts 'overlapping tumor' are eliminated and are replaced by post-coordination which allows the definition of the neoplasm and the definition of all sites in one compound expression.

6.1.2. Secondary malignant neoplasm

In post-coordination a secondary malignant neoplasm is coded:

[128462008 | secondary malignant neoplastic disease |, 363698007 | finding site | = < 123037004 | body structure | and is linked to the primary neoplasm with the linkage concept 42752001 | due to |

405843009 | widespread metastatic malignant neoplastic disease | is linked to the primary neoplasm with the linkage concept 42752001 | due to |

The few pre-coordinated instances are eliminated.

384962004 | site involved by direct extension of malignant neoplasm | will be post-coordinated with [Rule]= 363698007 | finding site | = < 123037004 | body structure | to indicate the localization of the organ of invasion.

The concept is linked to the primary neoplasm in the medical record with the linkage concept 42752001 | due to |

The pre-coordinated instances are eliminated.

The concepts 'tumor invasion' and 'malignant tumor involving X by separate metastasis' are quasi synonyms of 384962004 | site involved by direct extension of malignant neoplasm | and are eliminated.

The concepts 'metastasis from' are eliminated because it is not clear where the metastasis is located.

6.1.3. Neoplasm of

When the morphology of a neoplasm is not yet known (absence of an anatomic-pathologic result) or when the given morphology does not indicate the prognosis ‘benign’ vs. ‘malign’, the general concept ‘neoplasm of’ is used.

‘Neoplasm of uncertain behavior’ is a quasi synonym of ‘neoplasm of’ and the concepts are eliminated [concept ok] = ‘d’.

The term ‘Tumor of’ is a quasi synonym of ‘neoplasm of’. All ‘Tumor of’ concepts are eliminated unless no ‘neoplasm of’ exists.

The concepts ‘mass of’ mean there is a mass found which can be a neoplasm but also something else (cyst, abscess,...). It is a common clinical finding. These findings will be accepted.

6.1.4. Staging malignant neoplasms

The staging of malignant neoplasms will be post-coordinated. All pre-coordinated concepts are eliminated.

[concept ok]=‘d’

[rule]= postco 'tumor specification'

Eg. 423600008 | large cell carcinoma of lung, TNM stage 4 |

7. Replacement by post-coordination

Most primary Snomed concepts are pre-coordinated with attributes. They are accepted if they comply with the general rules.

One might prefer to eliminate pre-coordinated Snomed concepts and replace them by post-coordination in the medical record for several reasons:

- The pre-coordinated Snomed concept is extremely pre-coordinated and thus rare and/or too specific, too complex
- One of the components comes from another coding system than Snomed or points to another concept set (e.g. pharmacy for ordering, billing). E.g. ATC for medication or code system for medical material.

If pre-coordinated concepts are withdrawn, the concept with the required attributes through which the pre-coordinated concept will be replaced should be defined.

E.g.

Snomed Term	Snomed CT number	Concept OK?	Rule
Motor vehicle traffic accident involving collision with another motor vehicle, disabled, passenger on motor cycle injured	214118003	‘d’: To be eliminated	‘postco’ (Will be replaced by 37169002 collision and defining attributes)

In order to cover the eliminated pre-coordinated concept a rule of post-coordination will be specified with Snomed compositional grammar.

E.g.

Snomed Term	Snomed CT number	Concept OK?	Rule
collision	37169002	'postco': defining attributes needed	< 303069001 person in the transport environment , 246075003 causative agent = < 36030000 transport vehicle , < 285202004 community environment

7.1. Medication-related problems

In Belgium the authentic source for medication uses the Belgian CNK code as the most granular identifier for medication. The CNK-code is now linked to ATC but not yet to Snomed.

To register medical problems related to medication the medical problem will be coded with a Snomed concept combined with the causing drug coded with CNK or ATC.

