

LOINC

An introduction to LOINC

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INDIANA UNIVERSITY

DEPARTMENT OF MEDICINE
School of Medicine



Regenstrief Institute
Medical Informatics

Overview

- 
- 1. Origins and Evolution of LOINC**
 - 2. LOINC Introduction**
 - 3. Mapping Tools and Resources**
 - 4. Closing Thoughts**



Regenstrief Institute

established 1969

Biomedical Informatics

Health Services Research

Aging Research



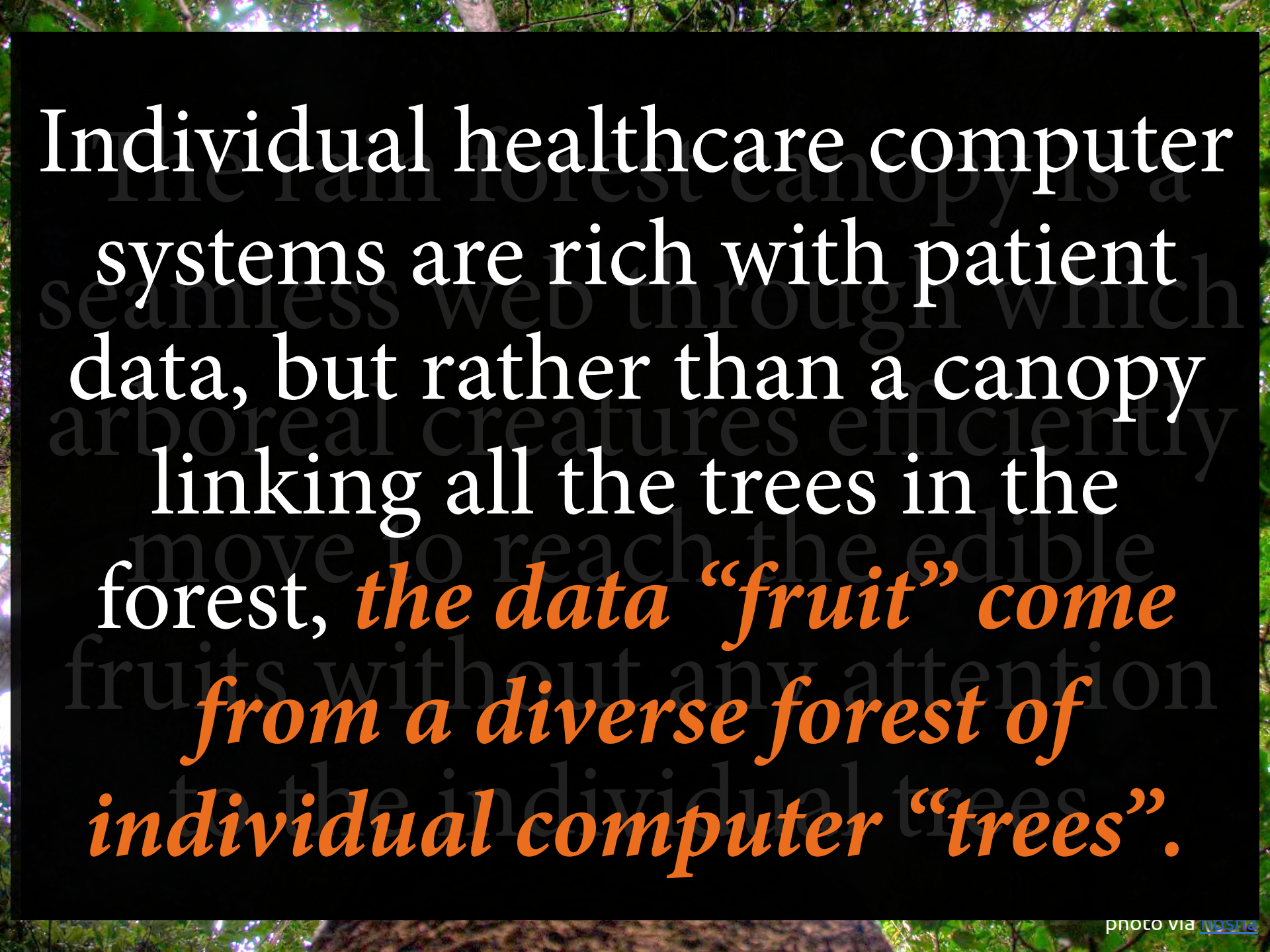
Biomedical Informatics at Regenstrief Institute

Building data-rich systems for clinicians



40+ Years of Canopy Computing

making a forest out of individual trees of data



Individual healthcare computer systems are rich with patient data, but rather than a canopy linking all the trees in the forest, *the data “fruit” come from a diverse forest of individual computer “trees”.*



Regenstrief Biomedical Informatics

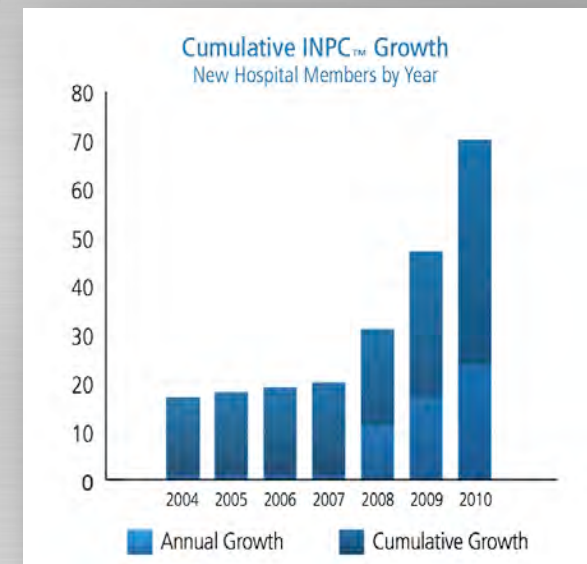
40 years of EMR work

Indiana Network for Patient Care

Nation's *most comprehensive* and *longest tenured* HIE

Regenstrief

– the neutral 3rd party convener



A “Humongous” Database

200+ source systems

12.1 million patients

4.1 billion results

79.4 million text reports

1 million transactions per day

Indiana Network for Patient Care



Referral Labs, RxHub,
etc...



St. Vincent



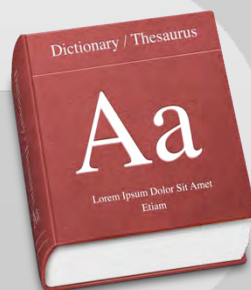
IUMG



St. Francis



**Global Patient
Index**



**Concept
Dictionary**



**Global Provider
Index**



Public Health



IU Health



Wishard Health



Community

A Unified Patient Record

CareWeb04-Jan-2010 13:23 EST

TRIAL, PAT PT #9993@WISHARD (F) Age: 27 yrs
[Select a patient](#)View registrationsChange passwordLogout

External Resources ▾ Help ▾

Browse Patient Record Settings

Select an Option:
Flowsheet
Clinical Abstract
All Reports
Encounters
Pharmacy Orders
Chronological Results

< - Page 1 - >

No Search Filters ▾ Last Two Years ▾ No Thinning ▾

Graph Print

VITALS CLINIC	18-Dec-2009 09:00	25-Nov-2009 12:07	12-Aug-2009 09:46	18-Feb-2009 16:26	29-Oct-2008 10:51	Ref Range / Units
<input type="checkbox"/> Heart Rate			72 ♀			60-100 /MIN
<input type="checkbox"/> BP Sys Sitting	130 ♀	120 ♀	118 ♀			100-160 mm Hg
<input type="checkbox"/> BP Dias Sitting	80 ♀	80 ♀	74 ♀			60-90 mm Hg
<input type="checkbox"/> Height(In)	65 ♀		62 ♀	62 ♀	68 ♀	0-96 INCH(S)
<input type="checkbox"/> Weight Lbs	130 ♀		205 *H ♀			50-200 LBS
<input type="checkbox"/> Weight Metric		95 ♀			69 ♀	KG

VITALS HOSP	18-Dec-2009 09:00	25-Nov-2009 12:07
<input type="checkbox"/> Occult Blood Ur	neg ♀	positive ♀

URN CHEMISTRY	18-Dec-2009 09:00	Ref Range / Units
<input type="checkbox"/> pH Timed Ur	8.0 ♀	0-14

U-A	18-Dec-2009 09:00	25-Nov-2009 12:07	29-Oct-2009 09:45	Ref Range / Units
<input type="checkbox"/> Specific Gravity Bedside	1.016 ♀			
<input type="checkbox"/> Protein UA SQ	30 mg/dl ♀	trace ♀		mg/dL
<input type="checkbox"/> Glucose-UA(POC)			50 mg/dl ♀	
<input type="checkbox"/> Glucose-UA SQ	trace ♀	trace ♀		mg/dL
<input type="checkbox"/> Ketone-UA(POC)			1+ ♀	
<input type="checkbox"/> Ketones-UA QL	neg ♀			
<input type="checkbox"/> Bilirubin-UA (POC)	negative ♀	1+ ♀	negative ♀	
<input type="checkbox"/> Nitrite UA QL	neg ♀	positive ♀		
<input type="checkbox"/> Urobil-UA(POC)	normal ♀			0.1-1.0
<input type="checkbox"/> WBC UA Dipstick	negative ♀	large ♀		

CARDIOPULMONARY SX&FINDINGS	18-Dec-2009 09:00	25-Nov-2009 12:07
<input type="checkbox"/> Edema Periph	0 **L ♀	2 ♀

