| Definition |
| --- |
| Information about a quality/property to be observed and how it will be observed |

## Observable Entity vs. Evaluation Procedure

The observable entity and evaluation procedure hierarchies have some of the same attributes. There is not and should not be a one-to-one correspondence between the two hierarchies.

At this time, SNOMED CT contains some concepts in the evaluation procedure hierarchy which logically belong in the observable entity hierarchy. This is a legacy problem that continues to cause confusion. These concepts will move to the observable entity hierarchy as part of the QI project in the future. In addition, if we identify existing duplicate concepts between the two hierarchies, this will also be corrected. Concepts will not be duplicated between the observable entity hierarchy and procedure hierarchy, and requests for such will not be added.

While some users have indicated they want to use a procedure concept for ordering a test and an observable concept for reporting the result, this is not an acceptable use case. An evaluation procedure being ordered implies that there is an expectation that a value, in association with the ordered procedure will be provided. Evaluation procedures, for all intents and purposes, are observables with another semantic tag. The nature of their top level parent (Evaluation procedure) implies that they require a value in order to be assessed. Thus they can be used equivalently with observables.

As for the progression of the completion of an assessment, that is related to the state diagram (i.e., status) of the progression of a procedure and should not be precoordinated, but handled by the information system in which orders are processed (it is dynamic, not static). The information system should be able to capture the status of a procedure (e.g., ordered, in process, completed). We would not expect the terminology to pre-coordinate this.

As an example, LOINC recognizes that there are three different aspects to an observable: 1) those that can serve as both an order and an observation (e.g. blood glucose level); 2) those that can be ordered but not directly resulted (e.g. urinalysis, which is a convenience order for multiple individual observations on urine); and 3) those that can only be resulted and not directly ordered (usually part of an automated system, such as computation of MCHC in hematology). LOINC assigns this aspect with an attribute value. It is not one of the six main LOINC parts typically visible to users, however it is included in the LOINC database.

## Use of Observable Entities

Observables entities may be used to:

- Code elements on a checklist or assign values to elements.

  For example, *color of nail* is an observable entity. *Gray nails* is a finding.

- Code headers on a template

  For example, the observable entity, gender, may be used to code a section of a template titled gender. The user would choose masculine, feminine, transgender, etc. which would then constitute a finding such as 703117000 |Masculine gender (finding)|.

### Types of Observable Entities

There are four general types of observable entities for use in health care. Each has different representation requirements and patterns, i.e. the set of attributes will vary.

- **Quality.** A characteristic, feature, or property that is inherent in someone or something.

  For example, mass of a person, temperature of internal organs, concentration of sodium in plasma, angle of a joint

- **Disposition.** A characteristic or feature that is not always realized in full.

  For example, antibiotic susceptibility of a certain population

- **Function.** The ability of a person, some part of a person, or a thing to perform activities or realize processes.

  For example, ability to walk

- **Process.** A process or outcome of a process

  For example, secretion rate, heart rate, respiratory rate

# Observable Entity Defining Attributes

The observable model has been scarcely implemented in current SNOMED content, so the following defining attributes that correspond to the *Observable Entity Attributes Summary* table will have many hypothetical examples.

## Characterizes

This attribute specifies the process which the property describes, and on which the property (of this observable) depends. The process can be very general (e.g. excretion).

For example,

- Mass concentration ratio of silver to creatinine in 24 hour urine (observable entity) has 704321009 |Characterizes (attribute)| of excretion process
- Estimated intake of potassium in 24 hours (observable entity)| has a 704321009 |Characterizes (attribute)| of administration of substance

## Component

This attribute is used to specify the numerator of a relational property types, e.g. ratio, concentration.

For example,

- Arbitrary concentration of Varicella-Zoster virus (observable entity) has the *246093002* |*Component (attribute)*| of Human herpesvirus 3

## Direct site

This attribute is used to specify the entity on which the observation is directly made. It may also be used when the observation is indirect, i.e. when a direct observation cannot be done.

For example,

- 415974002 |Core body temperature measured at tympanic membrane (observable entity)| has the 704327008 |Direct site (attribute)| of tympanic membrane structure

- 871557008 | Detection of ribonucleic acid of Severe acute respiratory syndrome coronavirus 2 in oropharyngeal swab (observable entity) | has the 704327008 |Direct site (attribute)| of 461911000124106 | Swab specimen from oropharynx (specimen) |

## Has realization

This attribute is used to specify the process or activity that is the consequence of realization of the function.

For example,

- 282097004 |Ability to walk (observable entity)| 719722006 |Has realization (attribute)| of walking

## Inherent location

This attribute is used to specify a body site or other location of the independent continuant in which the property exists.

