3.1.3. Relationships

A Relationship represents an association between two Concepts.

Each Relationship is identified by a unique Relationship Id and is distributed as a row in the Relationship file.

A Relationship contains Identifiers of two logically associated Concepts and the Identifier of another Concept that indicates the Relationship Type by which they are associated.

Table 3.1.3-1: Example: Defining arthritis as a type of joint disorder

Relationship.id	sourceId	typeId	destinationId
	3723001 |Arthritis (disorder)|	116680003 |Is a (attribute)|	399269003 |Arthropathy (disorder)|
In human readable term...	3723001 |arthritis|	116680003 |is a|	399269003 |joint disorder|

Relationships and concept definitions

Each concept in SNOMED CT is logically defined through its relationships to other concepts.

Every activeSNOMED CT concept(except the SNOMED CT ConceptRoot concept) has at least one 116680003 |is a|relationship to a supertype concept. 116680003 |is a|relationships and defining attribute relationships are known as the defining characteristics of SNOMED CT concepts. They are considered defining because they are used to logically represent a concept by establishing its relationships with other concepts. This is accomplished by establishing 116680003 |Is a|relationships with one or more defining concepts(called supertypes) and modeling the difference with those supertypes through defining attributes.

Example: 263245004 |Fracture of tarsal bone (disorder)|is defined as:

- 116680003 |is a|subtype of 15574005 |Fracture of foot (disorder)|
- and has 363698007 |finding site| 108371006 |Bone structure of tarsus (body structure)|;
- and has 116676008 |associated morphology| 72704001 |Fracture (morphologic abnormality)|.

Note: A relationship is assigned only when that relationship is always known to be true.

Example: Group A Streptococcus causes most cases of Streptococcal pharyngitis. However, a small percentage of these cases are caused by other species of Streptococcus. Therefore, it would be incorrect to define 43878008 |Streptococcal sore throat (disorder)| as having 246075003 |causative agent| 80166006 |Streptococcus pyogenes (organism)|. Instead it is correctly defined as having the more general 246075003 |causative agent| 58800005 |Genus Streptococcus (organism)|.

IS A Relationships

116680003 |is a|relationships are also known as "Supertype - Subtyperelationships" or "Parent - child relationships". 116680003 |is a|relationships are the basis of SNOMED CT hierarchies, as illustrated below.

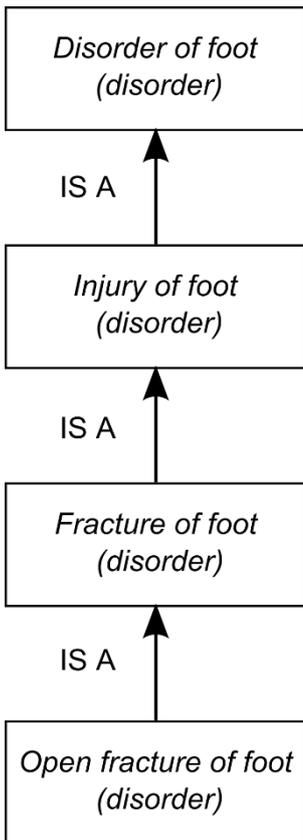**Figure 3.1.3-1: Example IS A hierarchy**

A concept can have more than one 116680003 |is a|relationship to other concepts. In that case, the concept will have parent concepts in more than one sub-hierarchy of a top-level hierarchy. Subtyperelationships can be multi-hierarchical.

