3 Common Patterns

 3.1 Introduction

Common patterns are clinical statements that are used frequently, often in many different specifications, for a wide variety of communication use cases. The patterns shown here are based upon the Principles and Guidelines defined above, and represent informative examples, unless otherwise stated. [8](file:///C%3A%5C%5CUsers%5C%5CLisa%5C%5CDocuments%5C%5C05%20Professional%5C%5C90%20HL7%5C%5C00%20Standard%20-%20TermInfo%5C%5CTermInfo%20Course%2020130506%5C%5Chtml%5C%5Cinfrastructure%5C%5Cterminfo%5C%5Cterminfo.htm%22%20%5Cl%20%22fn8)

**NOTE:** The approach taken in the development of these patterns is to build upon the modeling work being done within HL7 domain committees. In many cases, the patterns presented here are small subsets of more complete domain models, often greatly simplified so as to illustrate certain principles. Actual instances must conform to the particular HL7 V3 specification being communicated.

 3.1.1 Observations vs. Organizers

The RIM defines the abstract ActClass "ActClassRecordOrganizer" as a navigational structure or heading used to group a set of acts sharing a common context. Record organizers include such structures as folders, documents, document sections, and batteries. The Clinical Statement model includes an Organizer class, whose class code can be valued with an ActClassRecordOrganizer subtype. Where the Organizer class is used, the value of Organizer.code **MAY** be drawn from the SNOMED CT [ (<<419891008 | Record artifact | ) OR (<<386053000 | Evaluation procedure | ) ] hierarchies.[9](file:///C%3A%5C%5CUsers%5C%5CLisa%5C%5CDocuments%5C%5C05%20Professional%5C%5C90%20HL7%5C%5C00%20Standard%20-%20TermInfo%5C%5CTermInfo%20Course%2020130506%5C%5Chtml%5C%5Cinfrastructure%5C%5Cterminfo%5C%5Cterminfo.htm%22%20%5Cl%20%22fn9) .

It is often the case that there is a close correspondence between a particular kind of clinical statement (e.g. a blood pressure reading) and the organizer where the clinical statement is commonly found (e.g. a vital signs section). The patterns presented here are irrespective of and not dependent on the organizer in which they are found. Thus, the pattern for allergies and adverse reactions should be used regardless of any organizers they may or may not be contained in; and any distinction between a finding vs. disorder vs. diagnosis needs to be made explicit in the clinical statement itself, without reliance on the containing organizer. Stated in another way, a clinical statement needs to be a correct assertion by itself, when viewed outside the organizer.[10](file:///C%3A%5C%5CUsers%5C%5CLisa%5C%5CDocuments%5C%5C05%20Professional%5C%5C90%20HL7%5C%5C00%20Standard%20-%20TermInfo%5C%5CTermInfo%20Course%2020130506%5C%5Chtml%5C%5Cinfrastructure%5C%5Cterminfo%5C%5Cterminfo.htm%22%20%5Cl%20%22fn10)

 3.1.2 Observation code and value (in event mood)

A recurring issue for many observation events, regardless of the particular pattern, is determining how to populate observation.code and observation.value. While this is typically straight-forward for laboratory observations, it can get blurry for other types of observations, such as findings and disorders, family history observations, etc.

The intent of this section is to illustrate the acceptable patterns. Subsequent sections do not include all possible permutations of code/value split, and it should be assumed that any of the acceptable patterns described here would be equally applicable.

 3.1.2.1 Acceptable patterns for Observation code/value

Based on these guiding principles come the following acceptable patterns:

**PATTERN ONE:** Observation.code [ (<<363787002 | Observable entity | ) OR (<<386053000 | Evaluation procedure | ) ] ; Observation.value = not null (e.g. numeric, nominal, ordinal, coded result).

**NOTE:** At the time of this writing, the SNOMED Standards Development Organization is debating whether or not Observable entity concepts should be recommended for use in Observation.code.

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| Example 5. Observation code/value: observable entity with result |
| <observation classCode="OBS" moodCode="EVN"> <code code="50373000|Height|" codeSystemName=”SNOMED CT” codeSystem="2.16.840.1.113883.6.96"> <displayName value="Height"/> </code> <text>Height: 177 cm</text> <value xsi:type="PQ" value="1.77" unit="m"/></observation><observation classCode="OBS" moodCode="EVN"> <code code="247030006|Eye color|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Eye color"/> </code> <text>Green eyes</text> <value xsi:type="CD" code="371246006|Green|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Green"/> </value></observation>  |

"2.16.840.1.113883.6.96" is the OID designation for the code system SNOMED CT.

