



SNOMED CT Style Guide: Morphologic Abnormalities

Date 20080213
Version 1.01



Document Properties

Filename:	IHTSDO_Modeling_StyleGuide-Morphologies-20080213_v1-01
Title:	SNOMED CT Style Guide: Morphologic Abnormalities
Creating Author:	Kent Spackman
Subject*:	IHTSDO, Modeling, Style Guide for Morphology

* Subject should be filled in as 3 keywords. The first keyword should be a structural or organizational entity, e.g. "IHTSDO". The second keyword should be the process the document is related to, e.g. a "Meeting". The third keyword should be an object, e.g. an "Agenda".

Amendment History

Version	Date	Editor	Comments
1.01	20080213	Kent Spackman	Initial version released for comment

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Purpose of this document

This document describes editorial policies regarding the intended meanings of the morphologic abnormalities in SNOMED CT. It is intended to describe the editorial policies and previous decisions about meanings that are reflected in the current logic-based models. To the extent that there are inconsistencies between the stated policy in this document and the implemented logic-based definitions, these inconsistencies should be resolved through a consensus-based process. For short-term decision-making, the policies in this document should be adhered to. However, this is a working document, subject to change and revision. The intention is to support communication among those who are actively creating definitions, as well as those who are advising, consulting or providing feedback in a variety of capacities.

Status

The document is a working draft. Its contents have in part been derived from several historical sources, including the SNOMED RT Users Guide, Clinical Terms Version 3 documentation, minutes of the SNOMED CT Content Working Group, Concept Model Working Group, Kaiser CMT modelers meetings, and SNOMED Editorial Board / SNOMED International Standards Board meetings.



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1 Morphologic Abnormalities

The morphologic abnormality hierarchy is found two levels below the body structure hierarchy, with siblings “apoptosis” and “tissue repair”:

SNOMED CT Concept

body structure

morphologically altered structure

morphologically abnormal structure

apoptosis

tissue repair

The codes in the morphologic abnormality hierarchy represent classes of which the instances are all kinds of abnormal body structure.

1.1 Morphologic abnormalities vs. Findings

Codes from the morphologic abnormality hierarchy should not be used in place of codes from the clinical findings hierarchy, even though they appear to refer to similar clinical situations.

For example, *mass (morphologic abnormality)* [4147007] is not a finding, but *mass of body structure (finding)* [300848003] is a finding. Morphologies are used as the values of the defining attributes of findings and procedures. Findings are used to represent the combination of a morphology in a location. For example, *cyst of scalp* [300923002] represents “cystic” type of morphology that is in the location “scalp”.

Many morphologies have names that could be (mis)-interpreted as implying a process rather than a structure. For example, “inflammation” might mean the structural-morphologic features of inflammation, such as inflammatory cell infiltrates; or it might mean the process that results in those structural changes. Within the morphologic abnormality hierarchy, the structural interpretation is intended, and the process interpretation is not.

1.2 Morphology Hierarchy – General Structure

The hierarchy immediately under morphologically abnormal structure is given below, with bold font marking the broad categories that correspond to SNOMED 3 morphology sections (see text below):

abnormal cell

abnormal cellular component of blood

abnormal shape

absence

cellular or subcellular abnormality

collagen shrinkage

cutaneous patch

cutaneous plaque



damage

necrosis

traumatic abnormality

degenerative abnormality

depressed structure

developmental anomaly

effect of surgery

eruption

exfoliative lesion

extracellular alteration

fibrosis or repair abnormality

fusion

growth alteration

proliferation

proliferative mass

neoplasm and/or hamartoma

neoplasm

hernial opening

heterotopia

honeycomb appearance

inflammatory morphology

macule

mass

mast cell abnormality

mechanical abnormality

minimal lesion

narrowing

papule

pigment alteration

postmortem change

pseudomembrane

pseudotumor

redundant tissue

therapy-related morphologic change

tumor-like lesion

vegetation

widening

The classical organization of morphology in SNOMED 3 had ten sections, including:

Section 0: General morphologic terms [M-0]

Section 1: Traumatic abnormalities [M-1]

Section 2: Congenital anomalies [M-2]

Section 3: Mechanical abnormalities [M-3]



- Section 4: Types of inflammation [M-4]
- Section 5: Degenerative abnormalities [M-5]
- Section 6: Cellular and subcellular abnormalities [M-6]
- Section 7: Growth, maturation and non-neoplastic proliferations [M-7]
- Section 8: International classification of neoplasms (ICD-O). [M-8 and M-9]
- Section 9: Specific veterinary tumors [M-A and M-B]

Although the sections in SNOMED 3 were generally correct, a number of changes in the hierarchy were required to satisfy strict logical subtyping. For example, neoplasms are kinds of proliferation, which is a kind of growth abnormality. But fibrosis is not strictly a growth abnormality, so it is placed outside that hierarchy. Also the phrase “general morphologic term” names a term, not a morphologic abnormality, and this type of general catch-all phrase should be eliminated from the SNOMED CT hierarchies.

2 Specific policies related to morphology

2.1 Malignant tumor morphology and ICD-O

The origins of malignant tumor morphology codes can be traced to the Systematized Nomenclature of Pathology (SNOP) which was published in 1965. Subsequently the WHO has published three revisions of the morphology of ICD-O, and all three of these have been tightly coordinated with the M-8 and M-9 sections of SNOMED. For tumor morphology codes, ICD-O-2 codes and names were the same as both SNOMED 2 and SNOMED 3, and ICD-O-3 codes and names are the same as the corresponding concepts in SNOMED RT and SNOMED CT.