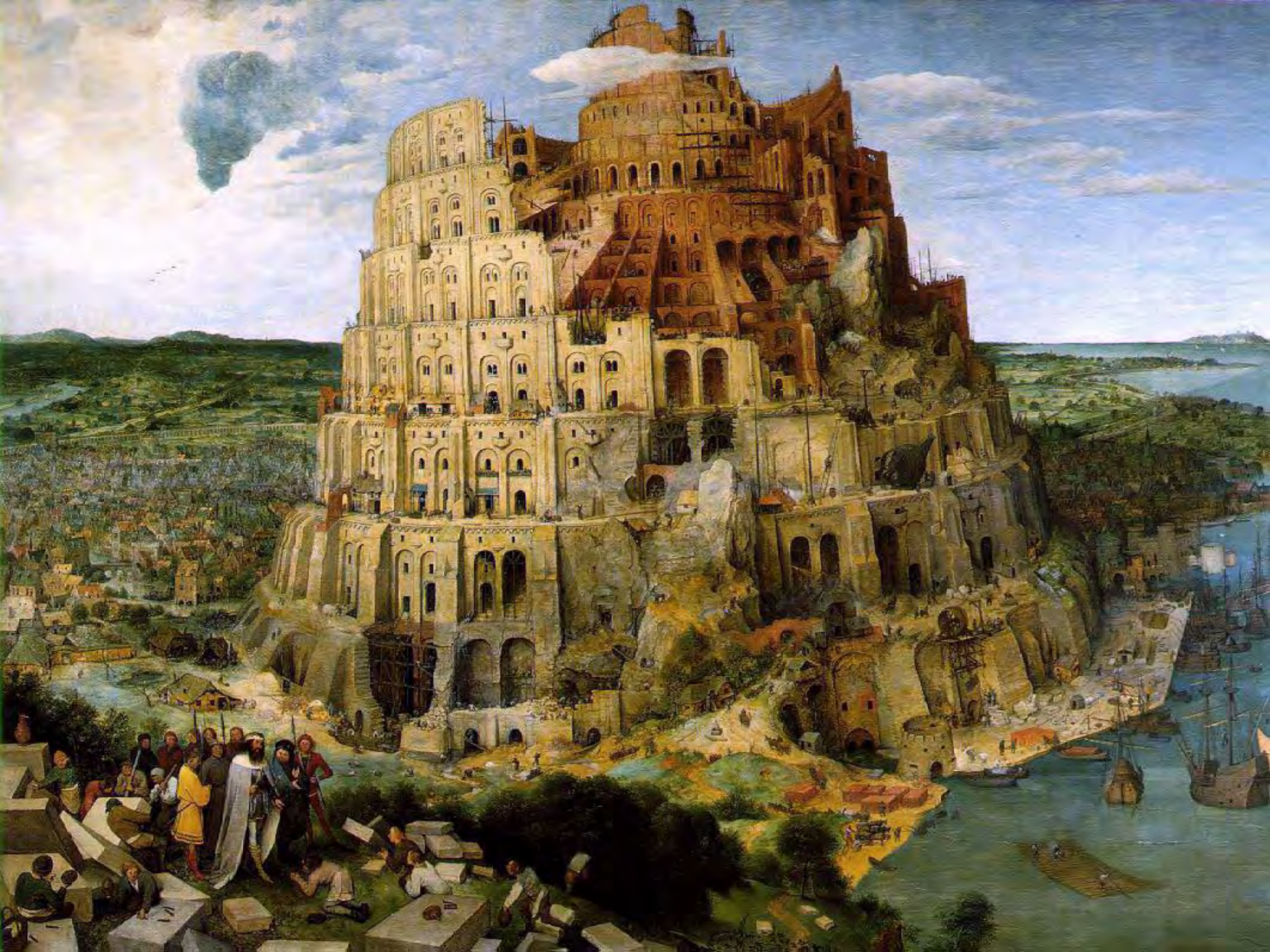
clinic data	30-Nov-2009 13:42	30-Nov-2009 13:32	30-Nov-2009 13:30	25-Nov-2009 12:09	25-Nov-2009 12:03	12-Nov-2009 20:57
<input type="checkbox"/> Encounter Site	ERAT ♀	ERAT ♀	ERAT ♀	WVC_OUTPAT ♀	WVC_OUTPAT ♀	SR_HOUSE_CALLS ♀



Origins of LOINC

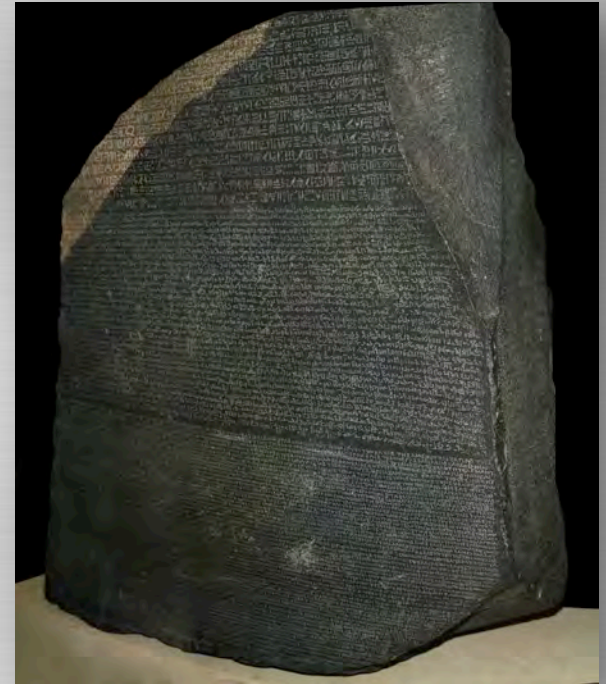
The lingua franca of clinical observation exchange





Fundamental challenge:
*local systems have different
ways of identifying the
same concept*

A vocabulary standard
would serve as the
Rosetta Stone.



Logical Observation Identifiers Names and Codes

A universal code system that facilitates exchange, pooling, and processing of results

Established in 1994 by
Regenstrief Institute.

Vocabulary standard for
observation identifiers.



Same or Different?

what you see in the order list

```
graph TD; A[what you see in the order list] --> B[Lab A]; A --> C[Lab B]; B --> D[LOINC Code = 5062-5]; C --> E[LOINC Code = 6321-4];
```

Lab A

Test Name: Lyme Disease Serology

Measures: *B. burgdorferi* Ab IgG

Method: ELISA

Scale: quantitative

e.g.: Titer 1:40

LOINC Code = 5062-5

Lab B

Test Name: Lyme Disease Antibody

Measures: *B. burgdorferi* Ab IgM

Method: Immune blot

Scale: qualitative

e.g.: Positive

LOINC Code = 6321-4

Similar name, different meaning...



photo via [Caption Time](#)

meerkat meerkat *mere cat* meerkat

*If an observation is a question
and the observation value is
an answer...*

**LOINC provides codes for
*questions***

**Other vocabularies provide
codes for the *answers***

**What is my patient's
hemoglobin level?**

718-7:Hemoglobin:MCnc:Pt:Bld:Qn



How fast does my patient usually walk?

41959-8:Walking speed:Vel:1W^mean:^Patient:Qn:Calculated

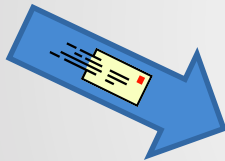
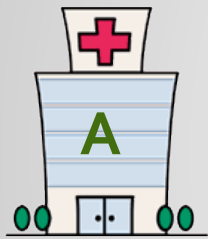


Indiana Network for Patient Care

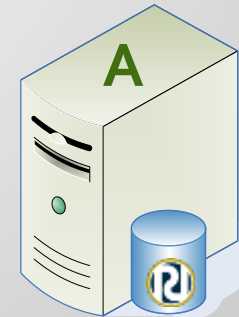
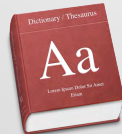
HL7 v.2.X Message

LocalCode^LocalName^CodeSystem **LOINCcode^LOINCname^CodeSystem**

OBX|2|NM|123^WBC^HSP_A^26464-8^Leukocytes [#/volume] in Blood^LN|10.8|K/MM3|||F|
OBX|3|NM|234^RBC^HSP_A^26453-1^Erythrocytes [#/volume] in Blood^LN|4.82|MIL/MM3|||F|
OBX|4|NM|345^HGB^HSP_A^718-7^Hemoglobin [Mass/volume] in Blood^LN|15.7|GM/DL|||F|
OBX|5|NM|456^HCT^HSP_A^20570-8^Hematocrit [Volume Fraction] of Blood^LN|45%|||F|



Message Processor



Institutional Repository

Result with a Coded Value

Data type of result (OBX-5) is a coded element

This code is from LOINC

This code is from SNOMED

OBX||CE|6609-2^Listeria ID^LN||36094007^L. monocytogenes^SCT

Code identifying this observation
(what are these results?
Listeria culture)

Code identifying the
result (L. monocytogenes)

Laboratory LOINC

Microbiology Tests

Chemistry non challenge tests

Challenge chemistry tests

Allergy Testing
Serology tests

Antibiotic Susceptibilities

Cephalosporin Tests
Cell Markers
Mutations

Hematology / Cell counts

Microbial Bank Tests

Drug toxicology tests

non micro

Clinical LOINC

Radiology Studies

Patient Reported Outcomes Information System

Outcome and Assessment Information Set

OB Ultrasound impression and Measures

Dental
Measurements

Minimum Data Set

Respiratory measures and ventilator management
Clinical Report Document

Physical Exam sections and measures

OMAHA

Cardiac Ultrasound

History categories

survey

Tumor Registry

Continuity Assessment Record and Evaluation

Quality of Life Outcomes in Neurological Disorders

NAACCR

PhenX

Laboratory LOINC Committee Chair:

Clem McDonald, MD



Clinical LOINC Committee Chair:

Stan Huff, MD



The background of the slide is a repeating pattern of interlocking puzzle pieces in a light gray color. The pieces are arranged in a grid-like fashion, creating a textured, three-dimensional effect.

How LOINC fits with other terminology standards

Different standards for different domains



SNOMED CT

Systematized Nomenclature of Medicine - Clinical Terms



International Classification of Diseases (ICD)

and the rest of the family



RxNorm

normalized names for clinical drugs

The LOINC Community

Open. Nimble. Pragmatic.

Open Development

Worldwide distribution at no cost

End-user content additions

Welcome all comers

Volunteers



Funding Support

Principal current sources are:

U.S. National Library of Medicine
Regenstrief Foundation

Prior support from

Several other U.S. federal agencies,
John A. Hartford Foundation

Regenstrief Institute

Steward

Developer of content

Developer of tools

Developer of community

Distributor

Voice



Logical Observation Identifiers Names and Codes (LOINC®)




A universal code system for identifying laboratory and clinical observations.