**PATTERN TWO:** Observation.code = "ASSERTION" (codeSystem="2.16.840.1.113883.5.4"); Observation.value [ (<<413350009 | Finding with explicit context) OR (<<404684003 | Clinical finding) ] .

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| Example 6. Observation code/value: assertion of a clinical finding |
| <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION"  codeSystem="2.16.840.1.113883.5.4"/> <text>Headache</text> <value xsi:type="CD" code="25064002|Headache|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Headache"/> </value></observation>  |

In this example, the observation is simply the assertion of a "headache". If there is a need to distinguish between, say, a patient-reported symptom vs. a clinician-asserted diagnosis, more information would need to be present. Thus, while an acceptable pattern is to assert a clinical finding, that may not convey sufficient context for all communication use cases. Likewise, an assertion of a procedure.code (such as for an appendectomy performed 5 years ago) doesn't distinguish between a patient's reported past surgical history vs. information gleaned from chart review, and additional contextual information will be needed in some cases.

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| Example 7. Observation code/value: assertion of a clinical finding with explicit context |
| <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <text>Presence of headache</text> <value xsi:type="CD" code="373573001|Clinical finding present|:246090004|Associated finding|=25064002|Headache|" codeSystem="2.16.840.1.113883.6.96"/></observation>  |

In this example, a finding with explicit context is used to assert the presence of a headache.

An HL7 Observation in event mood is analogous to a SNOMED CT [ 404684003 | Clinical Finding ], and an HL7 Observation in event mood with explicit context (such as presence or absence, subject, past or present) is analogous to a SNOMED CT [ 413350009 | Finding with explicit context ]. Noting this, and drawing from section "Codes and Values" above, come the following guiding principles for populating observation.code and observation.value:

* Acceptable patterns shall be fully transformable amongst each other (by a machine, with no loss of semantics).
* Acceptable patterns shall not conflict with SNOMED CT's definitions, where only certain hierarchies (e.g. [ 363787002 | Observable entity | ], [ 386053000 | Evaluation procedure | ]) are defined as being able to take on values (i.e. have an associated observation.value).
* Acceptable patterns shall not conflict with the RIM, which defines the Act class as "a record of something that is being done, has been done, can be done, or is intended or requested to be done", and defines the Act.code attribute as "a code specifying the particular kind of Act that the Act-instance represents within its class".

 3.1.3 Source of information

Another recurring issue for many clinical statements is the representation of how the information in that statement was obtained (e.g. patient-reported symptom, gleaned from chart review, physical exam finding). Whether or not the source of information needs to be included in a particular communication is outside the scope of this guide, but in some cases, such as the recording of patient medications, knowing the source of the information can have significant clinical implications, and since there are overlaps in HL7 and SNOMED CT representations, the topic is addressed in this guide.

Common sources include: [1] Previously recorded information (e.g. a patient-authored questionnaire, a problem list entry, a lab report); [2] Informant (e.g. the patient, a witness); [3] Direct examination (e.g. a physical examination finding, a radiographic finding, an automated specimen analysis).

Various ways by which the source of information can be represented include:

* SNOMED CT defining attributes (whether pre- or post-coordinated)
	+ [ 418775008 | Finding method ]: Used to indicate the method by which a finding was ascertained.
	+ [ 419066007 | Finding informer ]: Used to indicate the informant of a finding.
	+ [ 260686004 | Procedure method ]: Used to indicate the method by which a procedure is performed.
	+ [ 370129005 | Measurement method ]: Used to indicate the method by which an observable entity or evaluation procedure is performed.
* RIM attributes
	+ Procedure.methodCode: Identifies the means or technique used to perform the procedure.
	+ Observation.methodCode: A code that provides additional detail about the means or technique used to ascertain the observation.
* RIM participants
	+ Informant (INF): A source of reported information.
* RIM act relationships
	+ Excerpt (XCRPT): The source is an excerpt from the target.
	+ Verbatim excerpt (VRXCRPT): The source is a direct quote from the target.

