

# SNOMED CT July 2019 International Edition - SNOMED International Release notes

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## 1. Introduction

## **1.1. Background**

SNOMED CT terminology provides a common language that enables a consistent way of indexing, storing, retrieving, and aggregating clinical data across specialties and sites of care.

SNOMED International maintains the SNOMED CT technical design, the content architecture, the SNOMED CT content (includes the concepts table, the descriptions table, the relationships table, a history table, and ICD mappings), and related technical documentation.

## **1.2. Purpose**

This document provides a summarized description of the content changes included in the July 2019 release of SNOMED Clinical Terms® (SCT) International Release.

It also includes technical notes detailing the known issues which have been identified and agreed to be released. These are content or technical issues where the root cause is understood, and the fix has been discussed and agreed, but has yet to be implemented.

The SNOMED International Release Notes are available alongside the July 2019 International Edition release.

## **1.3. Scope**

This document is written for the purpose described above and is not intended to provide details of the technical specifications for SNOMED CT or encompass every change made during the release.

## **1.4. Audience**

The audience includes National Release Centers, WHO-FIC release centers, vendors of electronic health records, terminology developers and managers who wish to have an understanding of changes that have been incorporated into the July 2019 International Edition release.

## **2. Content Development Activity**

## 2.1. Summary

Continuous quality improvement and enhancement of existing content is an ongoing process by SNOMED International for every release. The July 2019 International Release has seen a continuation of the work driven by contributions from: Kaiser Permanente Convergent Medical Terminology (CMT), Global Medical Device Nomenclature Agency (GMDNA), Orphanet and other domain specific collaborations as well as requests received via the Content Request System (CRS). Additionally quality improvement activities are in progress for new and enhanced content through project driven initiatives which are also summarized below. Also included as work items for every release are various updates to SNOMED CT derived maps such as ICD-10 and ICD-O and details are also included in these release notes. Information about editorial decisions may be found in the SNOMED CT Editorial Guide, mapping guidance for ICD-10 can be found at this link <https://confluence.ihtsdotools.org/display/DOCICD10>.

### Update: WAS\_A

Inactivation reason of LIMITED/WAS\_A is not allowed for any new content inactivations after the July 2018 release. The WAS\_A association refset has not been updated thereafter.

At the Editorial Advisory Group meeting in April 2019, agreement was reached to discontinue the maintenance of WAS\_A relationships when inactivating concepts that have a historical association to an inactive concept. When changes are made to a historical relationship for a concept that was previously inactivated using WAS\_A, effort will be made to assign a new historical relationship that facilitates traceability of the concept (e.g. DUPLICATE or AMBIGUOUS) as opposed to NON-CONFORMANCE TO EDITORIAL POLICY.

Existing WAS\_A relationships will be inactivated in a future release once a plan for batch reassignment of historical relationships has been developed. Until then, SNOMED International will not continue to use or maintain WAS\_A relationships.

## 3. Content Quality Improvement

SCT Statistics	
Domain	#New concepts
SNOMED CT Concept (SNOMED RT+CTV3)	4411
Body structure (body structure)	451
Clinical finding (finding)	1206
Event (event)	6
Observable entity (observable entity)	32
Organism (organism)	141
Pharmaceutical / biologic product (product)	1929
Physical object (physical object)	44
Procedure (procedure)	215
Qualifier value (qualifier value)	149
Record artifact (record artifact)	7
SNOMED CT Model Component (metadata)	13
Situation with explicit context (situation)	86
Social context (social concept)	1
Specimen (specimen)	4
Staging and scales (staging scale)	2
Substance (substance)	125

<b>SCT Improvement Statistics</b>	
<b>Existing Concepts</b>	<b>#Changes</b>
Total number of changes	44638
Change to stated concept definition	30254
Change to inferred concept definition	25842
Change in concept definition status from Primitive to Sufficiently Defined	2400
Description change	2461
Inactivated concepts	3142
Inactivated descriptions	1700
Reactivated concepts	13

## 3.1. Anatomy

New anatomy concepts: 451

The new anatomy concept model implemented the enhanced Description Logic features, e.g. reflexive and transitive properties, additional axioms, for consistent logical modeling. The inferred IS A relationships from the OWL anatomy ontology have been reviewed and the changes have been implemented in the production. The potential impact to other hierarchies, such as disorders, procedures, observables, situations etc are also reviewed as part of the project.

The subject area for revision of IS A relationships will be determined and updated in the following confluence page <https://confluence.ihtsdotools.org/display/IAP/Revision+of+IS-A+relationships+for+anatomy> (*Please note, you may have to register for Confluence user account in order to access this project*).

The initial review was completed for over 12,000 hierarchical relationships that are different between the production release and new anatomy model for body structures. For this release, the focus for the Anatomy project is quality improvement for the cardiovascular, digestive and genitourinary systems. Review of the remaining systems is planned for the 2020 January release.

Changes to hierarchical relationships:

- Cardiovascular system: 1363
- Digestive system: 906
- Genitourinary system: 510

Reviewed potential impact to other hierarchies e.g. disorder, procedure and addressed most issues.

- Cardiovascular system: over 8600
- Digestive system: over 7200
- Genitourinary system: over 6800

### 3.1.1. Quality Improvement in the Body Structure Hierarchy

A branch of a specified artery is not subordinate to its origin but has an IS\_A relationship to a more regional artery. Any relationships that did not fulfil this rule have been corrected.