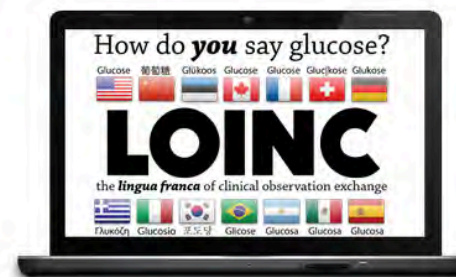
From serum levels of hepatitis B surface antigen to diastolic blood pressure, LOINC has standardized terms for all kinds of observations and measurements that **enable exchange and aggregation of electronic health data from many independent systems.**

More than 14,000 people in 145 countries use LOINC to help make bridges across their islands of health data.

It's free, but invaluable. Both [LOINC](#) and the [RELMA](#) mapping program that helps link your local codes to LOINC terms are **distributed at no cost** by the [Regenstrief Institute](#). LOINC is your key to interoperable data exchange.

Ready to get started?

Or, search LOINC with our online app 



Learn LOINC

[Background](#)
[FAQ](#)
[Users Guide](#)
[Presentations/Tutorials](#)

Use LOINC

[Download LOINC](#)
[Map to LOINC](#)
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Get Involved

[Forum](#)
[Meetings](#)
[Mailing Lists](#)
[Directory of Adopters](#)

Develop LOINC

[Submit Term Requests](#)
[What's Coming](#)
[Translate LOINC](#)

Current Versions

LOINC 2.38

Released: 2011-12-30

RELMA 5.5

Released: 2011-12-30

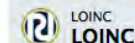
[Download Now](#)

Recent Forum Posts

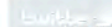
Microbiology | Re:
Microbiology Text results
and LOINC

Microbiology | Re: Organism
Names and LOINC?

[More posts...](#)



LOINC New paper
published in JBI about
helping map to #LOINC
with RELMA by
augmenting local test
names <http://t.co/plwkalfm>
about 1 hour ago · reply · retweet · favorite



[Join the conversation](#)



Copyright © 1994–2012 by the Regenstrief Institute, Inc.
Read the full [LOINC®](#) and [RELMA®](#) Terms of Use
loinc.org stats: 14697 users from 145 countries

Downloads

[LOINC](#)
[RELMA](#)
[Accessory Files](#)

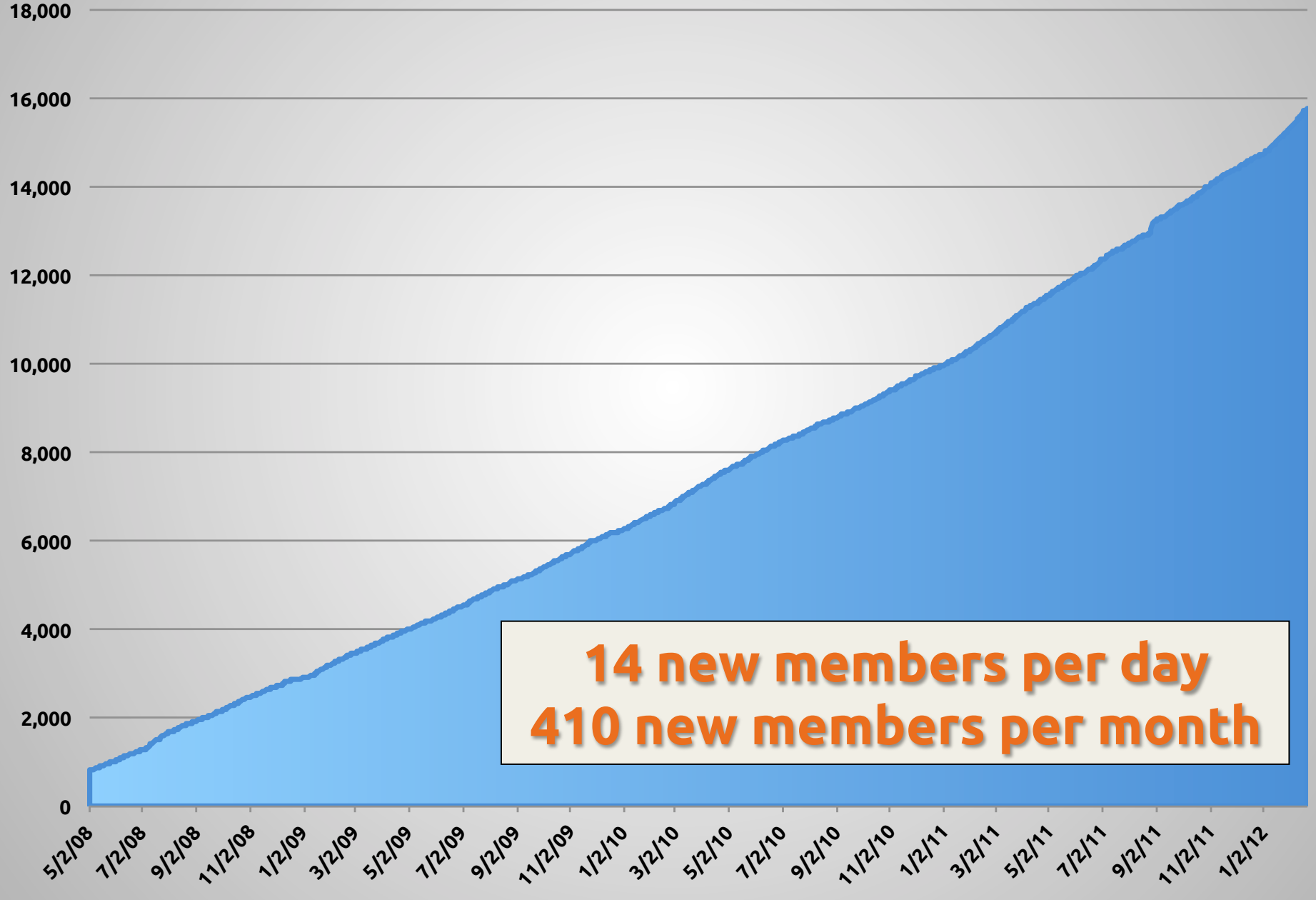
Content

[LOINC Usage Value Sets](#)
[Newborn Screening](#)
[Document Ontology](#)

Documentation

[LOINC Users' Guide](#)
[Recommended Readings](#)
[Presentations/Tutorials](#)

loinc.org members



15,800+ users in 145 countries



The LOINC Distribution

LOINC and RELMA Complete Package



Download Now (free)

LOINC and RELMA Complete Package



[LOINC and RELMA Complete Download File \(All Formats Included\)](#) (216.1 MB)

File Version: LOINC 2.34 and RELMA 5.1 | Release Date: 2011-02-17 | File type: application/zip

This file contains the RELMA® program installer (which also includes the LOINC® and RELMA® Users' Guides), and the LOINC® database in both MS Access™ and tab-delimited formats.

To download this file you need to log in with your user name and password. If you do not have an account here, head over to the [registration form](#).

LOINC Table



LOINC 2.34

Released: 2010-12-29

The LOINC table with fields for LOINC codes, each of the six parts of the formal name of the LOINC, synonyms, comments, and other information. Distributed as a tab-delimited file and Access database, and a release to release change file. Documentation includes [LOINC Release Notes](#) and a the comprehensive [LOINC User's Guide](#).

Download Now (free)



Accessory Files



LOINC 2.34

Released: 2010-12-29

Additional files available in the LOINC distribution.

- [LOINC Panels and Forms File](#)
- [LOINC Multiaxial Hierarchy File](#)
- [LOINC Context-specific Hierarchy Template File](#)

Download Now (free)



RELMA



RELMA 5.1

Released: 2011-02-17

Regenstrief LOINC Mapping Assistant (RELMA®) is a Windows program for searching the LOINC database and helping you map local codes to LOINC codes.

Documentation includes [RELMA Release Notes](#) and a comprehensive [RELMA User's Manual](#).

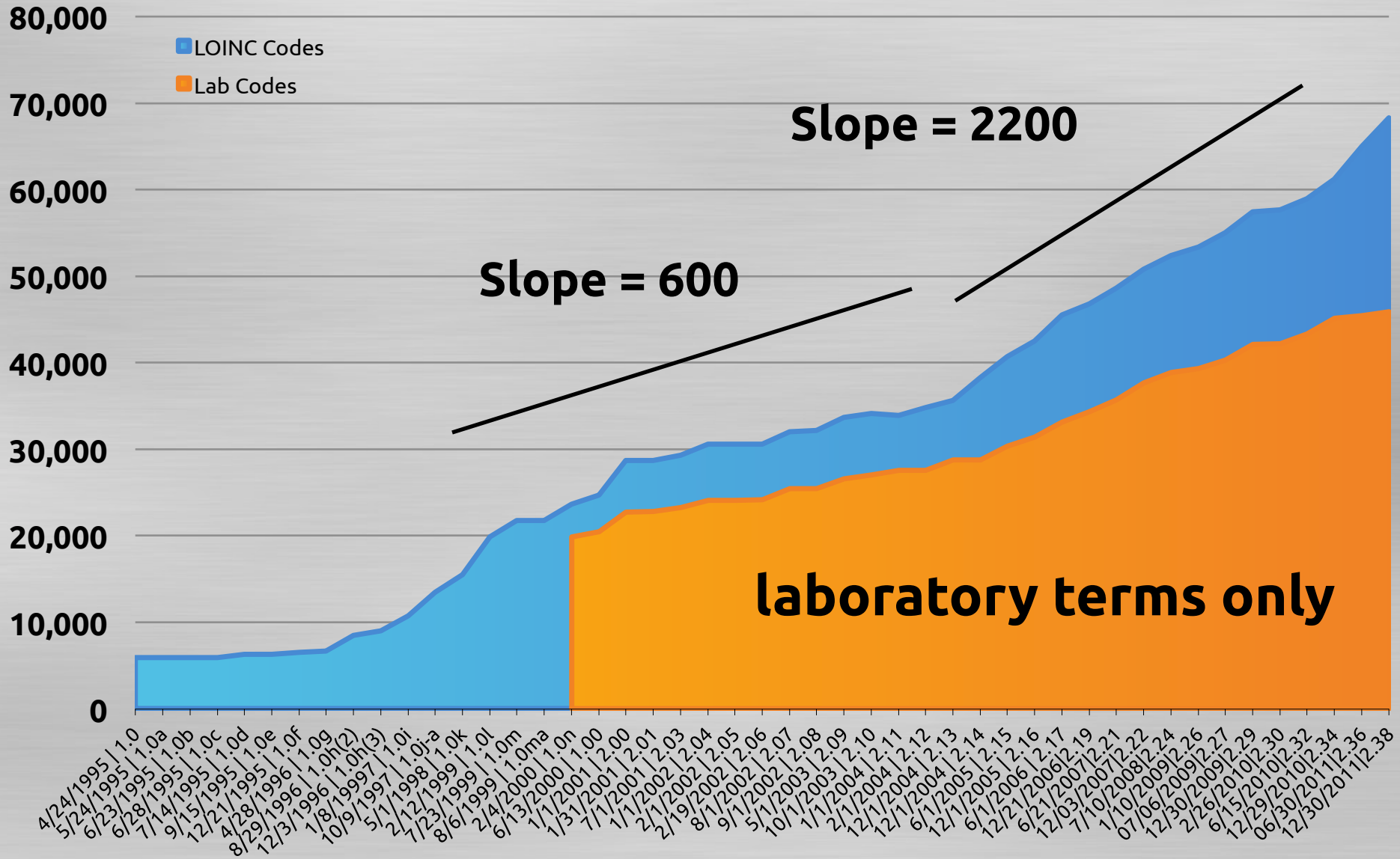
Download Now (free)