 3.1.3.1 Acceptable patterns for source of information

Patterns for the common sources listed above include:

**PATTERN ONE:** Source is previously recorded information.

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| Example 8. Current observation is directly referenced from something previously recorded. |
| <observation classCode="OBS" moodCode="EVN"> <id root="3568dbe1-8f49-11da-a72b-0800200c9a66"/> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <text>Headache, per problem list</text> <value xsi:type="CD" code=" 25064002|Headache|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Headache"/> </value> <actRelationship typeCode="XCRPT"  contextConductionInd="false"> <actReference classCode="OBS" moodCode="EVN"> <id root="201877f1-8f49-11da-a72b-0800200c9a66"/> </actReference> </actRelationship></observation>  |

This pattern uses an actRelationshipType of "XCRPT" to indicate that there is a new observation which represents an excerpt of previously recorded information. The ActReference class is used here as the target, but other clinical statement act choices could also be used. Context conduction to the ActReference class is blocked by setting contextConductionInd to "false".

**PATTERN TWO: Source is informant.**

The distinction between the excerpt relationship in the prior figure and an informant participant discussed here can be blurry, such as when a clinician is drawing upon the patient's recollection and a prior record of medication use to determine the current medication usage. An informant (or source of information) is a person who provides relevant information, whereas an excerpt is a sub portion of some other act.

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| Example 9. Informant is the father |
| <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <text>Father says that the patient has a headache.</text> <value xsi:type="CD" code="25064002|Headache|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Headache"/> </value> <informant typeCode="INF"> <relatedEntity classCode="PRS"> <code code="66839005|Father|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Father"/> </code> </relatedEntity> </informant></observation><observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <text>Father says that the patient has a headache.</text> <value xsi:type="CD" code="25064002|Headache|:419066007|Finding informer|=66839005|Father|" codeSystem="2.16.840.1.113883.6.96"/></observation> |

The first example uses an Informant participant to indicate that the observation is gleaned through the record subject's father, and the second example expresses the same thing using the finding informer attribute in a post-coordinated expression.

The first example is particularly useful where there is a need to identify or provide additional specifics about the informant participant. Where both informant participant and finding informer are present, the former should be the same as or a specialization of the latter.

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| Example 10. Source is patient-reported symptom |
| <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <text>Patient states he has a headache</text> <value xsi:type="CD" code="25064002|Heachache|:419066007|Finding informer|=116154003|Patient|" codeSystem="2.16.840.1.113883.6.96"/></observation>  |

This example shows the use of the finding informer attribute to indicate that the patient is the source of the information. It will commonly be the case that a V3 instance will assert an informant participant, which will propagate to nested observations. Therefore it won't often be necessary to directly assert a finding informer of patient.

**PATTERN THREE:** Source is direct examination.

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| Example 11. Source is direct examination of patient |
| <observation classCode="OBS" moodCode="EVN"> <code code="77989009|Measurement of skin fold thickness|:370129005|Measurement method|=5880005|Physical exam|" codeSystem="2.16.840.1.113883.6.96"/> <text>Skin fold thickness is 7cm</text> <value xsi:type="PQ" value="7" unit="cm"/></observation> |

This pattern uses the SNOMED CT measurement method attribute to qualify a measurement procedure concept, indicating that the observation was determined via physical exam.

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| Example 12. Source is direct examination of radiograph |
| <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>  <text>Hilar mass on chest CT</text> <value xsi:type="CD" code="309530007|Hilar mass|:418775008|Finding method|=169069000|CT chest|" codeSystem="2.16.840.1.113883.6.96"/> <actRelationship typeCode="SUBJ" contextConductionInd="false"> <observation classCode="DGIMG" moodCode="EVN"> <id root="9cc8b460-8f47-11da-a72b-0800200c9a66"/> <code code="169069000|CT chest|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="CT chest"/> </code> </observation> </actRelationship></observation>  |

This pattern uses the SNOMED CT finding method attribute to qualify a finding concept, indicating that the finding was determined via CT chest. To relate the finding to the actual CT scan being observed, the example uses an act relationship of type "SUBJ", with blocked context conduction.