A tributary of a specified vein is not subordinate to the vein it drains in to, but has an IS\_A relationship to a regional vein that covers the entire anatomical boundaries of every tributary of that vein. Any relationships that did not fulfil this rule have been corrected.

The vascular structure of an organ is composed of vessels that lie within and are part of the organ and the vessels that lie outside which supply it. So the kidney has glomerular arterioles within the kidney and a renal artery and renal vein that supply and drain the kidney. These relationships have been implemented for most organs and the remaining organs e.g. liver, stomach will be rationalized in the subsequent release.

Distinction has been made between the abdominopelvic structure and its constituent components: structures of the abdomen proper and those subsumed by pelvic structure. In general clinical concepts using the word 'abdominal' usually mean 'abdominopelvic' but in some specific circumstances a distinction is required; for example the uterus is located in the true pelvis (pelvis major) and not within the abdomen proper.

Skin appendage structures have been placed under skin structure.

Revision made to digital nerves of toe and its subconcepts.

Updates to free margin of eyelid and its subconcepts.

New additions of lumen concepts for the gastrointestinal tract and joint region concepts to support work for the Quality Initiative.

Updated content for the internal part of the mouth region.

Revision of subconcepts of lateral half of face.

Updated and validated release file for the lateralizable body structure reference set.

Updated and validated release files for the SEP refsets.

## 3.2. Clinical finding

New concepts for clinical findings and disorders: 1206

### Known Content Issue July 2019 Release

Approximately 149 text definitions are missing either a US or GB spelling variation. These are all legacy issues that will be rectified in the January 2020 release.

A small set of disorder concepts have been identified with descendants that have a semantic tag of clinical finding. A further small set of concepts have been identified that have a semantic tag of disorder but are not descendants of 64572001[Disease (disorder)]. These concepts are all legacy issues that will be rectified in the January 2020 release.

Release validation rules have been enhanced to prevent recurrence of legacy issues for future content additions.

New content additions include:

- Abnormal uterine bleeding = 8 new concepts
- Abscess = 17 new concepts
- Aneurysm = 12 new concepts
- Benign neoplasm = 22 concepts
- Closed fracture = 47 concepts
- Contracture = 14 concepts
- Open fracture = 15 new concepts

### 3.2.1. Quality Initiative

The Quality Initiative (QI) project is the implementation of the Quality Strategy. After a successful pilot project for the July 2018 release the next stage has been implemented for the January 2019 and July 2019 release.

Quality improvement tasks were deployed to improve internal structural consistency and ensure compliance with editorial policy related to the stated modeling of content. Additionally, correction or addition of defining relationships was carried out to accurately reflect current clinical knowledge and ensure the semantic reliability of descriptions associated with a concept.

Total count of changes for the QI project:

- Stated: A total of 25508 concepts had changes made to the Stated relationships in their models.
- Inferred: A total of 14887 concepts affected by inferred changes.

As noted in the January 2019 release notes, as a result of changes made during the QI project, there were 2 concepts which had the same preferred term:

- 781488002 |Abrasion of foot (finding) and 211402004 |Abrasion of foot (disorder)
- 782201009 |Abrasion (finding) and 399963005 |Abrasion (disorder)|

This has been rectified as part the QI project for the July 2019 release.

A bulk operation has been run against 17308 concepts in the << 64572001 |Disease (disorder)| hierarchy which has copied any inferred attributes into the stated view where they did not already exist. In addition where the Proximal Primitive Parent could be correctly calculated to be 64572001 |Disease (disorder)| the existing immediate fully defined parents have been inactivated and replaced with Disease. This process brings these concepts into line with SNOMED International's Editorial Policy of using a Proximal Primitive Parent where all appropriate attributes are stated and classification ensures that the correct parents are assigned in the inferred view. This is considered to be an efficient authoring style as the hierarchy is maintained mostly automatically by the classifier, rather than requiring authors to manually curate parent child relationships within hierarchies.

#### Clinical Finding Subhierarchies remodeled to the Proximal Primitive Parent

Abrasion (disorder)	Fistula (disorder)
Abscess (disorder)	Foreign body (disorder)
Administrative statuses (finding)	Fracture of bone (disorder)
Allergy to Substance	Hernia of abdominal cavity (disorder)
Aneurysm (disorder)	Infectious disease (disorder)

Arthritis (disorder)	Laceration - injury (disorder)
Bite - wound (disorder)	Loose body in joint (disorder)
Burn (disorder)	Mycosis (disorder)
Carcinoma in situ (disorder)	Neoplasm of bone (disorder)
Cataract (disorder)	Open wound (disorder)
Chronic inflammatory disorder (disorder)	Protozoan infection (disorder)
Closed wound (disorder)	Sexually transmitted infectious disease (disorder)
Contracture of joint (disorder)	Ulcer (disorder)
Cyst (disorder)	Viral disease (disorder)
Disease caused by parasite (disorder)	Wound (disorder)
Erythema (finding)	

### 3.2.2. Content Tracker Project Updates

Work **continues** on the following Content Project:

- IHTSDO- 393 Diabetes Complications: The Diabetes Project Group has begun its work on reviewing the current SNOMED CT Diabetes Mellitus disorder concepts. The group is small but is truly international and each member is currently seeking to engage with diabetes specialists within their geographical zone in order to ensure international interoperability within this domain.