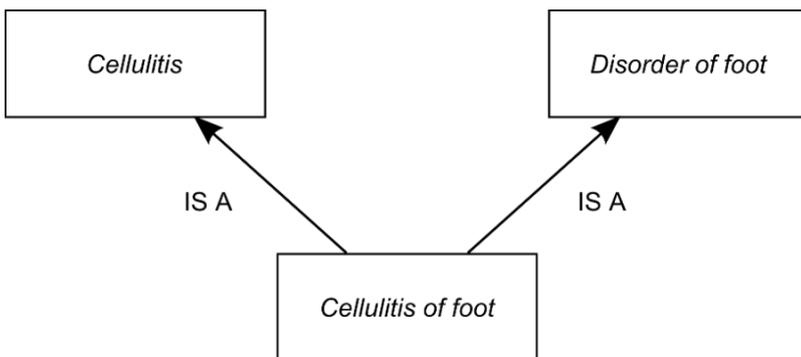**Figure 3.1.3-2: Example IS A Relationships**

Attribute Relationships

An attributerelationship is an association between two concepts that specifies a defining characteristic of one of the concepts(the source of the relationship). Each attributerelationship has a name (the type of relationship) and a value (the destination of the relationship).

The combination of the attributerelationships and 116680003 |is a|relationships associated with a concept represent the logical definition of that concept. Therefore, the logical concept definition includes one or more supertypes (represented by 116680003 |is a|relationships), and a set of defining attributes that differentiate it from the other concept definitions.

Example:

Since pneumonia is a disorder of the lung, the logical definition of the concept 233604007 |Pneumonia (disorder)| in SNOMED CT includes the following relationship. The Attribute 363698007 |Finding site| is assigned the value 39607008 |Lung structure (body structure)|.

- 363698007 |Finding site| = 39607008 |Lung structure (body structure)|

The full definitions of the concepts 233604007 |Pneumonia (disorder)|, 312342009 |Infective pneumonia (disorder)| and 53084003 |Bacterial pneumonia (disorder)| are shown below. The first lines in each example refer to supertypes of the defined concept. Each of the subsequent lines refines the definition by specifying an attribute with a value.

```
=== 95436008 |Lung consolidation (disorder)|  +
    205237003 |Pneumonitis (disorder)|  :
      { 116676008 |Associated morphology (attribute)|  =  707496003 |Inflammation and consolidation (morphologic abnormality)| ,
        363698007 |Finding site (attribute)|  =  39607008 |Lung structure (body structure)|  }
```

Figure 3.1.3-3: Definition of |Pneumonia (disorder)|

```
=== 128601007 |Infectious disease of lung (disorder)|  +
    233604007 |Pneumonia (disorder)|  :
      { 370135005 |Pathological process (attribute)|  =  441862004 |Infectious process (qualifier value)| ,
        116676008 |Associated morphology (attribute)|  =  707496003 |Inflammation and consolidation (morphologic abnormality)| ,
        363698007 |Finding site (attribute)|  =  39607008 |Lung structure (body structure)|  }
```

Figure 3.1.3-4: Definition of |Infective pneumonia (disorder)|

```
=== 312119006 |Bacterial lower respiratory infection (disorder)|  +   /
    312342009 |Infective pneumonia (disorder)|  :
      { 370135005 |Pathological process (attribute)|  =  441862004 |Infectious process (qualifier value)| ,
        116676008 |Associated morphology (attribute)|  =  707496003 |Inflammation and consolidation (morphologic abnormality)| ,
        363698007 |Finding site (attribute)|  =  39607008 |Lung structure (body structure)| ,
        246075003 |Causative agent (attribute)|  =  409822003 |Superkingdom Bacteria (organism)|  }
```