 3.2 Allergies and Adverse Reactions

Both SNOMED CT and HL7 differentiate an isolated reaction event from the condition of being allergic or intolerant. For instance, the following hierarchy is present in SNOMED CT:

* [ 404684003 | Clinical finding ]
	+ [ 420134006 | Propensity to adverse reactions ]
		- [ 106190000 | Allergy ]
			* [ 416098002 | Drug allergy ]
	+ [ 281647001 | Adverse reaction ]
		- [ 416093006 | Allergic reaction to drug ]

Different SNOMED CT value sets may apply, depending on the application context. Potential value sets include:

* **Substance/Product value set:** [11](file:///C%3A%5C%5CUsers%5C%5CLisa%5C%5CDocuments%5C%5C05%20Professional%5C%5C90%20HL7%5C%5C00%20Standard%20-%20TermInfo%5C%5CTermInfo%20Course%2020130506%5C%5Chtml%5C%5Cinfrastructure%5C%5Cterminfo%5C%5Cterminfo.htm%22%20%5Cl%20%22fn11) Values drawn from [ 105590001 | Substance ] and/or [ 373873005 | Pharmaceutical / Biologic product ] hierarchies, might be used where the context is the recording of substances to which the patient is allergic (e.g. a data entry box labeled "ALLERGIES").[12](file:///C%3A%5C%5CUsers%5C%5CLisa%5C%5CDocuments%5C%5C05%20Professional%5C%5C90%20HL7%5C%5C00%20Standard%20-%20TermInfo%5C%5CTermInfo%20Course%2020130506%5C%5Chtml%5C%5Cinfrastructure%5C%5Cterminfo%5C%5Cterminfo.htm%22%20%5Cl%20%22fn12)
* **Findings value set:** Values drawn from [ 413350009 | Finding with explicit context ] and/or [ 404684003 | Clinical finding ] hierarchies, might be used where the context is an encounter diagnosis or a problem list.

**NOTE:** The HL7 Patient Care Technical Committee is developing a formal model for allergy tracking, which supports the representation of the sequential determination of primary and secondary observations relating to discovery and analysis of adverse reactions. The examples provided here are greatly simplified so as to illustrate certain aspects of SNOMED CT implementation.

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| Example 13. Allergies coded with Substance/Product value set |
| <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <text>Allergy to PCN manifesting as hives</text> <value xsi:type="CD" code="106190000|Allergy|:246075003|Causitive agent|=373270004|Penicillin - class of antibiotic - (substance)" codeSystem="2.16.840.1.113883.6.96"/> <actRelationship typeCode="MFST" inversionInd="true" contextConductionInd="true"> <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <value xsi:type="CD" code="247472004|Hives|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Hives"/> </value> </observation> </actRelationship></observation> |

Where the clinician fills in both the substance/product and the reaction, context can propagate across the MFST relationship. The manifestation should not be post-coordinated with the allergic disorder (i.e. this guide recommends against a single post-coordinated expression such as "penicillin allergy manifesting as hives").

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| Example 14. Allergies coded with Findings value set |
| <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <value xsi:type="CD" code="91936005|Allergy to penicillin|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Allergy to penicillin"/> </value> <text>Allergy to PCN</text></observation>  |

In this case, the selected finding indicates the condition of being allergic.

 3.3 Assessment Scale Results

An assessment scale is a collection of observations that together yield a summary evaluation of a particular condition. Examples include the Braden Scale (used for assessing pressure ulcer risk), APACHE Score (used for estimating mortality in critically ill patients), Mini-Mental Status Exam (used to assess cognitive function), APGAR Score (used to assess the health of a newborn), and Glasgow Coma Scale (used for assessment of coma and impaired consciousness.)

Assessment scales share certain features, which are described here as part of a recommended pattern:

1. Assessment scales have one or more component observations that can be taken in aggregate to provide an overall score (e.g. [ 248241002 | Glasgow Coma score ]).
2. Assessment scale component observations can be represented as a question and answer (e.g. [ 248240001 | Motor response ] = "3") or as a finding (e.g. [ 85157005 | Decorticate posture ]). Either or both of these representations may need to be communicated, depending on the use case.

The following Figure shows a sample Glasgow Coma Scale and result. A score is given for each of three types of neurological responses. A Coma Score of 13 or higher indicates a mild brain injury, 9 to 12 is a moderate injury and 8 or less a severe brain injury.