Work **completed** on the following Content Projects:

- IHTSDO-963 Review hierarchy 84229001|Fatigue (finding) and subtypes.
- IHTSDO-1057 Review hierarchy for 276206000|Superficial mycosis (disorder)|.
- IHTSDO-540 The intended meaning of Fracture of <spinal structure> with cord <lesion>.
- IHTSDO-991 Review of puncture and penetrating wound relationship.
- IHTSDO-471 Review concept model: Acne.
- IHTSDO-244 Review hierarchy: 362998000|Branchial cleft anomaly (disorder)

### 3.2.3. Other Areas of Quality Improvement in the Clinical Finding Hierarchy

Revision of 7890003 |Contracture of joint (disorder)| - Contracture of joint and its subtypes have been remodeled to more precisely represent the anatomical structures associated with contracture. Joint contractures are due to abnormal shortening of the soft tissues surrounding a joint as opposed to an abnormal morphology of the bony structure of a joint, so the finding site has been changed to "Structure of X joint region". This has resulted in the removal of the previously inferred parent of "Arthropathy" and replaced by "Disorder of joint region" and "Finding of joint movement".

Revision of 298180004 |Finding of range of joint movement (finding) - The concepts under the subhierarchy 298180004 |Finding of range of joint movement (finding)| are being remodeled to represent the finding site of <<785818007 |Structure of joint region (body structure)| instead of <<39352004 |Joint structure (body structure)|. Range of movement of a joint region can be impacted by both bone and soft tissues, therefore the use of 39352004 |Joint structure (body structure)| was too restrictive and caused issues in other areas of the terminology. These changes will be made over the course of two releases due to the number of affected concepts.

Revision of Schwannoma - All concepts with FSN containing "neurolemmoma" have been replaced with Schwannoma with neurolemmoma retained as a description. 189948006 |Schwannoma (disorder)| has been made active and modeled with associated morphology 985004 |Schwannoma (morphologic abnormality)|.

Revision of Peritoneal eosinophilia - remodel of this area of content including addition of new content.

Fracture - Inactivation of 12 erroneous fracture disorder concepts referencing spinal cord lesions (or cauda equina lesions) of sacrum and/or coccyx where these structures do not exist.

Laboratory clinical finding - Inactivation of two ambiguous laboratory finding concepts and creation of two new replacement concepts.

80093006 |Enophthalmos (disorder)| and subtypes have been remodeled.

Revision of descriptions for dietary concepts - content review identified 76 concepts where the definition had been marked as a synonym, these descriptions have been modified from synonym to definition.

Revision of description for Caregiver vs. Carer - Descriptions for 109 concepts were modified to align with this pattern: FSN 'caregiver', preferred term 'caregiver', synonym 'carer'.

Review of the hierarchy with parent concept of 432119003 | Aneurysm (disorder). It was noted that there were 4 potential ways of expressing the presence of an aneurysm:

- Aneurysm of xxx artery



- Unruptured aneurysm of xxx artery
- Non-ruptured aneurysm of xxx artery
- Nonruptured aneurysm of xxx artery

The number of concepts using either unruptured, non-ruptured or nonruptured were 13/1/4 respectively. There are 97 'Aneurysm of xxx artery' concepts. A decision was taken to inactivate those concepts of the form 'unruptured/non-ruptured/nonruptured aneurysm of xxx artery' as duplicates and point to their 'aneurysm of xxx artery' equivalents where available and to create new concepts where they were not.

Inactivations were made to remove many classification-derived concepts in the disorder hierarchy concerning late effect or sequela of injuries. The naming was updated to comply with current editorial advice. Relationships were added when possible to improve the definition of the concepts. Concepts from the injuries subhierarchy were remodeled when applicable when associated with the sequela/late effect counterpart. Revisions will continue for the January 2020 release.

Review of medical eponyms with Nazi affiliations. Removed references to "Wegener's" and "Reiter's" from FSNs to support a request to minimize the use of medical eponyms with Nazi affiliations. The terms were retained as synonyms for searching. From the article: "Eponyms and the Nazi Era- Time to Remember and Time for Change."

As part of the removal of Nazi-related names, reactive arthritis was reviewed.

- Reactivated reactive arthritis, and modeled as a primitive, with a parent of 724606001 |Peripheral spondyloarthritis (disorder)| and *due to* infectious disease.
- Removed synonym of reactive arthritis from 239783001 |Post-infective arthritis (disorder)|.

**Notice: Planned changes for the 'Co-occurrent and due to' pattern:**

**During the implementation of the new Description Logic features a conflict was uncovered between the modeling of 'Co-occurrent and due to' and General Concept Inclusions (GCIs). This has resulted in the need to reconsider the modeling of "Co-occurrent and due' and update the Editorial Guide for this area.**

**The plan is to update the Editorial Guide and all concepts that are currently modeled as 'Co-occurrent and due to' starting from the July 2019 release.**

### 3.3. Convergent Medical Terminologies (CMT)

New CMT concepts: 702

The majority of these newly authored concepts are in scope for mapping to ICD-10 and from the following domains:

- CMT Ophthalmology: 285
- CMT Mixed Domains: 410
- CMT Musculoskeletal: 7

### 3.4. Procedure

New concepts for procedure hierarchy: 215

Diagnostic imaging - 72 requests were received for new imaging procedure concepts with various imaging modalities.