2.1.1 Formatting variations between ICD-O morphology and SNOMED CT tumor morphology

Minor formatting variations occur with these codes. In order to distinguish morphology codes from others in SNOMED, the SNOMED identifier has always prefixed the 5-character code with an “M” and a dash (“-”). ICD-O does not routinely do this. Another minor formatting variation that may be seen in ICD-O coded data is a forward slash (“/”) before the final character of the code. SNOMED does not ever do this. As a result, the code for “acidophil carcinoma”, for example, might appear in any of the following forms:

<i>Character string</i>	<i>Origin</i>
M-82803	SNOMED
8280/3	ICD-O
M-8280/3	combined



2.1.2 Non-synonymous synonyms in ICD-O

ICD-O does not necessarily provide a code for each morphologic variation of a given tumor type. It distinguishes between true synonyms and related terms. SNOMED CT often provides a morphology code for the related terms as a subtype, but it never assigns an “M-8....” or “M-9....” SNOMEDID to these codes. Instead it uses “R-.....” format codes. For example,

2.1.3 The use of “NOS” and “No ICD-O Subtype”

In ICD-O, a term may end with “NOS”, meaning “not otherwise specified”. This means “not otherwise specified in the patient record that I am coding.” But in the context of SNOMED CT, the originator of the code is the pathologist or other health care professional who actually generates the original record. In this context, it makes no sense to reference the record that they are coding, because they are using the terminology to represent their original meaning, not someone else’s recorded meaning.

The effect of “NOS” on a particular phrase in ICD-O is to specialize it to mean “none of the other subtypes of this.” For example, “adenocarcinoma NOS” means an adenocarcinoma that has not been specified to be any of the other kinds of adenocarcinoma that are available for coding in ICD-O.

Therefore in SNOMED CT, we revise the fully specified name of these concepts to be “no ICD-O subtype”, meaning that it is a kind of tumor morphology that does not fit any of the other subtypes of this morphology that are named in ICD-O.

2.2 Congenital anomaly

There is significant doubt about the usefulness of some of the congenital anomaly morphologies. Many disorders that involve congenital anomalies can be defined in terms of the OCCURRENCE attribute, leaving no need for a “congenital” version of the more general morphology concept. For example, 90293002 *congenital stenosis (morphologic abnormality)* could be removed because 415582006 *stenosis (morphologic abnormality)* can be combined with OCCURRENCE = *congenital* to define disorders that involve congenital stenosis.

Because they are currently in the hierarchy, these congenital morphology concepts should be properly placed. Congenital anomaly morphology concepts should usually have non-congenital parents. For example, *congenital stenosis* needs to be a child of *stenosis*, in addition to being a child of *congenital anomaly*.

2.3 Degeneration vs. Degenerative Abnormality

A distinction should be made between 33359002 *degeneration*, and 107669003 *degenerative abnormality*. Degenerative abnormalities, the broad group of concepts, are those morphologies characterized by retrogressive pathologic structural changes. Examples of these include degeneration proper as well as lyses, vascular scleroses, necroses and infarcts, depositions, dystrophies, pigmentations, atrophies and depletions. In other words, 107669003 *degenerative abnormality* is a grouping concept to put together this set of things that have in common the fact of retrogressive structural degeneration.

Morphologies under degeneration also show retrogressive structural changes, but they are not necessarily any of the following: atrophy, depletion, deposition, dystrophy, lysis, resorption, malacia, necrosis, obliteration, opacity, plaque, vascular sclerosis or postmortem change. This does seem to be definition by exclusion.



Necrosis is a degenerative abnormality, but not a degeneration. Necrosis can **follow** degeneration. Atrophy is a degenerative abnormality, but only atrophic degeneration is also a degeneration. As a general rule, we do not assume that diseases called "degenerative" necessarily have ASSOCIATED-MORPHOLOGY = 33359002 *degeneration* since the word "degenerative" sometimes refers to loss of function, rather than structural degeneration.

For those disorders called "degenerative" that have a specific structural degeneration, it is preferable to use a more specific value instead of the generic 33359002 *degeneration*, or even worse, the more general 107669003 *degenerative abnormality*.

Degenerative abnormality [107669003] should rarely, if ever, be used as the value of associated-morphology of a particular disorder; rather, a more specific subtype should be used as the value. It *might* be used as the value of ASSOCIATED-MORPHOLOGY for a broad category of degenerative disorders where the degeneration is always and necessarily structural. It will then be inherited by all the subtypes, unless specialized by assigning a particular subtype of *degeneration* [33359002] as the value of ASSOCIATED-MORPHOLOGY for that disorder.

2.4 Abscess

Although most abscesses are infectious, there are some sterile abscesses. In keeping with the policy that the fully-specified name represents the meaning of a code, if a code has an FSN that does not mention "sterile" or "infectious", the policy is to model the ASSOCIATED-MORPHOLOGY using the value *abscess morphology* [44132006].

3 Known issues and problems

3.1 Mixing extent, mechanism and timing of injury with the injury morphology codes

A number of morphology codes relate to the extent, mechanism and timing of injury. While these aspects can have some impact on the morphologic features of an injury, generally they are not definitional. Therefore these features should not be used in the morphology hierarchy. Instead, there should be attributes of clinical findings that can be used to define the extent, mechanism and timing of various injury disorder types.