**Major releases
twice per year
(June and December)**

LOINC Codes Over Time By Release



A photograph of a chef in a white toque and striped shirt, focused on cooking. A large, intense flame is erupting from a pan on the stove. The chef is holding a metal strainer over the pan. The background shows a typical kitchen environment with shelves and various cooking items.

Lots Cooking...

Always more lab tests

Genetic reporting

Flow cytometry

Lots of survey instruments, forms, and assessments

More radiology reports

Structured document titles

...

loinc.org/terms-of-use



**No cost
Worldwide
In perpetuity**

Use


Copy

Distribute



A hand is holding a very thick stack of US dollar bills, likely \$100 bills, which are fanned out. A single bill is visible at the bottom of the stack, showing the number 'AF 71735'. The background is a light-colored, textured surface.

**Any purpose:
commercial
non-commercial**



Cannot use any
Licensed Material to
develop or promulgate
a different standard
for orders or
observations.

**That would defeat
the purpose of
having a standard!**



International Adoption

participation, translation, implementation

LOINC Submitters



Since 2009
79 organizations from 14 countries

LOINC Translators



Satellite

Traffic



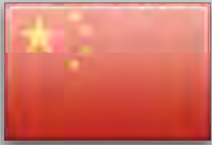
19 organizations

How do *you* say glucose?

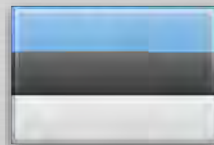
Glucose



葡萄糖



Glükoos



Glucose



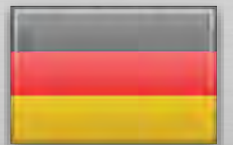
Glucose



Gluc|kose



Glukose



LOINC

the *lingua franca* of clinical observation exchange



Γλυκόζη



Glucosio



포도당



Glicose



Glucosa



Glucosa



Glucosa



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Journal of Biomedical Informatics

journal homepage: www.elsevier.com/locate/yjbin

Enabling international adoption of LOINC through translation

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ABSTRACT

Interoperable health information exchange depends on adoption of terminology standards, but international use of such standards can be challenging because of language differences between local concept names and the standard terminology. To address this important barrier, we describe the evolution of an efficient process for constructing translations of LOINC terms names, the foreign language functions in RELMA, and the current state of translations in LOINC. We also present the development of the Italian translation to illustrate how translation is enabling adoption in international contexts. We built a tool that finds the unique list of LOINC Parts that make up a given set of LOINC terms. This list enables translation of smaller pieces like the core component "hepatitis c virus" separately from all the suffixes that could appear with it, such as "AbJgC", "DNA", and "RNA". We built another tool that generates a translation of a full LOINC name from all of these atomic pieces. As of version 2.36 (June 2011), LOINC terms have been translated into nine languages from 15 linguistic variants other than its native English. The five largest linguistic variants have all used the Part-based translation mechanism. However, even with efficient tools and processes, translation of standard terminology is a complex undertaking. Two of the prominent linguistic challenges that translators have faced include: the approach to handling acronyms and abbreviations, and the differences in linguistic syntax (e.g. word order) between languages. LOINC's open and customizable approach has enabled many different groups to create translations that met their needs and matched their resources. Distributing the standard and its many language translations at no cost worldwide accelerates LOINC adoption globally, and is an important enabler of interoperable health information exchange.

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In-progress

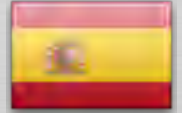
Catalan

Dutch

French

Russian

Turkish



Adopted as National Standard

Brazil

Canada

France

Germany

The Netherlands

Mexico

Rwanda





Large Implementations

SIGA Saúde project

Canada Health Infoway

ePSOS

Assistance publique - Hôpitaux de Paris

Red Agrolab

BiTAC

Many more...

HL7 and Regenstrief Institute Sign Statement of Understanding

November 14, 2011

INDIANAPOLIS -- Health Level Seven® (HL7®) International, the global authority on standards for interoperability of health information technology with members in 55 countries, and the Regenstrief Institute, Inc., an internationally respected healthcare and informatics research organization, today announced an agreement to create a complementary process to develop and extend comprehensive standards in the healthcare industry.

"This agreement further solidifies and extends the wonderful relationship HL7 has enjoyed with Regenstrief for many years," said Bob Dolin, chair of HL7 Board of Directors. "HL7 is committed to working with Regenstrief and other standards bodies to advance the delivery of safe and effective patient care."

Logical Observation Identifiers Names and Codes (LOINC®) is a universal code system developed by the Regenstrief Institute for identifying laboratory and clinical observations. When used in conjunction with the data exchange standards developed by HL7, LOINC's universal observation identifiers make it possible to combine test results, measurements, and other observations from many independent sources. Together, they facilitate exchange and pooling of health data for clinical care, research, outcomes management, and other purposes.

"Regenstrief has been a long-standing contributor to the standards developed by HL7, and likewise, LOINC has been enhanced by its adoption in HL7's standards," said Daniel Vreeman, DPT, M.Sc., associate director of terminology services at the Regenstrief Institute. "With this agreement, we look forward to an even closer collaboration with HL7 that improves the semantic interoperability of health data exchange worldwide."

LOINC began in the mid 1990's when Regenstrief investigators, using their decades of experience with electronic medical records, began the Indiana Network for Patient Care, the nation's first citywide health information exchange. The researcher clinicians found they could receive data from various INPC member institutions but that the clinical content was difficult to interpret because each used a different code for the same test or observation so it was like receiving messages in French, Spanish and Italian when all they could understand was English.


LOINC was born from the desire to develop a lingua franca. From the beginning it has been a free and open system, encouraging additions, comments and feedback. Two new versions of LOINC are issued annually, with more than 2,000 new terms for tests or clinical observations per release. These new additions are based on requests from end users.

Tagged with: [electronic medical records](#), [medical informatics](#), [Regenstrief](#)

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LOINC

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US Adoption

A few key highlights



US Federal Agencies

NLM

VA

DoD

IHS

NCI

CDC

EHR Incentive Program

a.k.a. *“Meaningful Use”*

Documents Using HL7 CCD Component
HITSP/C32 (incorporated by reference

in § 170.299

(2) *Standard.*

Specification

Record and

(incorporate

(b) *Electro*

Standard. T

Prescription

Prescriber/P

standard, In

Version 8, R

October 200

in § 170.299

(2) *Stand*

Standard, In

Version 10.6

in § 170.299

(c) *Electro*

results to pu

Standard. H

reference in § 170.299). *Implementation*

specifications. HL7 Version 2.5.1

Implementation Guide: Electronic

Laboratory Reporting to Public Health,

Release 1 (US Realm) (incorporated by

reference in § 170.299).

§ 170.207 Vocabulary standards for
representing electronic health information.

time, patient identification, and user
identification must be recorded when

(2) *Standard.* The code set specified at
45 CFR 162.1002(a)(5).

(c) *Laboratory test results. Standard.*
Logical Observation Identifiers Names
and Codes (LOINC®) version 2.27, when
such codes were received within an
electronic transaction from a laboratory
(incorporated by reference in § 170.299).

45 CFR 162.1002(a)(5).

(c) *Laboratory test results. Standard.*
Logical Observation Identifiers Names
and Codes (LOINC®) version 2.27, when
such codes were received within an
electronic transaction from a laboratory
(incorporated by reference in § 170.299).

disclosures for treatment, payment, and
health care operations, as these terms
are defined at 45 CFR 164.501.

§ 170.299 Incorporation by reference.

(a) Certain material is incorporated by
reference into this subpart with the

created,
and an
curred
ded.
health
l in
orithm
or
h
by the
nd
180–3
verify
n has
t, and
es. The
, user
of the

TABLE 5-12. OBSERVATION/RESULT SEGMENT (OBX)

Seq	Len	DT	Cardinality	Lab Result Sender Usage	ELR Receiver Usage	NHSN Receiver Usage	Lab to EHR Receiver Usage	Value Set	HL7 Element Name	Description/Comments
3		CWE	[1..1]	R	R	R	R	Laboratory Observation Identifier Value Set	Observation Identifier	<p>Unique identifier for the type of observation. This field provides a code for the type of observation. OBX-3 in conjunction with OBX-4 Observation Sub-ID should uniquely identify this OBX from all other OBXs associated with this OBR.</p> <p>LOINC is used as the coding system for this field except where the test being reported has no equivalent LOINC code. In this case, use of local codes is allowed. This should only occur for new tests that have yet been coded by LOINC.</p> <p>When populating this field with values, this guide does not give preference to the triplet in which the standard (LOINC) code should appear.</p> <p>Lab to EHR - LOINC® is an HL7 approved code system and shall be used for the Observation Identifier as described in the appropriate HITSP Interoperability Specification. Use of LOINC codes for additional tests is strongly encouraged.</p>
4	1..20=	ST	[0..1]	CE	CE	C	C		Observation Sub-ID	Harmonized condition predicate: Required if there is more than one OBX with the same OBX-3 Observation Identifier associated with the same OBR. Normally, this field is populated with a number, but text values may be used also.