- Plain X-ray: 63 new concepts
- Magnetic resonance imaging: 3 new concepts
- Ultrasound: 5 new concepts.
- Computed tomography: 1 new concept

Addition of 11 new concepts for laparoscopic procedures including 6 laparoscopic pectopexy concepts.

### 3.4.1. Content Tracker Project Updates

Work **completed** on the following Content Projects:

- IHTSDO-1004 Review of skin grafting (procedure) hierarchy
- IHTSDO-673 Add concepts: Excisions of dermoid cysts

### 3.4.2. Other Areas of Quality Improvement in the Procedure Hierarchy

Colorectal excision -changes have been made in either modeling, description, or addition of over ten procedure hierarchy concepts concerning the excision/resection of colon and/or rectum, anal anastomosis, colostomy, and/or creation of intestinal pouch.

Evaluation procedure changes:

- Inactivations: 9 concepts
  - Inactivated 5 duplicate evaluation procedure concepts
  - Inactivated 2 ambiguous evaluation procedure concepts
  - Inactivated 1 erroneous procedure concept
  - Inactivated 1 non-human evaluation procedure concept and moved to veterinary extension
- Descriptions changes:
  - Improved FSNs of 3 evaluation procedure concepts
  - Updated descriptions on 2 evaluation procedure concepts

121278003 |Drug measurement (procedure)| has been inactivated for the July 2019 Release and descendant concepts have been updated accordingly (n150). Because exposure to the substance being measured may or may not be due to the substance being used in a medicinal product, the grouper was inactivated as Ambiguous with Possibly equivalent to relationship to 430925007 |Measurement of substance (procedure)|.

80 descendants of 784396007 |Graft of skin to skin (procedure)| were remodelled to fix issues identified in the previous 304040003|Skin grafting| sub-hierarchy. A consistent modeling plan with one role group was adopted and the FSN and PT terming pattern adapted to match "[skin graft material substance] to [skin structure]." Skin graft procedure concepts were updated and now use the same terming throughout. Subsumptions that were expected but previously did not exist have been achieved through the development of a sub-hierarchy 420934007 Graft of skin (substance) and 32 descendants specifically for use in these procedures. A Template is currently under development.

Created new and remodelled - Implantation and Insertion qualifier values and procedures:

- Inactivated: 71861002 |Implantation (procedure)| - replaced with new 782902008 |Implantation procedure (procedure)|; Retained as subtype of introduction for use with non-biological devices.
- Created new concept: 770651008 |Insertion procedure (procedure)|.
- Reactivated 129336009 |Implantation - action (qualifier value)| as subtype of 424832003 |Surgical introduction - action (qualifier value)|.
- Made 129337000 |Re-implantation - action (qualifier value)| a subtype.
- Made 129407005 |Grafting - action (qualifier value)| a subtype.
- Made 129406001 |Transplantation - action (qualifier value)| a subtype.

## 3.5. Collaboration/Harmonization Projects

### 3.5.1. Orphanet

As a result of collaboration with Orphanet (<http://www.orpha.net/consor/cgi-bin/index.php>), 306 new SNOMED CT concepts have been created to represent rare diseases in the disorder hierarchy. All of these concepts have been mapped to ICD-10.

### 3.5.2. Global Medical Device Nomenclature Agency (GMDNA)

31 new SNOMED CT concepts created and mapped in the Physical object hierarchy to support the GMDN collaboration agreement.

## 3.6. Event

New concepts added: 6

### 3.6.1. Areas of Quality Improvement in the Event Hierarchy

Sexual assault (event) - Definitions were added to some of the sexual assault concepts within the event hierarchy. Forcible sexual assault is sexual assault that involves force, threat of force, or injury. A new concept was added to distinguish sexual assault described as incapacitated when the victim is unable to give consent due to incapacitation. [Sexual assault and rape] was inactivated.

Spelling modified to correct error on 102412001 [Noise pollution (event)].

### 3.6.2. Content Tracker Project Update

Work **completed** on the following Content Project:

- IHTSDO-1071 - Inactivation of transport accidents; movement of all vehicle accidents to children of Transport accidents; Fully-defining some when possible and adding additional parents if appropriate.

## 3.7. Qualifier Value

New concepts added: 149

### 3.7.1. Areas of Quality Improvement in the Qualifier Value Hierarchy

Agencies and organizations (qualifier value) and subtypes moved to National extension 66 concepts inactivated.

## 3.8. Organism

New organism concepts added: 141

### 3.8.1. Areas of Quality Improvement in the Organism Hierarchy

- Changes made to the organism hierarchy as result of member requests:
  - Added 141 new organism concepts.
  - Updated FSN (and parent) for 266 concepts resulting from taxonomic names changes.

Clarification, simplification and correction of the top levels of the SNOMED CT Organism hierarchy to enhance accurate retrieval and aggregation of organism classes important for defining infectious disease and for laboratory findings for infectious disease:

- Upper levels of the organism hierarchy above the following three (they are at the level of "Organism" and the Domains Prokaryota and Eukaryota).
- Upper levels of the Kingdom Bacteria hierarchy.
- Upper levels of the Virus hierarchy.
- Upper levels of the Kingdom Fungi.

### 3.8.2. Content Tracker Project Update

Work **completed** on the following content project:

- IHTSDO-1003 Clarification, simplification and correction of the top levels of the SNOMED CT Organism hierarchy.