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| Table 8: Glasgow Coma Scale  |
| **Glasgow Coma Scale**  | **Value** | **Score** |
| **Eye Opening** |
| spontaneous | 4 |   |
| to speech | 3 |   |
| to pain | 2 | 2 |
| no response | 1 |   |
| **Motor Response** |
| obeys verbal command | 6 |   |
| localizes pain | 5 |   |
| flexion-withdrawal | 4 |   |
| flexion-abnormal | 3 | 3 |
| extension | 2 |   |
| no response | 1 |   |
| **Verbal Response** |
| oriented and converses | 5 |   |
| disoriented and converses | 4 |   |
| inappropriate words | 3 |   |
| incomprehensible sounds | 2 | 2 |
| no response | 1 |   |
| **Glasgow Coma Score** | **7** |

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| Example 15. Glasgow Coma Score assessment scale result pattern |
| <observation classCode="OBS" moodCode="EVN">  <code code="248241002|Glasgow coma score" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Glasgow coma score"/>  </code> <derivationExpr/>  <value xsi:type="INT" value="7"/>  <actRelationship typeCode="DRIV">  <observation classCode="OBS" moodCode="EVN">  <code code="288598006|verbal response|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="verbal response"/>  </code> <value xsi:type="INT" value="2"/>  </observation>  </actRelationship>  <actRelationship typeCode="DRIV">  <observation classCode="OBS" moodCode="EVN">  <code code="248240001|Motor Response|" codeSystem="2.16.840.1.113883.6.96"gt; <displayName value="Motor Response"/>  </code> <value xsi:type="INT" value="3"/>  <actRelationship typeCode="XFRM">  <observation classCode="OBS" moodCode="EVN">  <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <value xsi:type="CD" code="85157005|Decorticate posture|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Decorticate posture"/> </value> </observation>  </actRelationship>  </observation>  </actRelationship> </observation>  |

The aggregate observation is modeled as a component of the assessment procedure. The <derivationExpr> can contain a formal language expression specifying how the value is computed. Component observations are nested under the aggregate observation, linked with a "DRIV" (is derived from) relationship. Where a component observation needs to be communicated in different formats, each format is a discrete observation, linked by a "XFRM" relationship.

 3.4 Observation, Condition, Diagnosis, Concern

**NOTE:** The HL7 Patient Care Technical Committee is developing a formal model for condition tracking. The examples provided here are greatly simplified so as to illustrate certain aspects of SNOMED CT implementation.

Observations, Conditions, Diagnoses, and Concerns are often confused, but in fact have distinct definitions and patterns.

* "Observation" and "Condition": An HL7 observation is something noted and recorded as an isolated event, whereas an HL7 condition is an ongoing event. Symptoms and findings (also know as signs) are observations. The distinction between "seizure" and "epilepsy" or between "allergic reaction" and "allergy" is that the former is an observation, and the latter is a condition.

SNOMED CT distinguishes between "Clinical Findings" and "Diseases", where a SNOMED CT disease is a kind of SNOMED CT clinical finding that is necessarily abnormal:
	+ [ 404684003 | Clinical finding ]
		- [ 64572001 | Disease ]

The SNOMED CT finding/disease distinction is orthogonal to the HL7 observation/condition distinction, thus a SNOMED CT finding or disease can be an HL7 observation or condition.

* "Diagnosis": The term "diagnosis" has many clinical and administrative meanings in healthcare
	+ A diagnosis is the result of a cognitive process whereby signs, symptoms, test results, and other relevant data are evaluated to determine the condition afflicting a patient.
	+ A diagnosis often directs administrative and clinical workflow, where for instance the assertion of an admission diagnosis establishes care paths, order sets, etc.
	+ A diagnosis is often something that is billed for in a clinical encounter. In such a scenario, an application typically has a defined context where the billable object gets entered.
* "Concern": A concern is something that a clinician is particularly interested in and wants to track. It has important patient management use cases (e.g. health records often present the problem list or list of concerns as a way of summarizing a patient's medical history).