Medical problems related to drug use:

Snomed Code Snomed Name
62014003 adverse reaction to drug
59037007 drug intolerance
416098002 drug allergy
86062001 contact dermatitis due to drugs AND/OR medicine
59274003 intentional drug overdose
59369008 accidental drug overdose
274228002 drug overdose - suicide
55680006 drug overdose
363101005 drug withdrawal
361055000 misuses drugs
191816009 drug dependence
431307001 intentional poisoning by drug
269688005 accidental poisoning by drugs, medicines and biologicals

All pre-coordinated concepts with 'is a' relationship will be eliminated and will be recorded through a post-coordination with the authentic source of medication in Belgium.

7.2. Substance-related problems

The following pre-coordinated concepts are replaced with post-coordination of the primary concept

40275004 contact dermatitis
238575004 allergic contact dermatitis
72431002 accidental poisoning
219186006 assault by poisoning
75478009 poisoning (75478009 toxic effect)
271982007 intentional self poisoning
281647001 adverse reaction

418757007 accidental ingestion of potentially harmful entity
2776000 delirium

7.3. Events

The pre-coordinated concepts which are common or which are fully defined (IsPrimitive=0) are accepted and translated. Otherwise the concepts is eliminated and replaced by post-coordination.

Snomed Concept	Post-coordination Rule
37169002 collision	< 303069001 person in the transport environment , 246075003 causative agent = < 36030000 transport vehicle , < 285202004 community environment
1912002 fall	< 285202004 community environment 272488003 , from-structure = (< 272179000 domestic, office and garden artefact OR < 80519002 hospital furniture)
215165000 pedal cycle accident involving fall from pedal cycle	< 285202004 community environment
418975000 bite of animal	246075003 causative agent = < 387961004 Kingdom Animalia , 363698007 finding site = < 400199006 structure of skin and/or surface epithelium
52684005 assault	246075003 causative agent = (< 105590001 substance OR < 78621006 physical force OR < 312201009 instrument of aggression)
24932003 exposure to exposure	246075003 causative agent = (105590001 substance OR 78621006 physical force)
255714004 accidental exposure	246075003 causative agent = (105590001 substance OR 78621006 physical force)

7.4. Varia

Concepts	Rule	Comment
'female' 'male'	postco 'gender'	

8. Translation

In order to speed the translation and to enhance consistency, some translations will be done by combination of translated components.

To this purpose anatomical sites are translated in NL and Fr and are combined with the primary concepts.

En Label	Nl label	Fr label
Infection due to	infectie door	Infection à
Benign neoplasm of	benigne tumor	tumeur bénigne
Neoplasm of	tumor van	tumeur
malignant melanoma	maligne melanoom	mélanome malin
Melanoma in situ	melanoma in situ	mélanome in situ
Primary malignant neoplasm of	maligne neoplasma	tumeur maligne
Malignant neoplasm of	maligne neoplasma	tumeur maligne
Malignant carcinoma	maligne neoplasma	tumeur maligne
Malignant tumor	maligne neoplasma	tumeur maligne
Secondary malignant neoplasm	metastase	tumeur secondaire
Carcinoma in situ	carcinoma in situ	carcinome in situ
Injury	traumatisch letsel	lésion traumatique
No range	volledige blokkering van de	blockage complet
Decreased range	Beperking van de	perte de
Abscess of	abces	abcès de
Congenital absence of	congenitale afwezigheid	absence congénitale
Contusion of	contusie	contusion
Laceration	laceratie	lacération
Fracture	fractuur	fracture de
Malignant melanoma	maligne melanoom	mélanome malin
Burn	brandwond	brûlure
Open fracture	open fractuur	fracture ouverte
Cellulitis	cellulitis	cellulite
Open wound	open wond	plaie ouverte
Rupture	ruptuur	rupture
Spinocellular carcinoma	spinocellulair carcinoom	carcinome épidermoïde
Hematoma	hematoma	hématome
Puncture wound	puntvormige wond	plaie punctiforme
Mass	massa	masse
Needle stick injury	prikwond met naald	plaie par ponction
Foreign body	vreemd lichaam	corps étranger
Edema	oedeem	oedème
Wood splinter	houtsplinter in	écharde de bois
Stab wound	steekwond	plaie par arme blanche
Bite	bijt wond	morsure
Cellulitis en abscess	cellulitis en abces	cellulite et abcès
Dog bite	hondenbeet	morsure
Third degree burn	brandwond van de derde graad	brûlure profonde au troisième degré