### 3.9. Pharmaceutical / biologic product

#### Drug model project

For further details on the planned changes in this area, please refer to the Drug Model Working Group Directory section.

*Please note, you may have to register for Confluence user account in order to access this project and the relevant links below.*

Changes for the 2019-July International Release	
<b>Concrete domain</b>	<ul style="list-style-type: none"> <li>• Early Visibility Notice submitted and Editorial Guide updated to provide advance notice of future changes.</li> </ul>
<b>Gap analysis</b>	<ul style="list-style-type: none"> <li>• Compiled list of content areas to be considered for prioritization and planning for future work.</li> </ul>
<b>Medicinal product hierarchy</b>	<ul style="list-style-type: none"> <li>• Resolved descendants of 770654000 [TEMPORARY parent for CDs that are not updated (product)]. <ul style="list-style-type: none"> <li>• Concepts that were not able to be mapped to dm+d but could be mapped to an RxNorm concept were reviewed and remodeled as sufficiently defined if possible (n1800). Concepts that could not be mapped to either dm+d or RxNorm concept or could not be sufficiently defined after mapping were inactivated (n900). 770654000 [TEMPORARY parent for CDs that are not updated (product)] was inactivated.</li> </ul> </li> <li>• Added new Medicinal product, Medicinal product form, or groupers based on disposition or structure as needed.</li> <li>• Refined the MRCM for 411116001 [Has manufactured dose form].</li> <li>• Editorial Guidelines updated and distributed.</li> </ul>
<b>National extension model</b>	<ul style="list-style-type: none"> <li>• Distributed the following notice re: requests for new concept model attributes for the national extension model. <ul style="list-style-type: none"> <li>• The submission of new attributes for concept model should follow the normal content request submission process via CRS. The request should provide sufficient information for business requirements and example for the proposed enhancement to concept model. It is important to demonstrate that the enhancement will be beneficial to most member countries and such benefits cannot be achieved by attribute in an individual extension concept model. The request should be submitted earlier to allow time for evaluation, deployment, and update of MRCM rules and Editorial Guide.</li> </ul> </li> <li>• Editorial Guidelines updated and distributed.</li> <li>• New attributes added (for use by national extension model but not for International Release). <ul style="list-style-type: none"> <li>• 784276002 [Count of clinical drug type (attribute)].</li> </ul> </li> </ul>
<b>Pharmaceutical dose form</b>	<ul style="list-style-type: none"> <li>• Editorial Guide for Pharmaceutical dose form and supporting hierarchies updated and distributed.</li> <li>• Resolved out of scope content in [Pharmaceutical dose form] hierarchy (n18).</li> <li>• Resolved out of scope content in [Basic dose form] hierarchy (n42).</li> <li>• Reviewed concepts in [Dose form intended site] hierarchy (n30) and updated as needed to conform to Editorial Guidelines.</li> <li>• Reviewed concepts in [Dose form by site prepared for] hierarchy (n20) and updated as needed to conform to Editorial Guidelines.</li> <li>• Added text definitions for existing concepts in [Dose form administration method], [Dose form release characteristic], [Dose form transformation], and [State of matter] hierarchies (n12).</li> </ul>

### **3.10. Veterinary Extension**

11 concepts were moved to the Veterinary Extension.

### **3.11. Social Context**

Inactivation of 186005001|Other ethnic non-mixed (NMO)| and children total of 44 concepts.

### **3.12. Situation with Explicit Context**

New concepts added : 86

- History of X = 56 new concepts
- Suspected foreign body - 4 new concepts were created in the situation hierarchy to account for the use case of a suspected foreign body.

### **3.13. Observable Entity**

New concepts were added: 32

### **3.14. Substances**

New concepts added: 125

### 3.14.1. Areas of Quality Improvement in the Substance Hierarchy

- Added new disposition concepts (and disposition groupers) as required.
- Added/updated "Is modification" attribute where applicable.
- Added new "has disposition" attribute where applicable.

Description update for the following rRNA, RNA and DNA of microorganism concepts all subtypes have been updated to match the terming conventions in the current Editorial Guidelines for the FSN, PT and synonyms, taking into account any changes required to both the case sensitivity and terming to reflect the current authoritative name of the relevant organism:

- Review of descendants of previous concept 118251005 Microbial ribosomal ribonucleic acid (substance) (now termed Ribosomal ribonucleic acid of microorganism).
- Review of descendants of previous concept 118249006 Microbial deoxyribonucleic acid (substance) (now termed Deoxyribonucleic acid of microorganism).
- Review of descendants of previous concept 118248003 Microbial ribonucleic acid (substance) (now termed Ribonucleic acid of microorganism).

The sub-hierarchy 420934007 Graft of skin (substance) descendants have been significantly revised and additional concepts created to comprehensively capture the origin, the nature of the skin graft material and thickness (full thickness, split thickness etc.) and text definitions have been included.

#### Release plans, Substance hierarchy

For further details on the planned changes in this area, please refer to the Substances project.