Health IT Policy Committee

A Public Advisory Body on Health Information Technology to the National Coordinator for Health IT

September 9, 2011

Farzad Mostashari, MD, ScM
National Coordinator for Health Information Technology
Department of Health and Human Services
200 Independence Avenue, SW
Washington, DC 20201

Dear Dr. Mostashari:

The HIT Standards Committee's (HITSC) Clinical Quality Measures Workgroup (CQMWG) and Vocabulary Task Force (VTF) jointly developed recommendations on the assignment of code sets to clinical concepts [data elements] for use in quality measures.

The CQMWG and VTF held a series of joint meetings to develop the set of recommendations. This letter transmits the recommendations to the Department of Health and Human Services (HHS) on the assignment of code sets to clinical concepts for use in quality measures. On August 17, 2011, the CQMWG and VTF reported on and discussed their findings with the HITSC, which were subsequently approved as outlined below.

LOINC Names

Introduction to LOINC Naming
Conventions

Anatomy of a LOINC Term

5193-8:Hepatitis B virus surface Ab:ACnc:Pt:Ser:Qn:EIA

5193-8

LOINC Code

Hepatitis B virus surface Ab

ACnc

Pt

Ser

Qn

EIA

Component

Property Measured

Timing

System

Scale

Method



There are six major LOINC axes

NOT part of a LOINC Name

Reason for the test (disease it diagnoses)

Testing instrument

Specific details about the specimen

Priority (e.g. STAT)

Where testing was done

Who did the test

Test interpretation

Anything not part of naming the test

Stuff carried in other parts of HL7 message

Component

The substance or entity that is measured, evaluated, or observed

Sodium

Glucose

Brucella sp. organism

Influenza A Virus antigen

Cytomegalovirus antibody

Lipids.total



5193-8:Hepatitis B virus surface Ab:ACnc:Pt:Ser:Qn:EIA

Component Structure

Analyte Name^Challenge^Adjustments

Formal analyte name

Specify “subanalytes”

May have subclasses

Calcium

Coronavirus Ag

Calcium.ionized

Challenge

Two parts separated
by “post”

1H post 100 g Glucose PO

<time delay>post<challenge type>

Adjustments

Adjusted to pH 7.4

Property

* the most difficult LOINC axis

The characteristic or attribute of the analyte that is measured, evaluated, or observed.

Major Categories:

mass

substance

catalytic activity

arbitrary

number



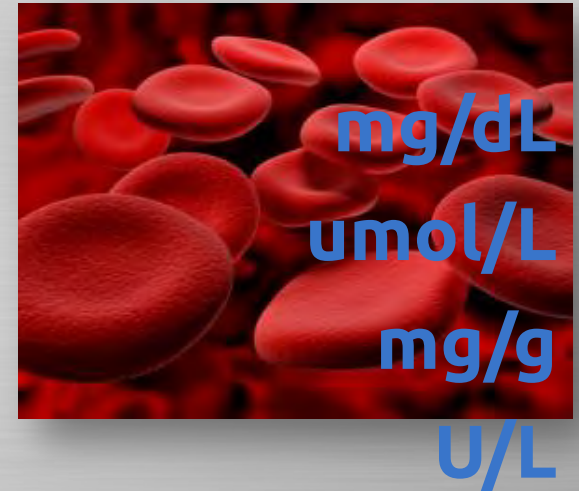
5193-8:Hepatitis B virus surface Ab:ACnc:Pt:Ser:Qn:EIA

Property

* the most difficult LOINC axis

Fully Named Properties

MCnc	<i>mass concentration</i>
SCnc	<i>substance concentration</i>
MCnt	<i>mass content</i>
CCnc	<i>catalytic concentration</i>
Prid	<i>presence or identity</i>
Imp	<i>impression</i>
Type	<i>"kind of"</i>



Property is related to units of measure

MAPPING CAUTION



Common Property Issues

Fraction versus Ratio

Fraction = Part/Whole

NFr: % Eosinophils / leukocytes

SFr: % HGB which is A2

Ratio = multiple analytes from *same* system

MCrto: BUN/Creatinine in urine

Relative Ratio = measures from *different* system

RelRto: actual to normal control

Timing

The interval of time over which the observation or measurement was made

Pt	<i>point in time</i>
12H	<i>12 hour collection</i>
24H	<i>24 hour collection</i>



Non-Pt timings are often

5193-8:Hepatitis B virus surface Ab:ACnc:Pt:Ser:Qn:EIA

round with Rate Property

System

The system (context) or specimen type upon which the observation was made.

Ser	<i>serum</i>
Ser/Plas	<i>serum or plasma</i>
Bld	<i>whole blood</i>
Ur	<i>urine</i>
Flu	<i>body fluid</i>
Tiss	<i>tissue</i>
XXX	<i>specified elsewhere</i>



photo via [AlishaV](#)

5193-8:Hepatitis B virus surface Ab:ACnc:Pt:Ser:Qn:EIA

System Structure

System^Super System

Super System

Patient is the default

Used to indicate:

blood product unit, bone marrow donor, fetus

818-5:A Ag:ACnc:Pt:RBC^BPU:Ord:

11670-7:Blood flow.mean:Vel:Pt:Aortic arch^fetus:Qn:US.doppler

Scale

- Qn** *Quantitative*
continuous numeric
can have operators
- Ord** *Ordinal*
Ranked set (1+, 2+, 3+)
- Nom** *Nominal*
unranked collection
Taxonomy (e.g. bacteria)
- Nar** *Narrative*



photo via [puukibeach](#)

5193-8:Hepatitis B virus surface Ab:ACnc:Pt:Ser:Qn:EIA

Method

Only needed if interpretation affected

Different normal ranges

Test sensitivity

Listed at the generic level

Agglutination

Enzyme Immunoassay

Probe with target amplification



5193-8:Hepatitis B virus surface Ab:ACnc:Pt:Ser:Qn:EIA



LOINC Collections

Panels, forms, surveys, and other patient assessments

Standardized Assessments and Collections

Representing Patient Assessments in LOINC®

Daniel J. Vreeman, PT, DPT, MSc^a, Clement J. McDonald, MD^b, Stanley M. Huff, MD^c
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^bLister Hill Center, National Library of Medicine, Washington DC; ^cUniversity of Utah
and Intermountain Healthcare, Salt Lake City, UT

ABSTRACT

Without being included in accepted vocabulary standards, the results of completed patient assessment instruments cannot be easily shared in health information exchanges. To address this important barrier, we have developed a robust model to represent assessments in LOINC through iterative refinement and collaborative development. To capture the essential aspects of the assessment, the LOINC model represents the hierarchical panel structure, global item attributes, panel-specific item attributes, and structured answer lists. All assessments are available in a uniform format within the freely available LOINC distribution. We have successfully added many assessments to LOINC in this model, including several federally required assessments that contain functioning and disability content. We continue adding to this "master question file" to further enable interoperable exchange, storage, and processing of assessment data.

INTRODUCTION

Despite progress on many fronts, interoperable health information exchange continues to be hampered by the plethora of idiosyncratic conventions for representing clinical concepts in different electronic systems. Many times, the lack of interoperable connections between systems means that valuable results are unavailable to clinicians when they need it.¹ LOINC® (Logical Observation Identifiers Names and Codes) is a universal code system for identifying

representation of assessments since its early development when it included codes for standardized scales such as the Glasgow Coma Score and the Apgar Score. Prior work^{5,6} has demonstrated the capability of LOINC's semantic model to represent many assessments with only modest extensions.

Over time, we have both significantly refined LOINC's model for patient assessments and added much new content. Here we present a summary of this progress. Specifically, the purpose of this paper is to describe LOINC's model for assessments, the methods and rationale by which this model was developed, the current assessment content, and some of the lessons learned in the process.

BACKGROUND

Fully specified LOINC names are constructed on six main axes (Component, Property, Timing, System, Scale, and Method) containing sufficient information to distinguish among similar observations.² Different LOINC codes are assigned to observations that measure the same attribute but have different clinical meanings. The LOINC codes, names, and other attributes are distributed in the main LOINC database made available at no cost in regular releases on the LOINC website (<http://loinc.org>). In addition to the LOINC database, Regenstrief develops and distributes at no cost a software program called RELMA that provides tools for searching the LOINC database, viewing detailed accessory content, and for mapping local terminology to LOINC terms.

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LOINC®: a universal catalogue of individual clinical observations and uniform representation of enumerated collections

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Abstract: In many areas of practice and research, clinical observations are recorded on data collection forms by asking and answering questions, yet without being represented in accepted terminology standards these results cannot be easily shared among clinical care and research systems. LOINC contains a well-developed model for representing variables, answer lists and the collections that contain them. We have successfully added many assessments and other collections of variables to LOINC in this model. By creating a uniform representation and distributing it worldwide at no cost, LOINC aims to lower the barriers to interoperability among systems and make this valuable data available across settings when and where it is needed.

Keywords: clinical observations; framework; health information technology; patient data; patient assessments; data sets; public health; research; standards; terminology.

Vreeman DJ, McDonald CJ, Huff SM. Representing patient assessments in LOINC®. AMIA Annu Symp Proc. 2010;832-836. PMID: 21347095.

Vreeman DJ, McDonald CJ, Huff SM. LOINC® - A Universal Catalog of Individual Clinical Observations and Uniform Representation of Enumerated Collections. Int J Funct Inform Personal Med. 2010;3(4):273-291.