En Label	Nl label	Fr label
Lipoma	lipoma	lipome
Sarcoma	sarcoma	sarcome
Abrasion	schaafwond	abrasion
Second degree burn	brandwond van de tweede graad	brûlure au deuxième degré
Blister of scalp with infection	geïnfecteerde blaar	phlyctène
Pain in	pijn in	douleur
congenital dislocation	congenitale luxatie	luxation congénitale
Fracture dislocation	fractuur en luxatie	fracture et luxation
Pathological dislocation	pathologische luxatie	luxation pathologique
Fracture subluxation	fractuur en subluxatie	fracture en subluxation
Swelling	zwellling	gonflement
Adenocarcinoma	adenocarcinoom	adénocarcinome
Perforation	perforatie	perforation
Basal cell carcinoma	basocellulair huidcarcinoom	épithéliome basocellulaire
Luxation	luxatie	luxation
Acute osteomyelitis	acute osteomyelitis	osteomyélite aiguë
Hemarthrosis	haemarthrose	hémarthrose
Osteomyelitis	osteomyelitis	ostéomyélite
Pathological fracture	pathologische fractuur	fracture pathologique
Crush injury	crush letsel	écrasement
Insect bite	insectenbeet	piqûre d'insecte
Chronic osteomyelitis	chronische osteomyelitis	osteomyélite chronique
Traumatic rupture	traumatische ruptuur	rupture traumatique
Diffuse non-Hodgkin's lymphoma	diffuus non-Hodgkin lymfoom	lymphome non-Hodgkin diffus
Mycosis fungoides	mycosis fungoides	granuloma fungoïdes
Diffuse non-Hodgkin's lymphoma	non-Hodgkin lymfoom	lymphome non-Hodgkin
Serosal tear	scheur van het slijmvlies	déchirure de la muqueuse
Splinter	Splinter	écharde
Traumatic amputation	traumatische amputatie	amputation traumatique
Stress fracture	stressfractuur	fracture de stress
Penetrating injury	penetrerend letsel	plaie pénétrante
Tear	scheur	déchirure
Squamous cell carcinoma	spinocellulaire carcinoom	carcinome spinocellulaire
Tenderness	tenderness	sensibilité à la palpation
Infected insect bite	geïnfecteerde insectenbeet	piqûre d'insecte infectée
Perforated diverticulum	geperforeerd divertikel	diverticule perforé
Hodgkin's granuloma	Hodgkin granuloom	Hodgkin granuloom

9. Work Flow

9.1. Diagnoses 15.700 First run

9.1.1. Selection concepts First run

All concepts will be evaluated by two physicians: one French and one Dutch speaking. The evaluation of the concept is based on the English label.

When a Concept is considered valid the field [Concept ok?] is marked with 'x'.

When the concept is considered obsolete the field [Concept ok?] is marked with 'd' (to be deleted, = to be retired). Fill out the field [Rule] and/or the field [Comment].

When the field [Concept ok?] is marked with 'r' the concept is to be reviewed. Fill out the field [Comment]. Quote to be avoided.

When a concept is considered to be a synonym of an existing term, the field [Concept ok?] is marked with 's'. Put the Snomed code (CliniClue) of the preferred Snomed concept in the field [Rule].

If a concept is to be added the field [Concept ok?] is marked with 'a', ConceptId (Snomed CT number) is entered and the translation proposed. Since all possible Snomed CT concepts will be presented in the second work package, adding concepts in the first work package is optional.

If a concept is acceptable but needs further refinement with attributes:
[Concept ok?] = postco.
[Rule]: name of attribute= allowable values.