*Please note, you may have to register for Confluence user account in order to access this project and the relevant links above.*

## 4. Internal Quality Improvement

### 4.1. Logic Profile Enhancements

- The International Edition package will include both inactive Stated Relationships plus a *complete* OWL file from July 2019 effectiveTime onwards. In the July 2019 International Edition, this OWL file will contain only the history pertaining to OWL records that were included in earlier releases of the International Edition. No history of OWL records from the January 2019 optional "Demonstration" release package will be included in the July 2019 International Edition.
- We also plan to publish a separate optional package for the July 2019 International Edition, which will contain an OWL Delta file with all changes to OWL axioms since the optional OWL Demonstration package published in January 2019. The optional Demonstration package from January 2019 contained a complete set of OWL axioms, for both concept definitions and attribute properties.
- No support for Stated Relationships will be provided from this point onwards, however we will continue to include the inactivated Stated Relationships in future International Edition packages, until it is decided that this is no longer required.
- Anyone who requires stated concept definitions, who isn't yet ready to move forward with OWL will therefore remain on the January 2019 International Edition until they are ready to update to OWL with the July 2019 version onwards.

The inferred relationship file will maintain the same format and structure as in previous releases, and will now represent the Necessary Normal Form for distribution of relationships. Please read this document for detailed information: [2.5. Generating Necessary Normal Form Relationships from the OWL Refsets](#). Most users will benefit from the improvements in the inferred relationships without requiring changes to their existing systems.

#### Note about Concept model object attribute and Concept model data attribute concepts

The *Concept model object attribute* is the root of the Object Property hierarchy in the SNOMED OWL ontology but has also been made a subclass of *Concept model attribute* class. This is necessary in order to create the expected pragmatic link in the inferred form between the object attributes and the main concept hierarchy. The same is true for the Concept model data attribute which is the root of the Data Property hierarchy in the SNOMED OWL ontology.

#### The effectiveTime and OWL expression refset

In the July 2019 International Edition, it is the first release of the complete Snapshot of the OWLExpression refsets including all axioms converted from the stated relationships. The effectiveTime of the release (in this case '20190731') has been assigned to all records for converted axioms, as it was in the two published complete OWL Demonstration releases. As a result, users and developers need to be aware of the potential impact to the effectiveTime and content of the OWLExpression refset.

The decision was taken to re-version the concept definitions to 20190731 based on the established RF2 versioning principles, as (despite the stated relationships existing before this release) these OWLEExpression reference set members themselves were not published prior to 20190731.

As this decision has no impact on the inferred relationship file, this should not effect the majority of users. We will nonetheless provide additional support for those who need to identify the semantic changes in axioms, through the provision of an Optional release package.

In the July 2019 International Edition, the Delta file for the OWLEExpression refsets will include all axioms with effectiveTime '20190731'. This will include a mixture of axioms converted from stated relationships and new axioms. The Delta file will therefore show the differences between the OWLEExpression Snapshot files in the January 2019 and July 2019 releases (as per normal practice). As mentioned above, a separate Delta file, containing the concept modelling changes since the January 2019 optional axiom release will be provided as an Optional package for July 2019. Please note that rows in the Snapshot file of the OWLEExpression refset with an effectiveTime of '20190731' cannot be assumed to represent changes to the modelling of the associated concepts, because the majority of concept modelling will remain unchanged in this release. The Full file for the OWLEExpression refsets will not include the history of changes to stated relationships. This will instead be found in the Full file for Stated Relationships, which will continue to be included in the International Edition (despite all stated relationships being inactivated in the July 2019 release). However, the Full OWLEExpression file will include changes to axioms from both the January 2019 and the July 2018 release (when the partial OWL axiom refset and OWL ontology refsets were first released). Please note that this is different from the changes to stated relationships. If required, the complete history of changes to the stated relationships can be found by combining the Full stated relationship file, Full OWLEExpression file in the Production International Edition, and the OWLEExpression Delta file in the Optional release.

Users should carefully analyze any potential impact to their systems and make provisions for these changes urgently (if not already done). For more information, please contact SNOMED International at [support@snomed.org](mailto:support@snomed.org) with "OWL Axiom refset files implementation question" in the subject line.

A set of documentation has been developed to support the Logic Profile Enhancements:

- SNOMED DL Profile Enhancements - <https://docs.google.com/document/d/1tqNEA6S4fEF4fgj15OPabYA2E0VTz8epxvRRwczKizQ/edit?usp=sharing>
- SNOMED CT Logic Profile Specification - <http://snomed.org/lps>
- SNOMED CT OWL Guide (OWL Refsets specification) - <http://snomed.org/owl>
- SNOMED OWL Toolkit - <https://github.com/IHTSDO/snomed-owl-toolkit>
- Classifying SNOMED CT using the SNOMED OWL Toolkit - <https://youtu.be/-91egY9mJqA>
- Creating an OWL file containing SNOMED CT - [https://youtu.be/sfFbMMioA\\_4](https://youtu.be/sfFbMMioA_4)

## 4.2. Machine Readable Concept Model (MRCM)Changes

1 new MRCM rule and 3 updates to the existing MRCM in the MRCM refsets and authoring platform were made for the July 2019 release:

- New MRCM for the new attribute 784276002 |Count of clinical drug type (attribute)| and change domain for five attributes.
- Remove the redundant range 105455006|Donor for medical or surgical procedure (person)| for 370131001 |Recipient category (attribute)|.
- Expand the range of 255234002|After (attribute)| to include 272379006|Event (event)|.
- Update the MRCM for 411116001 |Has manufactured dose form|

Further details can be found here [MRCM changes in the July 2019 release](#) (*Please note, you may have to register for Confluence user account in order to access this project and the relevant links above*).