Iteratively *expanded the
base lab panel model* to
accommodate more
complex attributes



Hierarchy of a Panel in LOINC

57021-8 CBC W Auto Differential panel in Blood

PANEL HIERARCHY

LOINC#	LOINC Name
57021-8	CBC W Auto Differential panel in Blood
58410-2	Complete blood count (hemogram) panel in Blood by Automated count
6690-2	Leukocytes [# /volume] in Blood by Automated count
789-8	Erythrocytes [# /volume] in Blood by Automated count
718-7	Hemoglobin [Mass/volume] in Blood
4544-3	Hematocrit [Volume Fraction] of Blood by Automated count
787-2	Erythrocyte mean corpuscular volume [Entitic volume] by Automated count
785-6	Erythrocyte mean corpuscular hemoglobin [Entitic mass] by Automated count
786-4	Erythrocyte mean corpuscular hemoglobin concentration [Mass/volume] by Automated count
21000-5	Erythrocyte distribution width [Entitic volume] by Automated count
788-0	Erythrocyte distribution width [Ratio] by Automated count
777-3	Platelets [# /volume] in Blood by Automated count
32207-3	Platelet distribution width [Entitic volume] in Blood by Automated count
32623-1	Platelet mean volume [Entitic volume] in Blood by Automated count
57023-4	Auto Differential panel in Blood
770-8	Neutrophils/100 leukocytes in Blood by Automated count
35332-6	Neutrophils band form/100 leukocytes in Blood by Automated count



Purpose

Assessments are widely used...

VALEPORT QUESTIONNAIRE	
1. Do you (often) have trouble getting or keeping an erection?	Yes / No
2. Do you (often) have trouble getting or keeping an erection?	Yes / No
3. Do you (often) have trouble getting or keeping an erection?	Yes / No
4. Do you (often) have trouble getting or keeping an erection?	Yes / No
5. Do you (often) have trouble getting or keeping an erection?	Yes / No
6. Do you (often) have trouble getting or keeping an erection?	Yes / No
7. Do you (often) have trouble getting or keeping an erection?	Yes / No
8. Do you (often) have trouble getting or keeping an erection?	Yes / No
9. Do you (often) have trouble getting or keeping an erection?	Yes / No
10. Do you (often) have trouble getting or keeping an erection?	Yes / No
11. Do you (often) have trouble getting or keeping an erection?	Yes / No
12. Do you (often) have trouble getting or keeping an erection?	Yes / No
13. Do you (often) have trouble getting or keeping an erection?	Yes / No
14. Do you (often) have trouble getting or keeping an erection?	Yes / No
15. Do you (often) have trouble getting or keeping an erection?	Yes / No
16. Do you (often) have trouble getting or keeping an erection?	Yes / No
17. Do you (often) have trouble getting or keeping an erection?	Yes / No
18. Do you (often) have trouble getting or keeping an erection?	Yes / No
19. Do you (often) have trouble getting or keeping an erection?	Yes / No
20. Do you (often) have trouble getting or keeping an erection?	Yes / No
21. Do you (often) have trouble getting or keeping an erection?	Yes / No

PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

NAME: _____ DATE: _____

Over the last 2 weeks, how often have you been bothered by any of the following problems? (use "✓" to indicate your answer)

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	✓			
2. Feeling down, depressed, or hopeless	✓			
3. Trouble falling or staying asleep, or sleeping too much	✓			
4. Feeling tired or having little energy	✓			
5. Poor appetite or overeating	✓			
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	✓			
7. Trouble concentrating on things, such as reading the newspaper or watching television	✓			
8. Moving or speaking so slowly that other people could have noticed. Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual	✓			
9. Thoughts that you would be better off dead, or of hurting yourself in some way	✓			

add columns: _____ TOTAL: _____

(Healthcare professional. For interpretation of TOTAL, please refer to accompanying scoring card.)

5-item International Index of Erectile Function (IIEF-5)

How do you rate your confidence that you can get and keep an erection?

	Very low	Low	Moderate	High	Very high
	1	2	3	4	5
1. With sexual stimulation, how often have your erections been sufficient to allow or penetration (entering your partner)?					
2. During sexual intercourse, how often were you able to maintain an erection (penetration)?					
3. During sexual intercourse, how difficult has it been to maintain your erections until completion of intercourse?					
4. When you attempted sexual intercourse, how often was it satisfactory to you?					

...and not unlike other clinical observations

LOINC could be a
master question file
and
uniform representation

Look back period for all items is 7 days unless another time frame is indicated.

E1100. Change in Behavior or Other Symptoms

Consider all of the symptoms assessed in items E0100 through E1000

Enter Code	How does resident's current behavior status, care rejection, or wandering compare to prior assessment (OBRA or PPS)?
	0. Same
	1. Improved
	2. Worse
	3. N/A because no prior MDS assessment

54696-0 **Change in behavioral or other symptoms in last 7D: Find: Pt: ^Patient: Ord:**
MDSv3

NAME

Fully-Specified Name:	Component	Property	Time Aspect	System	Scale	Method
	Change in behavioral or other symptoms in last 7D	Find	Pt	^Patient	Ord	MDSv3
Long Common Name:	Change in behavioral or other symptoms in last 7 days MDSv3					

OBSERVATION ID IN FORM

E1100

FORM CODING INSTRUCTIONS

Consider all of the symptoms assessed in items E0100 through E1000.

NORMATIVE ANSWER LIST:

Source: Change in behavioral or other symptoms
Code System OID: 1.3.6.1.4.1.12009.10.1.34

SEQ#	Answer	Code	Answer ID
1	Same	0	LA11009-0
2	Improved	1	LA65-8
3	Worse	2	LA11011-6
4	N/A because no prior MDS assessment	3	LA11012-4

SURVEY QUESTION:

Text: Change in behavioral or other symptoms -
How does resident's current behavior status, care rejection, or wandering compare to prior assessment (OBRA or PPS)?
Source: MDSv3.E1100

Accessory Files

LOINC 2.32
Released: 2010-06-30

Additional files available in the LOINC distribution:

- LOINC Panels and Forms File
- LOINC Multiaxial Hierarchy File
- LOINC Context-specific Hierarchy Template File

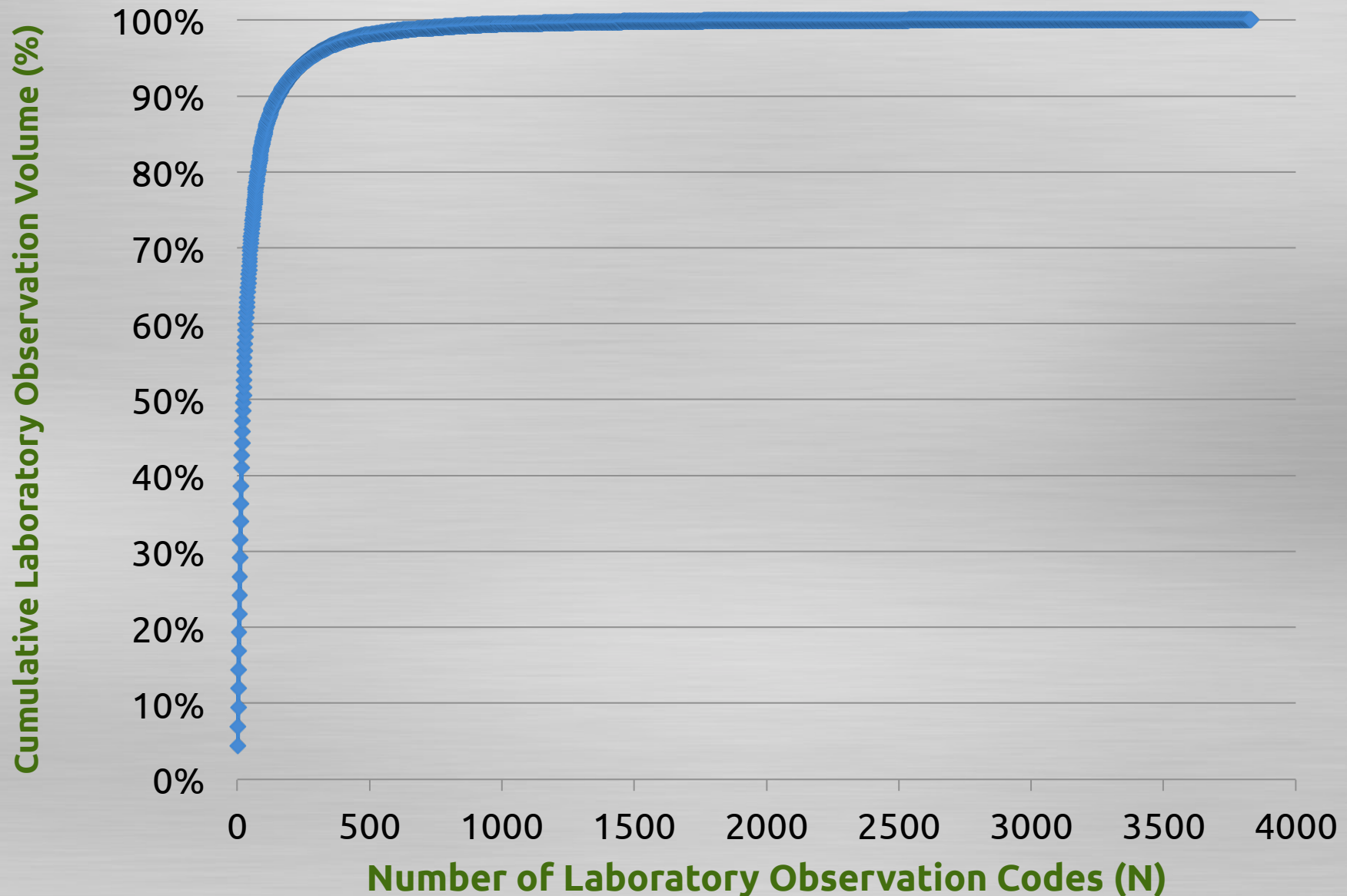
[Download Now](#)