Example:

'verruca vulgaris '

[Concept ok] = 'postco'

[Rule] = 363698007 | finding site | =
400199006 | structure of skin and/or surface epithelium |

9.1.2. Translation First run

If a concept is accepted to be valid, the French and Dutch label will be validated. If the initial label coming from the merging project is accepted, no new proposal is done. If the Fr or NI label is absent or can be improved, a new label is proposed in Fr_Proposed / NI_Proposed.

For all 15.700 concepts a Dutch label is present from the merging project between the 3BT thesaurus and the CMV UZB. A terminologist selected in this merging project (2009-2010) the preferred term for a given Snomed concept either from the 3BT thesaurus either from the CMV UZB.

In this project the Dutch terminologist has to check if the proposed label represents the Snomed CT concept in an exact way and if it is conform with general translation guidelines. If not, a new Dutch label is proposed.

A French label is available from 3BT for 9.734 concepts and from the French Canadian Snomed 3.5 for 8.556 concepts. 2.811 concepts don't have any Fr translation available.

The French terminologist can choose a label or can propose a new label.

9.2. Diagnoses 15.700 Second run

9.2.1. Run 2 Fr

With the help of a web based terminology management tool, 2.109 translations were standardised in an automatic way based on the parsing and replacement of words on the following rules:
[concept ok] of these concepts were reviewed manually by the Fr terminologists.

On 15/3/2012 [concept ok] was put to 'd' for 991 concepts based on some rules coming from the Methodology.doc.

The other 12.000 concepts were not reviewed and will be the subject of manual validation in Run3.

src_rule	CountOfsrc_rule
with	158
closed fracture	78
acquired	74
due to	66
nonvenomous	59
without	55
and	50
complication of	46
neoplasm of uncertain behavior	46
without complication	40
perinatal	36
secondary	33
non	20
in pregnancy	19
postoperative	17
during pregnancy	16
postpartum	13
puerperal	13
old	12
resulting	12
present	12
not	8
in the puerperium	6
spirou	6
or	6
with complication	5
continuous	4
examination	3

src_rule	CountOfsrc_rule
Overlapping malignant neoplasm of	2
traumatic injury	2
Nonruptured	1
amputated through elbow	1

With the help of a web based terminology management tool, 2.109 Fr translations were standardised in an automatic way based on parsing and replacement of words on the following rules:

English label	French label
Aplastic	aplastique
boil, furoncle, carbuncle	furoncle
cleft labial, cleft of lip	fente labiale
Condylar	du condyle
Degeneration	dégénérescence
Disease	maladie
Disorder	affection
Dysfunction	dysfonctionnement de
Jaw	mâchoire
Ombilicus	ombilic
Pelvis	bassin
Penis	pénis
Pneumococcal	à pneumocoques
punched out	à l'emporte pièce
rheumatoid arthritis	polyarthrite rhumatoïde
Scapula	omoplate
Submandibular	sous-mandibulaire
secondary malign neoplasm	tumeur maligne secondaire
primary malign neoplasm	tumeur maligne
Suppurative	suppurée
thoracic vertebra, dorsal vertebra	vertèbre thoracique
Axillary	creux axillaire
pineal gland	glande épiphysaire

9.2.2. Run 2 NI

After the first run all concepts and translations of Run 2 are presented to a second terminologist of the same language with the first evaluation visible in the work file.

The terminologist can make a new proposal if he/she disagrees with the previous selection [concept ok] and/or translation coming from the first work package.

At the end rules for elimination and automatic translation were applied and took priority over the manual evaluation. The concepts will be reviewed a third time manually in the third run3.

9.3. *Snomed Extension Run 3*

The Run 3 includes all clinical findings and events of Snomed CT accounting for 85.000 concepts. Of these concepts 15.700 concepts have been covered by Run 1 and 2.

Before starting Run 3, all the rules for elimination as documented in the Methodology.docx will be run in an automatic way. For these items [concept ok? run3] will be prefilled with 'd' and with the rule in the field [rule run3].

In the working files the evaluation [concept ok? Run 2] and [rule Run 2] will be presented to the terminologist in Run3. The concepts of run 2 will be switched to another terminologist. When no automatic rule was applied, the result of Run 2 will be prefilled in the fields [concept ok? run3] and [rule run3].

