

Correlating Unrelated Test Catalogs using Vocabulary Standards

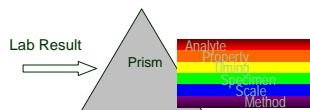
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Introduction

The study examines the effectiveness of the vocabulary standard LOINC® (Logical Observation Identifiers Names and Codes) in harmonizing laboratory test catalogs from separate hospitals. Laboratory test codes from different sites don't correlate in mnemonic. Comparison between hospitals' data is impossible without translation.

Intent of LOINC® - definition by attributes



Glucose, CSF mg/dL 2342-4 Glucose:MCnc:Pt:CSF:Qn:

Materials and Methods

- Five hospitals volunteered in a prototype health information exchange.
- Each site extracted a spreadsheet from their laboratory information system, listing their order mnemonic, order display, specimen type, component result code, component result display, and unit of measure.
- The LOINC® standard analyzes one laboratory assay by up to six attributes: component, property, timing, specimen, scale and method¹.
- The result codes were translated to LOINC® by trained medical laboratory staff, with local subject matter experts.
- Manual peer review took place for inter-rater agreement.

Site	# of Lab assays
Hospital A	1492
Hospital B	2476
Hospital C	1473
Hospital D	1512
Hospital E /Regional Reference Lab	7849
Total Lab Assays	14802

Site	Code	Display	Units
A	5300130	AST	U/L
A	5300035	NA	MEQ/L
A	5300015	GLUC	MG/DL
B	1001660	AST	Int_Unit/L
B	1001700	NA	mEq/L
B	1000920	GLU	mg/dL
C	AST	AST (SGOT)	U/L
C	NA	SODIUM	mmol/L
C	GLUC	GLUCOSE	mg/dL
D	AST/SGO	AST/SGO	U/L
D	NA	NA	mmol/L
D	GLU	GLU	mg/dl
E	3450-72	AST	U/L
E	5409-72	SODIUM	mEq/L
E	1344-72	GLUCOSE	mg/dL

Results

1. Similarities Identified

14,802 lab assays consolidated to 4,051 unique assay identifications; 25% had 3 or more associations

Assay Comparison	Unique Concept	Percentage
>= 3 interface codes mapped	1026	25%
Two interface codes	929	23%
One interface code	2096	52%
	4051	100%

2. Disparities Identified - similar name but not identical assay

Lab Name	LOINC®	Reason to not store together
Lyme Disease Antibody	6321-4	<IgM by Western blot>
Lyme Disease Serology	22103-9	<IgG titer>

3. Repository could identify similar concepts from different labs for storage and trending without human intervention

BEFORE		
Mnemonic	Patient Value	Units
1001280	140	mmol/L
1001660	140	mg/dL
1001680	140	U/L
1001700	140	Unit/L
750012	140	IU/L
1344-72	140	mg/dL
3450-72	140	U/L
4498-72	140	Unit/L
5409-72	140	mEq/L
0569-72	140	IU/L



AFTER			
LOINC® Code	LOINC® short name	Patient Value	Units
2951-2	Sodium SerPI-sCnc	140	mmol/L
2345-7	Glucose SerPI-mCnc	140	mg/dL
1742-6	ALT SerPI-cCnc	140	U/L
1920-8	AST SerPI-cCnc	140	Unit/L
3040-3	Lipase SerPI-cCnc	140	IU/L
2345-7	Glucose SerPI-mCnc	140	mg/dL
1920-8	AST SerPI-cCnc	140	U/L
1742-6	ALT SerPI-cCnc	140	Unit/L
2951-2	Sodium SerPI-sCnc	140	mEq/L
3040-3	Lipase SerPI-cCnc	140	IU/L

Results (cont'd)

4. Test catalogs typically contain 15% non-patient lab tests that will not translate to a standard codeset. If a result field does not chart for a patient, there is no need for a LOINC® code.

- Quality control reminders
- Instrument/bench housekeeping procedures
- Customer service / patient relations issues
- Internal lab processing instructions

Conclusions

- The application of LOINC® to test catalogs was equally adept at identifying similar lab tests with different display names and disparate assays with similar names.
- As laboratory data incorporates into electronic health records, there will be increased demands on comparable applicability with other systems.²
- LOINC® correlation provides internationally standardized identification for computerized use of data in repositories and health information exchanges.³
- Secondary uses of standardized patient data include:
 - Pubic Health
 - Payers / HEDIS
 - Quality Corporations
 - Clinical Trials
 - Disease Registries

References

1. Regenstrief Institute. LOINC® User's Guide, January 2009
2. Malone, B. The Health IT Revolution: Are Labs Ready to Adapt to EHRs? *Clinical Laboratory News*, April 2009. Volume 35; 4:1
3. Banning, P. Economic Recovery Plan to Include Health Info. *Medical Laboratory Observer, Washington Report*. February 2009 p.48.

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