Panels/Forms Available as Separate Download

+ @ http://loinc.org/downloads																			
										Sheets	Charts	SmartArt Graphics	WordArt						
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
1	PARENT_ID	PARENT_LC	PARENT_NAME	ID	SEQUENCE	LOINC_NUT	LOINC_NA	DISPLAY_N	OBSERVAT	SUBMITTER	SKIP_LOGIC	SKIP_LOGIC	SKIP_LOGIC	ANSWER_R	MAXIMUM	DEFAULT_V	TYPE_OF_E	DATA_TYPE	DATA
1982	28138	54580-6	Minimum Data Set 3.0:	28138	589	54580-6	Minimum Data Set 3.0:	Pt:Patient:::											
1983	28138	54580-6	Minimum Data Set 3.0:	28139	1	54501-2	Identification information:	Pt:Patient:::											
1984	28138	54580-6	Minimum Data Set 3.0:	28187	2	54508-7	Hearing, speech, and vision:	Pt:Patient:::											
1985	28138	54580-6	Minimum Data Set 3.0:	28198	3	54509-5	Cognitive patterns:	Pt:Patient:::											
1986	28138	54580-6	Minimum Data Set 3.0:	28231	4	54633-3	Mood:	Pt:Patient:::	MDSv3:										
1987	28138	54580-6	Minimum Data Set 3.0:	28282	5	54511-1	Behavior:	Pt:Patient:::											
1988	28138	54580-6	Minimum Data Set 3.0:	28309	6	54518-6	Preferences for customary routine and activities:	Pt:Patient:::											
1989	28138	54580-6	Minimum Data Set 3.0:	28354	7	54522-8	Functional status:	Pt:Patient:::											
1990	28138	54580-6	Minimum Data Set 3.0:	28387	8	54528-5	Bladder and bowel:	Pt:Patient:::											
1991	28138	54580-6	Minimum Data Set 3.0:	28404	9	54531-9	Active disease diagnosis:	Pt:Patient:::											
1992	28138	54580-6	Minimum Data Set 3.0:	28483	10	54556-6	Health conditions:	Pt:Patient:::											
1993	28138	54580-6	Minimum Data Set 3.0:	28530	11	54565-7	Swallowing Swallowing/Nutritional Status												
1994	28138	54580-6	Minimum Data Set 3.0:	28551	12	54570-7	Oral & or de Oral/Dental Status												
1995	28138	54580-6	Minimum Data Set 3.0:	28561	13	54572-3	Skin conditions:	Pt:Patient:::											
1996	28138	54580-6	Minimum Data Set 3.0:	28637	14	55094-7	Medications:	Pt:Patient:::	MDSv3:										
1997	28138	54580-6	Minimum Data Set 3.0:	28647	15	54990-7	Special treatments and procedures:	Pt:Patient:::											
1998	28138	54580-6	Minimum Data Set 3.0:	28733	16	55042-6	Restraints:	Pt:Patient:::											
1999	28138	54580-6	Minimum Data Set 3.0:	28751	17	55059-0	Therapy supplement for Medicare PPS:	Pt:Patient:::											
2000	28138	54580-6	Minimum Data Set 3.0:	28757	18	55063-2	Assessment administration:	Pt:Patient:::											
2001	28139	54501-2	Identification informati	28140	1	54581-4	Facility provider numbers:	Pt:Facility:::	MDSv3:										
2002	28139	54501-2	Identification informati	28143	2	54582-2	Provider ty: Type of Provider												
2003	28139	54501-2	Identification informati	28144	3	54502-0	Assessmen: Type of Assessment/Tracking												
2004	28139	54501-2	Identification informati	28150	4	54896-6	Submission requirement:Find:Pt:Patient:Ord:MDSv3:												
2005	28139	54501-2	Identification informati	28151	5	54503-8	Legal name of resident:	Pt:Patient:::											
2006	28139	54501-2	Identification informati	28157	6	45966-9	Social security & medicare numbers:	Pt:Patient:Set:::											
2007	28139	54501-2	Identification informati	28161	7	54505-3	Language:	Pt:Patient:::											
2008	28139	54501-2	Identification informati	28165	8	54506-1	Optional resident items:	Pt:Patient:::											
2009	28139	54501-2	Identification informati	28169	9	54589-7	Preadmission Screening and Resident Review (PASRR):Find:Pt:Patient:Nom:MDSv3:												
2010	28139	54501-2	Identification informati	28170	10	45973-5	Conditions Conditions Related to MR/DD Status												
2011	28139	54501-2	Identification informati	28178	11	54590-5	Entry type: Type of Entry												
2012	28139	54501-2	Identification informati	28179	12	54591-3	Admitted fr Entered from												
2013	28139	54501-2	Identification informati	28180	14	54592-1	Previous assessment reference date for significant correction:TmStp:Pt:Patient:Qn:MDSv3:												
2014	28139	54501-2	Identification informati	28181	15	54593-9	Assessment reference date - observation end date:TmStp:Pt:Patient:Qn:MDSv3:												
2015	28139	54501-2	Identification informati	28182	16	54507-9	Medicare stay:	Pt:Patient:::											
2016	28139	54501-2	Identification informati	28859	13	55128-3	Discharge status:Find:Pt:Patient:Nom:MDSv3:												
2017	28144	54502-0	Assessment &or trackin	28145	1	54583-0	Federal OR: Federal OBRA Reason for Assessment/Tracking												

loinc.org/usage

A Few Tests Give Most Results



you are here: [home](#) → [usage](#)

LOINC Usage

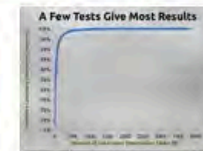
Harnessing Zipf's law for you.

■ [results](#) | [orders](#) | [units](#)



Common LOINC Laboratory Observation Codes





We created an empirically-based list of the **most common LOINC result codes** for laboratories, practices, researchers, and others who wish to map their laboratory test results to LOINC codes. Knowing that a relatively small number of codes account for much of the result volume, we think that Top 2000+ list will be an efficient way to represent about 98% of the test volume carried by three large



“Top 2000 Results”

Lab Tests with a wealth of advice and guidance about which codes to

LOINC Top 2000+ Lab Observations and Mapper's Guide

-  [LOINC Mapper's Guide to the Top 2000+ Lab Observations – Introduction to Version 1.0 \(pdf\)](#)
File Version: Top 2000+ Lab Observations Introduction 1.0 | File type: application/pdf | Release Date: 2011-05-31
File Description: Background document describing the origins, development, and organization of the LOINC Mapper's Guide to the Top 2000+ Lab Observations.
-  [LOINC Mapper's Guide to the Top 2000+ Lab Observations – Version 1.0a \(pdf\)](#)
File Version: LOINC Mapper's Guide to the Top 2000+ Lab Observations 1.0 | File type: application/pdf | Release Date: 2011-06-01
File Description: Document containing mapping guidance for the LOINC Top 2000+ Lab Observations.
OID: 1.3.6.1.4.1.12009.10.2.3
-  [LOINC Mapper's Guide to the Top 2000+ Lab Observations – Version 1.0a \(xlsx\)](#)
File Version: LOINC Mapper's Guide to the Top 2000+ Lab Observations 1.0 | File type: application/vnd.openxmlformats-officedocument.spreadsheetml.sheet | Release Date: 2010-06-01
File Description: Document containing mapping guidance for the LOINC Top 2000+ Lab Observations. Requires a loinc.org account.
OID: 1.3.6.1.4.1.12009.10.2.3
-  [LOINC Top 2000+ Lab Observations – Version 1.0 \(csv\)](#)
File Version: Top 2000+ Lab Observations 1.0 | File type: text/comma-separated-values | Release Date: 2010-05-31
File Description: The list of LOINC Top 2000+ Lab Observations in a simple CSV file. Does NOT contain mapping guidance.
OID: 1.3.6.1.4.1.12009.10.2.3

Notes about Version 1.0a: This version contains a couple of corrections for UCUM units. The rest of the content is unchanged from version 1.0 (2010-05-31)

Current Versions

LOINC 2.38

Released: 2011-12-30

RELMA 5.5

Released: 2011-12-30

[Download Now](#)

Recent Forum Posts

Microbiology | Re: Microbiology Text results and LOINC

Microbiology | Re: Organism Names and LOINC?

[More posts...](#)



LOINC New paper published in JBI about helping map to #LOINC with RELMA by augmenting local test names [loinc.org/articles/Kim20...](#)
about 1 hour ago · reply · retweet · favorite

[Join the conversation](#)

Common Result Codes in LOINC and RELMA

The Top 2000+ LOINC terms have their relative rank stored in the COMMON_TEST_RANK field of the main LOINC table. Starting with RELMA version 5.3, the program's "common lab tests only" filter will limit searches to only return codes in this common test list.

Through LOINC version 2.34, the INPC_PERCENTAGE field of the main LOINC table contained the relative percent volume by test result based on an analysis of 3 years (2006–2008) of laboratory result data from the [Indiana Network for Patient Care \(INPC\)](#), one of the oldest and largest health information exchanges in the US. Within the RELMA mapping program, the "common lab tests only" filter limits searches to only return codes in this common test list.

Background Reading

- [Vreeman DJ, Finnell JT, Overhage JM. A Rationale for Parsimonious Laboratory Term Mapping by Frequency. Proc AMIA Symp. 2007;771–775.](#)



Value set of universal laboratory order codes from LOINC

This value set defines a **collection of universal laboratory order codes** for use by developers of order entry systems that deliver them in HL7 messages to laboratories, where they could be understood and fulfilled. This value set is designed to cover greater than 95% of the test ordering volume in the US, and was developed by the HITSP C80 Clinical Document and Messaging Terminology Workgroup. It is considered a minimum 'starter' set" and "does not attempt to include all

a.k.a. "Top 300 Orders"

Value Set

- [Common Lab Orders Value Set – Preface to Version 1.2 \(pdf\)](#)
File Version: Common Lab Orders Preface 1.2 | File type: application/pdf | Release Date: 2011–06–03
- [Common Lab Orders Value Set – Version 1.2 \(pdf\)](#)
File Version: Common Lab Orders 1.2 with Preface | File type: application/pdf | Release Date: 2011–06–03
OID: 1.3.6.1.4.1.12009.10.2.2
- [Common Lab Orders Value Set – Version 1.2 \(xlsx\)](#) or if you prefer (xls)
File Version: Common Lab Orders 1.2 | File type: application/vnd.openxmlformats-officedocument.spreadsheetml.sheet | Release Date: 2011–06–03
OID: 1.3.6.1.4.1.12009.10.2.2

HITSP C80

- [HITSP C80 – Clinical Document and Message Terminology Component](#)
Table 2–96 "Laboratory Order Value Set" reference to the LOINC Common Lab Orders value set