Differentiation of Observation, Condition, Diagnosis, and Concern in common patterns:

* "Observation" and "Condition": The distinction between an HL7 Observation and HL7 Condition is made by setting the Act.classCode to "OBS" or "COND", respectively. The distinction between a SNOMED finding and SNOMED disease is based on the location of the concept in the SNOMED CT hierarchy. There is no flag in a clinical statement instance for distinguishing between a SNOMED CT finding vs. disease.
* "Diagnosis":
	+ Result of a cognitive process: Could potentially be Indicated by post-coordinating a SNOMED CT finding method attribute with a procedure such as "cognitive process".
	+ Directs administrative and clinical workflow: These use cases typically rely more on the context in which the diagnoses are entered (e.g. where an order set has a field designated for the admission diagnosis). In such a case, the distinction of a (particular kind of) diagnosis is that it occurs within a particular organizer (e.g. a condition within an Admission Diagnosis section is an admission diagnosis from an administrative perspective).
		- Something that is billed for: The fact that something was billed for would be expressed in another HL7 message. There is nothing in the pattern for a diagnosis that says whether or not it was or can be billed for.
* "Concern": The HL7 Patient Care Technical Committee is developing a formal model for condition tracking. In that model, a problem (which may be an Observation, a Procedure, or some other type of Act) is wrapped in an Act with a new Act.classCode “CONCERN”. The focus in this guide is on the use of SNOMED CT, whereas the Patient Care condition tracking model is the definitive source for the overall structure of a problem list.

It should be noted that the administrative representation of a diagnosis and the representation of a concern break the rules from section ‎3.1.1 Observations vs. Organizers, in that these designations are based on context, whereas the designation of something as an Observation vs. Condition is inherent in the clinical statement itself.

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| Example 16. Assertion of a clinical finding |
| <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <text>Headache</text> <value xsi:type="CD" code="25064002|Headache|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Headache"/> </value></observation> |

The observation is asserting a clinical finding of "headache".

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| Example 17. Context-dependent (administrative) assertion of a diagnosis |
| <act classCode="DOCSECT" moodCode="EVN"> <code code="8646-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"/> <title>Hospital Admission Diagnosis</title> <text>Hospital admission diagnosis of headache</text> <actRelationship typeCode="COMP"> <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <value xsi:type="CD" code="25064002|Headache|" codeSystem="2.16.840.1.113883.6.96"> <displayName="Headache"/> </value> </observation> </actRelationship></act> |

That a given diagnosis is, for instance, an Admission Diagnosis, can be asserted by wrapping the observation within a particular organizer.

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| Example 18. Example of a problem list containing concerns |
| <act classCode="DOCSECT" moodCode="EVN"> <code code="11450-4" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"/> <title>Problem List</title> <text> <list> <item>Headache</item> <item>Osteoarthritis of knee</item> </list> </text> <actRelationship typeCode="COMP">  <act classCode="CONCERN" moodCode="EVN"> <actRelationship typeCode="SUBJ"> <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <value xsi:type="CD" code="25064002|Headache|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Headache"/> </value> </observation>  </actRelationship> </act> </actRelationship> <actRelationship typeCode="COMP">  <act classCode="CONCERN" moodCode="EVN"> <actRelationship typeCode="SUBJ"> <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <value xsi:type="CD" code="239873007|Osteoarthritis of knee|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Osteoarthritis of knee"/> </value> </observation> </actRelationship> </act> </actRelationship></act> |

That a given clinical statement is a part of a condition tracking structure can be asserted by containing the clinical statement within the concern act, using the mechanism defined by the HL7 Patient Care Technical Committee, as shown here.

 3.5 Family History

As noted above (see section 2.2.5 Participations), the HL7 "subject" participant overlaps in meaning with the SNOMED CT Subject Relationship Context.

Where a family member has a condition, regardless of whether the observation code contains an explicit Subject Relationship Context, the subject of the observation is the family member, and not the patient. Where the observation code does include an explicit Subject Relationship Context, the subject participant can also be used where needed to provide further information about the subject.

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| Example 19. Family history, with explicit Subject Relationship Context |
| <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <text>Family history of cancer in father</text> <value xsi:type="CD" code="275937001|Family history of cancer|:408732007|Subject relationship context|=9947008|Biological father|" codeSystem="2.16.840.1.113883.6.96"/></observation> |

This observation uses an explicit SNOMED CT Subject relationship context attribute to represent the fact that the subject of the observation is the father.

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| Example 20. Family history, without explicit Subject Relationship Context |
| <observation classCode="OBS" moodCode="EVN"> <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/> <text>Family history of cancer in father</text> <value xsi:type="CD" code="363346000|Cancer|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Cancer"/> </value> <subject typeCode="SBJ"> <relatedEntity classCode="PRS"> <code code="9947008|Biological father|" codeSystem="2.16.840.1.113883.6.96"> <displayName="Biological father"/> </code> </relatedEntity> </subject></observation>  |

This example is equivalent to the preceding example, using the subject participant rather than the SNOMED CT Subject relationship context attribute to represent the fact that the subject of the observation is the father.

