LOINC Class Parts as Categories

Swapna Abhyankar, MD
Interim Director of Content Development & Operations
Background

• LOINC terms have a Class attribute that is used to organize/categorize terms
• The term to Class relationship is 1:1
• Historically, an entire set of terms would be assigned to the same Class, even if some didn’t quite fit (e.g., demographic terms in survey Classes)
Issues

• Users may not be able to find and/or aggregate the terms they need if searching by Class

• In many cases, an individual term could be categorized in different ways
  • Troponin – chemistry and cardiology
  • Hip x-ray - radiology, orthopedics, rheumatology, trauma...

• HL7 FHIR R4 has a Category resource element in the Observation resource
  • We’ve had discussions with the HL7 Structured Documents, Argonaut project, and others, about the possibility of using LOINC Class Parts to populate this instance-level element
# Resource Content

## Structure

<table>
<thead>
<tr>
<th>Name</th>
<th>Flags</th>
<th>Card.</th>
<th>Type</th>
<th>Description &amp; Constraints</th>
</tr>
</thead>
</table>
| Observation|       |       | DomainResource    | Measurements and simple assertions  
+ Rule: dataAbsentReason SHALL only be present if Observation.value[x] is not present  
+ Rule: If Observation.code is the same as an Observation.component.code then the value element associated with the code SHALL NOT be present  
Elements defined in Ancestors: id, meta, implicitRules, language, text, contained, extension, modifierExtension |
| identifier |       | 0..*  | Identifier        | Fullfills plan, proposal or order                                                         |
| basedOn    |       | 0..*  | Reference(CarePlan | DeviceRequest | ImmunizationRecommendation | MedicationRequest | NutritionOrder | ServiceRequest) |
| partOf     |       | 0..*  | Reference(MedicationAdministration | MedicationDispense | MedicationStatement | Procedure | Immunization | ImagingStudy) |
| status     |       | 1..1  | code              | registered | preliminary | final | amended +  
ObservationStatus (Required)  
Classification of type of observation  
Observation Category Codes (Preferred)  
LOINC Codes (Example) |
| category   |       | 0..*  | CodeableConcept   | Classification of type of observation                                                    |
| code       |       | 1..1  | CodeableConcept   | Type of observation (code / type)                                                         |
| subject    |       | 0..1  | Reference(Patient | Group | Device | Location) |
| focus      |       | 0..*  | Reference(Any)    | What the observation is about, when it is not about the subject of |
Goal & Strategy

• To use LOINC Parts to categorize individual LOINC codes in different ways

• This would allow:
  • Improved ability to find terms across Classes; and
  • Aggregation of data for viewing (e.g., in a single tab of an EHR record)

• The use of LOINC Class Parts seems like an ideal choice because they are:
  • Already used to classify sets of terms; and
  • Are used in the Multiaxial hierarchy as upper-level nodes
Two pathways

• Semi-automated category assignment
  • Assigned by 3M (thank you!) based on an algorithm used inside the HDD
  • Many terms assigned multiple categories
  • Nearly half of all LOINCs assigned at least one category
  • Categories will be assigned to terms as ancillary data in the internal LOINC database, where the category is a LOINC Part

• Multiaxial hierarchy
  • In the June release, we updated many of the high-level nodes in the hierarchy to Class type Parts (rather than multi-axial Parts)
  • For each term, we have designed a mechanism to link each Class Part that represents an ancestor node with link type Category to that term
3M Categories

- Administrative
- Allergy/Immunology
- Cardiology
- Gastroenterology
- Endocrinology
- Ophthalmology
- Infectious Disease
- Oncology
- Hematology
- Pulmonology
- Obstetrics/Gynecology
- Ultrasonography
- Dental
- Neurology
- Radiology
- Orthopedics
- Genetics
- Hepatology
- Urology
- Nephrology
- Dermatology
- Rheumatology
- Audiology
- Psychiatry/Mental and Behavioral Health
- Skilled Nursing
- Occupational Therapy
- Physical Therapy
- Speech Therapy
- Otolaryngology
- Dietetics
One destination

• LoincPartLink file
  • Enhanced model of term to Part linkages published in June 2019
  • Several different LinkTypes, including Primary, Detailed model, Semantic enhancement, Search, Metadata

• Class Parts will be assigned to a LOINC term with Link type of Metadata, Property Category

• Each term’s existing Class attribute value will also be assigned to that term with Link type of Metadata, Property Class
Path #1

- Through the LoincAncillaryData table - categories assigned to terms across Classes
Path #2

- Multiaxial hierarchy – all Class ancestor nodes assigned as categories to each term
Current status

• We are reviewing the 3M Categories; at least some will be added as ancillary data for the December release

• All of the Class Parts that are ancestor nodes in the Multiaxial hierarchy will be included as categories in the December release
  • Mostly the highest-level nodes
  • Future work – review lower-level nodes to see which ones might be appropriate to change to Class type Parts
Discussion

- How will people use this?
- What Categories would be useful?