Example UCUM codes for units of measure in electronic messages

This is a draft enumeration of [The Unified Code for Units of Measure \(UCUM\)](#), designed to make it clear what the UCUM syntax would produce for specific unit patterns in electronic communication. This early version, composed in a relatively short time frame, is based on content provided by [Intermountain Healthcare](#), from a [National Library of Medicine](#) and [Regenstrief Institute](#) project that is analyzing raw units from more than 23 laboratory sources and their translation to UCUM and from the HL7 table of units. In this version we have not included all of the content from all of these sources. Specifically for this version, we excluded units for which we could not quickly find definitions or clear patterns of usage, units of measure that we believed would only be used in pharmacy dispensing, and units used for purely clinical reporting (e.g. cigarette pack-years). We have included most of the pure metric units that were in the source table whether they apply



Example UCUM codes for units of measure in electronic messages

This is a draft enumeration of [The Unified Code for Units of Measure \(UCUM\)](#), designed to make it clear what the UCUM syntax would produce for specific unit patterns in electronic communication. This early version, composed in a relatively short time frame, is based on content provided by [Intermountain Healthcare](#), from a [National Library of Medicine and Regenstrief Institute](#) project that is analyzing raw units from more than 23 laboratory sources and their translation to UCUM, and from the [HL7 Table of Units to this enumeration](#) have not included all of the content from all of these sources. Specifically for this version, we excluded units that could only be used in pharmacy dispensing, and units that were in the source table whether they apply to laboratory or pharmacy could be excluded.

a.k.a. “Common Units of Measure”

Table of Example UCUM Codes for Electronic Messaging

- [Table of Example UCUM Codes for Electronic Messaging – Preface to Version 1.1 \(pdf\)](#)

File Version: Table of Example UCUM Codes for Electronic Messaging Preface 1.1 | File type: application/pdf | Release Date: 2011-10-04

- [Table of Example UCUM Codes for Electronic Messaging – Version 1.1 \(pdf\)](#)

File Version: Table of Example UCUM Codes for Electronic Messaging 1.1 | File type: application/pdf | Release Date: 2011-10-04

- [Table of Example UCUM Codes for Electronic Messaging – Version 1.1 \(xlsx\)](#)

File Version: Table of Example UCUM Codes for Electronic Messaging 1.1 | File type: application/vnd.openxmlformats-officedocument.spreadsheetml.sheet | Release Date: 2011-10-04

by [Daniel Vreeman](#) — last modified 2011-10-12 03:00



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LOINC MAPPER'S GUIDE TO TOP 2000+ LAB TESTS v1.0a

SORT BY: Class Override >System
Adjusted > Long Common Name

	B	C	E	F	G	H	I	P
	LOINC #	Long Common Name	Class Override	Rank	Example UCUM	Example UCUM Display	Comment	System Adjusted
1								
126		Antibacterial susceptibility						
		<p>The statistics for antibiotic susceptibility tests in the Top 2000 List are not as broadly based as most of the other test categories, because antibiotic susceptibilities were available from only one of our 3 sources.</p> <p>LOINC provides codes for antibiotic susceptibility testing based on method used. The four major categories are as follows:</p> <ol style="list-style-type: none"> 1) A general flavor that does not specify the method of testing used 2) Minimum Inhibitory Concentrations (MIC) 3) Kirby Bauer disc testing (KB) and 4) Gradient strip (E-test) <p>The general flavor can be used to report results for any of the three more specific approaches (Kirby Bauer, MIC or E-test susceptibilities) assuming that the details regarding the method of testing is provided elsewhere in the messages or in other OBX segments.</p> <p>The majority of the antibiotic susceptibility tests that made it into the top 2000 list are of this general flavor type, but a few MIC tests and gradient strip LOINC codes also appear. In case your laboratory prefers the more specific codes for the antibiotics listed here, you can find them under the Antibiotic susceptibility class in the full LOINC database.</p> <p>Some of the antibiotics used to treat tuberculosis are also used to treat more common bacterial infections. LOINC provides specific codes for reporting antibiotic susceptibilities to slow growing Mycobacteria – such as M.tuberculosis, M.avium and M.intracellular, and these codes should be used for reporting antibiotic susceptibilities for such bacteria. These codes can be identified by the phrase “slow growing mycobacteria” in the method part of the LOINC name. Antibiotic susceptibilities to a fast growing mycobacteria can be reported under the same codes as any other bacteria.</p>						
127								
128	13317-3	Methicillin resistant Staphylococcus aureus [Presence] in Unspecified specimen by Organism specific culture	Antibacterial susceptibility	146			Methicillin Resistant Staphylococcus via culture--	Any
129	18860-7	Amikacin [Susceptibility]	Antibacterial susceptibility	414				Isolate
130	18862-3	Amoxicillin+Clavulanate [Susceptibility]	Antibacterial susceptibility	549				Isolate
131	18864-9	Ampicillin [Susceptibility]	Antibacterial susceptibility	331				Isolate
132	18865-6	Ampicillin+Sulbactam [Susceptibility]	Antibacterial susceptibility	330				Isolate
133	18868-0	Aztreonam [Susceptibility]	Antibacterial	454				Isolate

Closing Themes

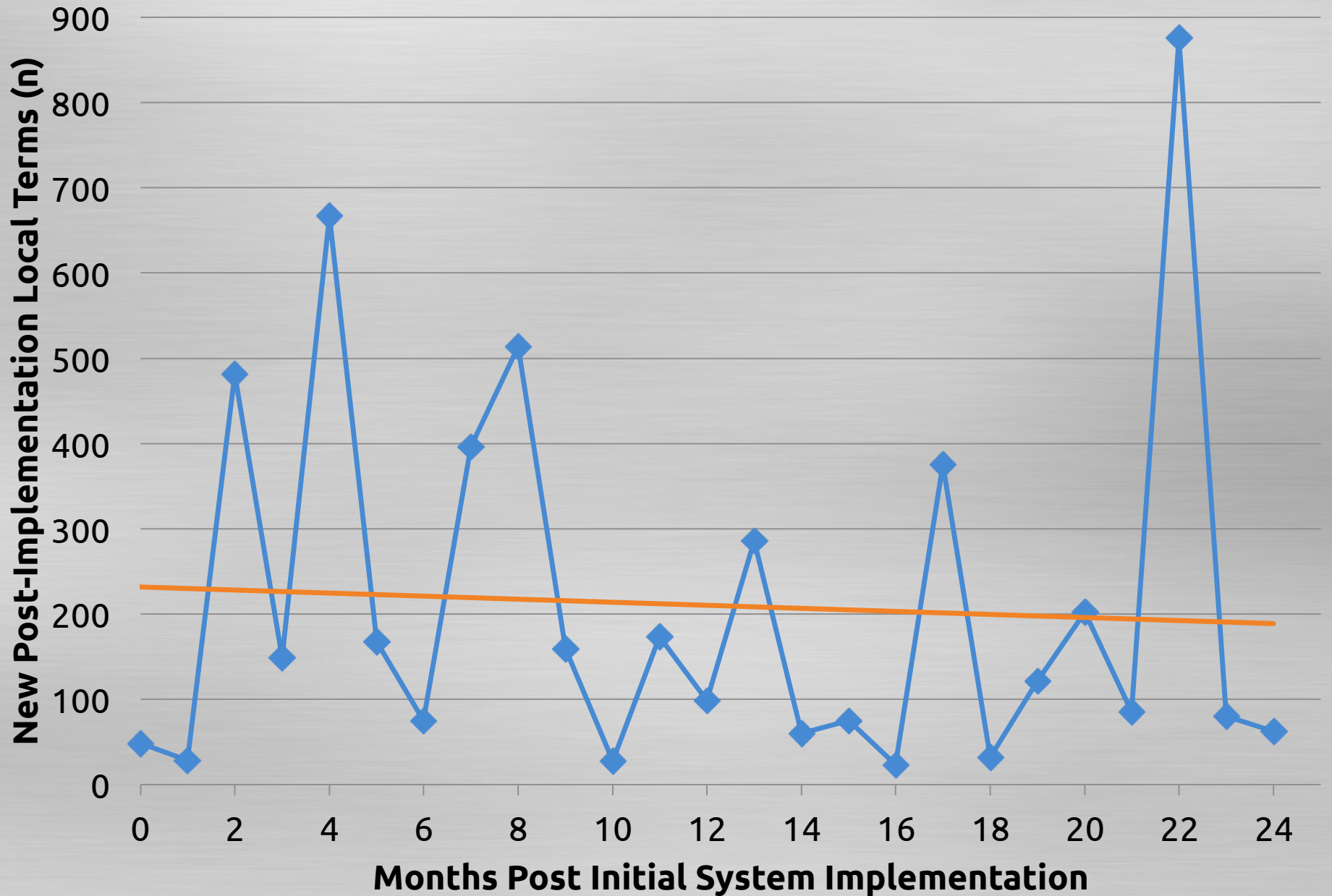
General recommendations for health data exchange with LOINC

A journey.

Not a destination.



Post-Implementation Terms Since Go-live



Add half as many terms
after go-live.

Most new local terms *could
be mapped to existing
LOINCs.*

Jump In!



photo via [Justin Ornellas](#)

A fly fisherman in a waders and hat is standing in a river, casting a fly. The background is a dense forest with trees in vibrant autumn colors of yellow, orange, and green. The water is calm with some ripples.

Help standardize data upstream



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"Today's clinical labs and their vendors—the IVD industry—spend a great deal of time and money connecting analyzers and IT systems to one another. IICC unites the stakeholders around a common goal—to solve our shared problem through modern connectivity technology."

Eric Olson, President, IICC, and Vice President, Automation & IT, Siemens Healthcare Diagnostics [MORE >](#)

"The current explosion of healthcare information technology (HIT) will continue to heavily impact healthcare in the foreseeable future. Modernizing instrument interface and interoperability standards will integrate the clinical lab into the mainstream of this health information flow."

Jay B. Jones, PhD, DABCC, Board Member and Chair of the Provider Review Committee, IICC, and Director, Chemistry & Regional Labs, Geisinger Health System [MORE >](#)

Founding Members



Join IICC at IHE
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The Race is On!



Happy LOINCing!

photo via [ryarwood](#)

Acknowledgements

LOINC Development Team

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LOINC Committee

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