For example,

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- DNA taxon of Mycobacterium from bronchial secretions (observable entity) has 718497002 |Inherent location (attribute)| of bronchus

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## Inheres in

This attribute specifies the independent continuant in which the quality exists and on which the dependent quality (of this observable) depends.

For example,

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- Volume of 24-hour urine sample (observable entity) has 704319004 |Inheres in (attribute)| of 24 hour urine sample

## Precondition

This attribute is used to specify body state, timing, challenges, or other situations that must be true of the entity to be observed.

For example,

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- Plasma creatinine concentration 7 days post challenge (observable entity) has a Precondition of 7 days post challenge
- 163033001 |Lying blood pressure (observable entity)| has a 704326004 |Precondition (attribute)| of recumbent body position

## Procedure device

This attribute is used to model devices associated with a procedure. This attribute is used to define high-level, general concepts that aggregate procedures according to the device involved.

## Process agent

This attribute is used to specify the continuant (e.g. body structure or organism) that is causally active in the process on which the property depends. It may refine the meaning of the process named as the value

of 704321009 |Characterizes (attribute)|, or it may simply repeat the meaning that is already there. The process agent can be left unspecified.

For example,

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- Substance rate of secretion of somatotropin by pituitary following clonidine per os (observable entity) has the 704322002 |Process agent (attribute)| of pituitary gland.

**Process agent and has agent**
704322002 |Process agent (attribute)| appears to have the same meaning as Has agent in the Open Biological and Biomedical Ontology (OBO) Relations Ontology.

## Process duration

This attribute specifies the duration of the process characterized by the observable property type.

For example,

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- Mass rate of excretion of cortisone in 24 hour urine (observable entity) has the 704323007 |Process duration (attribute)| of 24 hours

## Process output

This attribute is used to specify the substance or process produced by the process characterized by the observable property type.

For example,

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- Substance rate of excretion of pregnanediol in micromoles per day (observable entity) has a 704324001 |Process output (attribute)| of pregnanediol
- Estimated intake of iron in 24 hours (observable entity)| has a 704324001 |Process output (attribute)| of iron

## Property

This attribute is used to specify the type of inherent quality or process to be observed. Its values are abstract types of quality (length, odor, concentration) or abstract types of process features (rate, speed).

For example,

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- Mass concentration of glucose in blood (observable entity) has the 370130000 |Property (attribute)| of mass concentration

## Relative to

This attribute is used to specify the denominator of a relational property type, e.g. a ratio or proportion.

For example,

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- Urine alpha aminobutyrate to creatinine ratio (observable entity) has 704325000 |Relative to (attribute)| creatinine
- Neutrophils per 100 leukocytes in blood (observable entity) has 704325000 |Relative to (attribute)| population of all leukocytes in portion of fluid

## Relative to part of

This attribute is used to specify the denominator of a relative relational property, such as a ratio of ratios.

For example,

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- Relative substance concentration of cerebrospinal fluid IgM to plasma IgM (observable entity) has 719715003 |Relative to part of (attribute)| of plasma

## Scale Type

This attribute is used to specify the scale of the result of an observation or a diagnostic test (i.e., quantitative, qualitative, semi-quantitative).
When defining observable entities for the international release, the |Scale type (attribute)| will not be used. Extensions are permitted to add specific subtypes of observable entities that include the |Scale type (attribute)|, if desired.

### Technique

This attribute is used to specify the systematic method of an observation.

For example,

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- Presence of Brucella abortus antibody in serum by latex agglutination (observable entity) has the 246501002 |*Technique (attribute)*| of latex agglutination test technique

## Time Aspect

This attribute is used to specify the timing of an observation.

For example,

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- Substance concentration of acetone in urine (observable entity) has the 370134009 |Time aspect (attribute)| of Single point in time

## Towards

This attribute is used to specify a disposition, what the disposition is towards, i.e. a specific triggering agent, or more generally, participant in the realization of the disposition.

For example,

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- Quantitative susceptibility of Pseudomonas aeruginosa to amikacin in microbial isolate by disk diffusion (observable entity) has 704320005 |Towards (attribute)| of amikacin

### Units

This attribute is used to specify the units used in assigning a value to an observation.

For example,

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- Basophils per 100 leukocytes (observable entity) has the *246514001* |*Units (attribute)*| of percentage

## Using device

This attribute is used to specify the instrument or equipment utilized to execute an action. Using device is appropriate when the device is actually used to carry out the action that is the focus of the procedure.

For example,

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- 415921007 |Temperature of forehead using skin strip thermometer (observable entity)| has *424226004* |*Using device (attribute)*| of skin strip thermometer