

Representing a Lab Result –Developing a LOINC Reference Table for a Distributed Research Network

Michelle Smerek, Shelley Rusincovitch, and Keith Marsolo, PhD

Introduction

The National Patient-Centered Clinical Research Network (PCORnet) was created by The Patient-Centered Outcomes Research Institute (PCORI) as a “network of networks,” serving as a national infrastructure for research. Queries/analytic programs are sent to data partners, who maintain local possession and control of their data. Data partners map local data to the PCORnet Common Data Model (CDM), which enables interoperability across the network via standardized representations of multiple data domains. The PCORnet CDM laboratory results table includes 11 common laboratory tests (CLTs), to which local data are mapped. The CDM also allows data partners to include LOINC (Logical Observation Identifiers Names and Codes) values along with their laboratory results. Diagnosis codes, have long been standardized for billing purposes, however clinical laboratory results are notorious for their heterogeneity. For many data partners, PCORnet was one of the first large-scale drivers for the assignment of LOINC codes to laboratory results. Unlike classification hierarchies like the International Classification of Disease (ICD), in which a single diagnosis is represented by one code, a laboratory result could be represented by several “correct” choices. PCORnet data partners asked the PCORnet Distributed Research Network Operations Center (DRNOC) for a reference table that would help them determine whether the LOINC codes they assigned for the 11 CLTs were appropriate.

Methods

The first version of the CLT – LOINC reference table included example LOINC codes corresponding to the 11 CLTs, with a statement that the table was not intended to be a complete resource. The DRNOC expanded the table via the following process:

- Review content of existing CLT – LOINC reference table (to determine conceptual scope for each CLT in the CDM)
- Review LOINC Top 2000+ list and associated documentation
- Review LOINC tutorials online
- Attend LOINC Community workshop (confer with LOINC experts on Regenstrief LOINC Mapping Assistant (RELMA®) best practices)
- Utilize RELMA® to search for LOINC codes that correspond to the 11 CLTs

Findings

Utilizing the steps outlined above, a more complete CLT – LOINC mapping table was created. An additional 59 codes were added, with each CLT having between 2 and 35 codes.

Conclusion

While a more complete listing of LOINC codes was created, it does not address all the nuance associated with the secondary use of laboratory data. Much as investigators had to learn which ICD codes to use when identifying patients who were treated for a particular condition, they will need to similarly understand which LOINC code(s) to choose to represent which laboratory test(s).

Lessons Learned

These data are dynamic in nature; as new laboratory tests are developed, and existing test methods are clarified, LOINC codes are created and deprecated. Consequently, upstream LOINC assignment (e.g., reference

labs/instrument manufacturers) might be more optimal. While a more complete reference table was created, the LOINC codes that correspond to a categorical name (e.g., “hemoglobin”) will depend on the intended analytical purpose of the data. Therefore, the reference table can be used as a general guide for mapping, but selecting the appropriate LOINC codes for specific analytical purposes needs to be done on a case-by-case basis.