 3.6 Medications and Immunizations

Areas of overlap between HL7 and SNOMED CT include the source of information, as described above (see 3.1.3 Source of information). This is particularly important for medications, where one needs to differentiate what a patient is actually having administered vs. what is being dispensed. The former is typically gleaned from the patient, family member, or the medication administration record for an inpatient. The latter is often gleaned from a pharmacy application.

Another area of overlap between HL7 and SNOMED CT includes the method and route by which a substance is administered. Various ways by which this information can be represented include:

* SNOMED CT defining attributes (whether pre- or post-coordinated)
	+ [ 260686004 | Procedure method ]: Used to indicate the method by which a procedure is performed.
	+ [ 410675002 | Route of administration ]: Used to indicate the route by which a substance is administered.
* RIM attributes
	+ SubstanceAdministration.code: A code further describing the type of administration.
	+ SubstanceAdministration.routeCode: The method of introducing the therapeutic material into or onto the subject.

The following patterns post-coordinate within SubstanceAdministration.code to represent the route of administration. Within a particular realm, or as required by a particular implementation, there may also be a need to populate SubstanceAdministration.routeCode, possibly with values drawn from a required and non-SNOMED CT value set.

The level of detail by which an administered substance is known can vary greatly, particularly when dealing with patient recollection. SNOMED CT has both a [ 105590001 | Substance ] hierarchy and a [ 373873005 | Pharmaceutical / Biologic Product ] hierarchy, and may have realm-specific drug extensions that include manufacturer-specific product codes. Concepts from the Substance hierarchy **SHOULD NOT** be used to code an administered substance.

In the following examples, the pharmacy is dispensing atenolol 50mg tablets with instructions to take one tablet per day, whereas the patient's daughter says that only a half-tablet per day is being ingested.

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| Example 21. Pharmacy: Atenolol 50mg tablet, take 1 per day. |
| <substanceAdministration classCode="SBADM" moodCode="INT"> <code code="432102000|Administration of therapeutic substance|:410675002|Route of administration|=26643006|Oral route|" codeSystem="2.16.840.1.113883.6.96"/> <text>Atenolol 50mg tablet, take 1 per day</text> <effectiveTime xsi:type="PIVL\_TS"> <period value="24" unit="h"/> </effectiveTime> <doseQuantity value="1"/> <consumable typeCode="CSM"> <manufacturedProduct classCode="MANU"> <manufacturedLabeledDrug classCode="MMAT" determinerCode="KIND"> <code code="318420003|Atenolol 50mg tablet|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Atenolol 50mg tablet"/> </code> </manufacturedLabeledDrug> </manufacturedProduct> </consumable> <actRelationship typeCode="XCRPT" contextConductionInd="false"> <actReference classCode="SBADM" moodCode="EVN"> <id root="b3440e50-8f48-11da-a72b-0800200c9a66"/> </actReference> </actRelationship></substanceAdministration> |

This act represents an excerpt from a pharmacy application.

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| Example 22. Informant: Atenolol 50mg tablet, taking 1/2 per day. |
| <substanceAdministration classCode="SBADM" moodCode="EVN"> <code code="432102000|Administration of therapeutic substance|:410675002|Route of administration|=26643006|Oral route|" codeSystem="2.16.840.1.113883.6.96"/> <text>Atenolol 50mg tablet, taking 1/2 per day</text> <effectiveTime xsi:type="PIVL\_TS"> <period value="24" unit="h"/> </effectiveTime> <doseQuantity value="0.5"/> <consumable typeCode="CSM"> <manufacturedProduct classCode="MANU"> <manufacturedLabeledDrug classCode="MMAT" determinerCode="KIND"> <code code="318420003|Atenolol 50mg tablet|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Atenolol 50mg tablet"/> </code> </manufacturedLabeledDrug> </manufacturedProduct> </consumable> <informant typeCode="INF"> <relatedEntity classCode="PRS"> <code code="66089001|Daughter|" codeSystem="2.16.840.1.113883.6.96"> <displayName value="Daughter"/> </code> </relatedEntity> </informant></substanceAdministration> |

This act represents information gleaned from the patient's daughter.