## 4.3. Improvement for the Representation of Role Groups

It is important to clearly indicate if an attribute is grouped or not because role grouping has impact to semantics and classification results. The majority of the Modeling Advisory Group members recommended explicit representation for role groups. There will be two key improvements for representation in the July 2019 release. The changes are demonstrated in the January 2019 Demo release package.

Firstly, role groups are explicitly stated and represented by the concept 609096000|Role group (attribute)| as an object property in the OWL axiom refset.

Secondly, for the inferred relationship file, role group 0 will be only applied to attributes that are not logically grouped, e.g. not a value of 609096000|Role group (attribute)| in an OWL axiom or grouped = 0 in the MRCM. This addresses the potential confusion whether an attribute is grouped or not in the role group 0.

The improvements will provide consistent representation for role groups in the OWL axioms, inferred relationship file, and diagramming of the concept model.

## 4.4. Concrete Domains and Numeric Representation

Currently, the Modeling Advisory Group is working on concrete domains and how they will be represented in the inferred RF2 relationship file format. The following is a note on the interim solution relating to concrete domain for the medicinal product model:

Numerics are represented by concepts in the Medicinal product concept model in SNOMED CT, which is an interim solution before the implementation of concrete domains to support data types, such as decimal, integer, string and date/time. The implementation of concrete domains depends on the OWL expression reference set and the update of inferred relationship file. The first complete OWL expression refset will be available in the July 2019 international release. It will take time to update the specification for the inferred relationship file and consult with the community of practice. When they are ready, strength in medicinal product model can be transformed to concrete domains. The transformation will be completed by technical changes without impact to classification results.

## 5. SNOMED CT derived products

### 5.1. ICD-10 map

The SNOMED CT to the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (© World Health Organisation 1994) 2016 Version map (SNOMED CT to ICD-10 Map) is included in the SNOMED CT International release as a Baseline. The SNOMED CT to ICD-10 Map was created to support the epidemiological, statistical and administrative reporting needs of SNOMED International member countries and WHO Collaborating Centres.

The SNOMED CT to ICD-10 Map is released in Release Format 2 (RF2) only. It is located in the file der2\_iisssccRefset\_ExtendedMapFull\_INT\_20190731.txt, which is in the Map folder under Refset, in each of the three RF2 Release Type folders.

The SNOMED CT to ICD-10 Map is released as Refset 447562003 |ICD-10 complex map reference set (foundation metadata concept)|.

#### 5.1.1. Content development activity summary

The map is a directed set of relationships from SNOMED CT source concepts to ICD-10 target classification codes. The SNOMED CT source domains for the MAP are limited to subtypes of 404684003 |clinical finding|, 272379006 |event| and 243796009 |situation with explicit context|. The target classification codes are ICD-10 2016 release.

#### 5.1.2. Mapped content for July 2019



The map provided for the July 2019 release has been updated, and now represents a complete map from SNOMED CT International release to ICD-10 2016 version.

- 1319 new concepts added

We would welcome feedback on any issues that users of the map may detect when using the map. Issues should be submitted via [mapping@sno-med.org](mailto:mapping@sno-med.org)

### 5.1.3. Technical Guide Exemplars

The Technical Guide Exemplars document has now been moved from the International Edition release package to a Confluence page. This page can be found as part of the ICD-10 Mapping Technical Guide (see Appendix B), which is hosted here: <http://snomed.org/icd10map>

## 5.2. ICD-O Map

There are 31 updates for the ICD-O Morphological abnormality map in July 2019 release.

**5.3. SNOMED CT to OWL conversion and classification** The repository containing the toolkit enabling simple SNOMED CT to OWL conversion and classification can be found here, including documentation on its use: <https://github.com/IHTSDO/snomed-owl-toolkit>

Please contact SNOMED International at [support@snomed.org](mailto:support@snomed.org) if you would like to provide any feedback on ways to extend and improve the new toolkit.

## 6. Technical notes

### 6.1. Known Issues

Known Issues are content or technical issues where the root cause is understood, and the resolution has been discussed and agreed but has yet to be implemented. This can be due to a number of reasons, from lack of capacity within the current editing cycle, to the risk of impact to the stability of SNOMED CT if the fix were to be deployed at that stage in the Product lifecycle.

For the Snomed CT July 2019 International edition, the following Known Issues were identified, and agreed to be resolved in future editing cycles:

Key	Summary	Description
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No issues found

## 6.2. Resolved Issues

Resolved issues are Known Issues which were not fixed as part of the previous release lifecycle, but which have now been resolved in the latest release - in this case the July 2019 International Edition. They can also be issues found during the Alpha and Beta testing of the current release, which were resolved before the final deployment of the associated Member release. Finally they can be issues which were reported or found during the testing phase, but which have been closed without any action taken.

The Resolved Issues for the Snomed CT July 2019 International edition can be found here:

key	summary	description	resolved
		 Jira server returned an error: [Ljava.lang.Object; @1573acaa <a href="#">View these issues in Jira</a>	

## 6.3. Technical updates

### 6.3.1. RF2 package format

For future reference, the RF2 package convention dictates that it contains all relevant files, regardless of whether or not there is content to be included in each particular release. Therefore, the package contains a mixture of files which contain both header rows and content data, and also files that are intentionally left blank (including only a header record). The reason that these files are not removed from the package is to draw a clear distinction between files that:

- have been deprecated (and therefore removed from the package completely), due to the content no longer being relevant to RF2 in this or future releases, and
- happen to contain no data in this particular release (and are therefore included in the package but left blank, with only a header record), but are still relevant to RF2, and could therefore potentially contain data in future releases.