When the concept is disqualified the field [Concept ok?] is marked with 'd' (to be deleted) and the field [Rule] is to be filled out with rule on which the elimination is based and which needs to be documented in the Methodology.docx. The field [Comment] allows free comments.

If a concept is to be added the field [Concept ok?] is marked with 'a'
The concept is defined in [rule] with the closest Snomed definition.
A request for addition of the concept will be submitted to the IHTSDO at the end of the project.
The temporary Snomed ConceptId in the Belgian Namespace will be entered and the translation proposed.

At the end of the project all selected components will be translated.

9.4. *Reconciliation*

After the third run the last evaluations will be the basis on the final selection:
When both physicians quoted 'x' or 'd' similarly, the selection/elimination of the concept is automatically confirmed and entered in the final terminology with the field [Concept ok?]= 'x' or 'd'.

All disagreements after the third run are discussed in order to come to a consensus.
The items where a consensus seems difficult will be presented to all terminologists. The evaluation of the majority will be followed.

10. Data management

10.1. *Database*

The Reference terminology database is stored on an eHealth server.
Every month an export of the last version will stored on BeConnected with access to all terminologists.

10.1.1. DB Diagnoses 15.700 First run

The two working tables (Concepts NI, Concepts Fr) will be consolidated per language in a MS Access 'DB terminology 15700.mdb' per terminologist.mdb with structure:

ICD_10_Code
Snomed CT number
Fully specified name
Concept ok?
Comment
NL_Clinical_Label
NL_Proposed
FR_Clinical_Label
FR_Canada
Fr_Proposed
Coder

If the concept is considered ok: [concept ok] = 'x'; obsolete [concept ok] = 'd' (to be deleted) ; 'r' (to be reviewed) ; 's' (synonym); 'a' to be added.

If the concept is not ok, the reason is given in 'Comment'.

If the translation is not ok, a proposal is defined in the field 'FR_Proposed' or 'NL_Proposed'

10.1.2. DB Diagnoses 15.700 Second run

The two working tables (Concepts NI, Concepts Fr) will be consolidated per language in a MS Access 'DB terminology 15700 second run.mdb' per terminologist.mdb with structure:

Field/Column	Situation at start Run2	Action
ICD_10_Code		
Snomed CT number		
EN_Clinical_Label	Label Snomed	
Concept OK?	Evaluation second run	To be coded
Comment	Evaluation second run	To be coded
Nl_proposed	Evaluation second run	Entered if new translation or change proposed
Fr_proposed	Evaluation second run	Entered if new translation or change proposed
Specific	Result first run	Can be updated in second run
Nl Concept ok?	Result first run	For information
Fr Concept ok?	Result first run	For information
Nl_Belgium	Result first run	For information
Fr_Belgium	Result first run	For information
Nl Comment	Result first run	For information
Fr Comment	Result first run	For information
Nl coder	Result first run	For information
Fr coder	Result first run	For information
Coder	Terminologist second run	Default

10.1.3. DB Extension Run 3

The two working tables second run (Concepts NI, Concepts Fr) will be consolidated in a MS Access 'DB terminology Extension.mdb' per terminologist.mdb

Working files will be presented to the NI terminologists with the following fields/columns:

Field/Column	Situation at start Run3	Action
ICD-10-index	The name Index is given because the ICD-10 code is approximate and based on the Snomed cross map 2004	For information and link to WHO translation
ICD-9-CM	Snomed cross map 2011	For information.
Snomed CT number	Snomed concept id	For information.
En_Clinical_Label	Fully specified name of Snomed	For information.
NI_Concept OK? Run3	Selection concept by NI terminologist Run3	To be coded
NI_Rule Run3	Rule which is used if the concept is not accepted 'd'. Rule needs to be documented in Methodology.docx. The field is prefilled with rules which are applied automatically after Run2. If there is no automatic rule, the result of NI_Rule Run2 is prefilled, if existing.	May not be blank if [concept ok]='d'. Validation and eventual correction of prefilled rule.
NI_Comment Run3	Blank at start	Entry of any comment in free text. Is optional.
NI_proposed Run3	Blank at start	Entered if first translation or change of translation proposed
Automatic Rule	Rule documented in Methodology.docx which is applicable	For information
NI_Concept ok? Run2	Result second run	For information
NI_Clinical_Label Run2	NI label after second run	For information
NI_Comment Run2	Result second run	For information
Coder NI run3	Coder run 3. Is prefilled. The coder will be different from the coder of the same concept in run 2.	For information
Coder NI run2	Result second run	For information
NI_DiagnoseThesaurus	Term used in the Diagnosis thesaurus of the Netherlands	For information
ICD10-Nederland	Term ICD-10 code	Term validated by the WHO collaborating center for the given ICD-10 code
Fr_Canada	French translation of Snomed concept by Canada (Roger Côté)	Term validated by the WHO collaborating center for the given ICD-10 code
IsPrimitive	When the Snomed concept is fully defined (definition of all components) IsPrimitive='0'	For information. Fully defined concepts should not be replaced by a post-coordination rule unless a specific rule exists in the Methodology.docx.

10.2. Work files

The terms to be evaluated are delivered in xls to the terminologists with the fieldnames:

Files are splitted in parts of ± 1.000 records per terminologist = 'coder'. There mustn't be overlap between files and definitely not any gaps.

Files are sorted on ICD-10-WHO. When ICD-10 is missing, the closest ICD-10 will be estimated based on the ICD-9-CM/ICD-10 and SnomedId/ICD-10 cross map.

Working files are named with [inversed date of sending] 'CMV' [working package] [range of records or range of ICD-10 codes] [initials coder] [status]

[working package] can be 'first run' 'second run' 'extension'
[status] can be 'new' 'done'

Example

'110309 CMV MDJ first run new'

'110309 CMV MDJ done'

10.3. Import & Update

Import records with 'coder'

Replace [Concept ok], [Comment] and [Fr_Proposed] or [NI_Proposed]

Select 'a': and Add record

11. Mandatory reading

The document 'IHTSDO, 2008: Guidelines for Translation of SNOMED CT.' is mandatory for all terminologists.

SNOMED CT Compositional Grammar Chapter B.3 of the document:

<http://dwidgis02.salud.gob.mx/forohl7/html/infrastructure/terminfo/terminfo.htm#TerminfoAppendRe fsGrammar>

Section 6.2.2.3 (Attributes to define 'Clinical Findings') and 6.2.2.10 (Attributes to define 'Events') of the SNOMED_CT_Technical Implementation Guide_Current-en-US_INT_20120131.pdf

12. References

Benson Tim (2010): Principles of Health Interoperability. HL7 and Snomed. Health Informatics, 2010, Springer-Verlag

Bodenreider, O., Smith, B., Burgun, A. (2004). The Ontology-Epistemology Divide: A Case Study in Medical Terminology. In: Achille Varzi and Laure Vieu (eds.), Proceedings of FOIS 2004, International Conference on Formal Ontology and Information Systems, Turin, 4-6 November 2004 (http://ontology.buffalo.edu/medo/Onto_Epist.pdf).

IHTSDO, 2008: Guidelines for Translation of SNOMED CT.

Hoy Asta (2006): 'Coming To Terms With Snomed Ct® Terms: Linguistic And Terminological Issues Related To The Translation Into Danish'. Terminology Science and Research, dec. 2006

Spackman, K.A., Dionne, R., Mays, E., Weis, J. (2002). Role grouping as an extension to the description logic of Ontylog, motivated by concept modeling in SNOMED, Proc AMIA Symp., 712-6.

Spackman, K.A., Reynoso, G. (2004). Examining SNOMED from the perspective of formal ontological principles: Some preliminary analysis and observations. In: Hahn U (ed), Proceedings of the KR 2004 Workshop on Formal Biomedical Knowledge Representation. Whistler, BC, Canada, 72-80.