Figure 3.1.3-5: Definition of |Bacterial pneumonia (disorder)|

Figure 3.1.3-6 illustrates some of these Relationships graphically. 116680003 |is a|Relationships relate a concept to more general concepts of the same type. In contrast, AttributeRelationships (such as 363698007 |Finding site| and 246075003 |Causative agent|) relate a concept to relevant values in other branches of the subtype hierarchy.
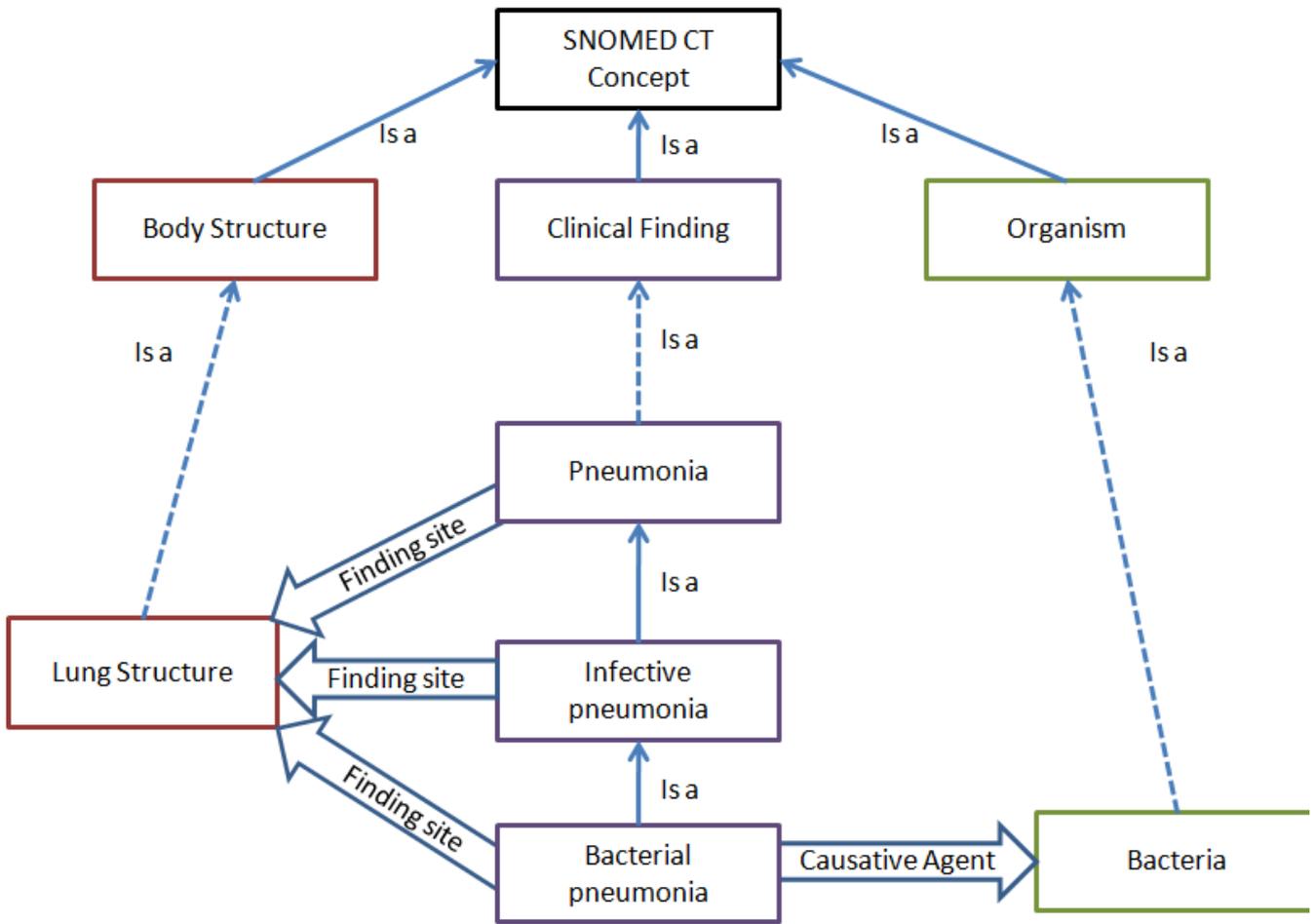
Figure 3.1.3-6: Illustration of Defining Relationships

Related Links

- Editorial Guide

    - Attributes
    - Domain Specific Modeling
- Relationship file
- Relationship