This allows users to easily distinguish between files that have purposefully been removed or not, as otherwise if files in option 2 above were left out of the package it could be interpreted as an error, rather than an intentional lack of content in that release.

### 6.3.2. IMPORTANT CHANGE in the July 2019 International Edition

#### Replacement of the Stated Relationship files with the new OWL Expression refset files

*In the July 2019 release, the stated relationship file has been replaced by the OWL Axiom + OWL Ontology refset files, that include all logical definitions and other features specified in the SNOMED CT logic profile specification. The stated relationship file is included in the international release; however, all records have been inactivated as planned.*

#### Important note for users

*Users should carefully analyse any potential impact to their systems (upload routines, etc) and ensure that thorough testing is conducted, in order to prevent any issues when these changes come into effect in Production on 31st July 2019. Please contact SNOMED International at support@snomed.org with "OWL Axiom refset files implementation question" in the subject line.*

The inferred relationship file maintains the same format and structure, though it will no longer contain all necessary and sufficient conditions. The inferred relationship file is represented in Necessary Normal Form for distribution of relationships. It is a collection of all the necessary conditions and represents a subset of the full semantics from the 2018 July release and onwards. Most users will benefit from the improvements in the inferred relationships without requiring changes to their existing systems.

A set of documentations has been developed to support the Logic Profile Enhancements.

- SNOMED DL Profile Enhancements - <https://docs.google.com/document/d/1tqNEA6S4fEF4fgj15OPabYA2E0VTz8epxvRRwczKizQ/edit?usp=sharing>
- SNOMED CT Logic Profile Specification - <http://snomed.org/lps>
- SNOMED CT OWL Guide (OWL Refsets specification) - <http://snomed.org/owl>
- Necessary Normal Form for Inferred Relationships - <https://confluence.ihtsdotools.org/display/DOCOWL/2.5.+Generating+Necessary+Normal+Form+Relationships+from+the+OWL+Refsets>
- Snomed OWL Toolkit - <https://github.com/IHTSDO/snomed-owl-toolkit>
- Classifying SNOMED CT using the Snomed OWL Toolkit - <https://youtu.be/-91egY9mJqA>
- Creating an OWL file containing SNOMED CT - [https://youtu.be/sfFbMMioA\\_4](https://youtu.be/sfFbMMioA_4)

#### 6.3.3. Combination of two new refsets - OWLAxiom and OWLOntology

Please see section "2.3.1 Logic Profile Enhancements" above for full details of the reason behind the introduction of these new refsets. After the September 2018 Demonstration release, it was agreed to combine these two files into one "OWL Expression" file, which now contains both OWL Axiom + OWL Ontology refsets in the same file, in each section of the International Release package (Full, Snapshot and Delta):

- sct2\_sRefset\_OWLExpressionFull\_INT\_20190731.txt
- sct2\_sRefset\_OWLExpressionSnapshot\_INT\_20190731.txt
- sct2\_sRefset\_OWLExpressionDelta\_INT\_20190731.txt

The decision was taken to place the files in the "Terminology" folder in the release package (as opposed to the "Refset" folder), because these files are replacing the Stated relationship files, and therefore contain core content which needs to be included in the Terminology folder.

#### 6.3.4. Replacement of OWL conversion script with a link to the open source directory

In January 2017 the original OWL conversion script (a.k.a. the "Spackman OWL script") was removed from the International Edition package, and has since been published as a separate artefact alongside each Release.

Because this script does not recognize the two new OWL refsets (see section 3.3.2 of these Release Notes), the Terminology Release Advisory Group has determined that the script should no longer be distributed.

Going forward, Release Notes will now include a link to the new open source OWL conversion toolkit that can be found in the following repository (including documentation on its use):

<https://github.com/IHTSDO/snomed-owl-toolkit>

Please contact SNOMED International at support@snomed.org if you would like to provide any feedback on ways to extend and improve the new toolkit.

#### 6.3.5. Deprecation of the Technical Guide Exemplars document from the International Edition release package

The Terminology Release Advisory Group has confirmed that there should be no impact from removing this almost entirely static document from the International Edition release package, and hosting it instead in a Confluence Page. From the July 2018 International release then, we have deprecated this file (doc\_lcd10MapTechnicalGuideExemplars\_[date].xlsx) from the Release package, and instead provide a link in the Release Notes to the new Confluence Page.

#### 6.3.6. Early visibility of impending change in the January 2020 International edition

Please see the following page for details of all upcoming changes planned for January 2020 and beyond: [January 2020 Early Visibility Release Notices - Planned changes to upcoming SNOMED International Release packages.](#)

#### 6.3.7. Document links

All links provide information that is correct and current at the time of this Release. Updated versions may be available at a later date, but if so these will need to be requested from the relevant SNOMED International teams.

**NOTE:** To access any of the links in the pdf document, please visit the Release Notes @ <https://confluence.ihtsdotools.org/display/RMT/SNOMED+CT+July+2019+International+Edition+-+SNOMED+International+Release+notes>