Using LOINC for Clinical Quality Measures
The Indian Health Service Experience
2019 LOINC Fall Conference

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Objectives

- Understand the US Indian Health Service
- The role of eCQMs in IHS
- Deployment of LOINC mapping in the EHR
- Development of lab (and other) clinical taxonomies (‘value sets’)
- Lessons Learned
The Indian Health Service (IHS)

Mission: to raise the physical, mental, social, and spiritual health of American Indians and Alaska natives to the highest level

Vision: healthy communities and quality health care systems through strong partnerships and culturally responsive practices

- Provides comprehensive health delivery system for approx 2.6 million American Indians and Alaska Natives who belong to 573 federally recognized tribes in 37 states
- Operates within the Department of Health and Human Services
- Grew out of government-to-government relationship between the US federal government and Indian tribes established in 1787
- Currently utilizes the Resource and Patient Management System (RPMS) for its HIT
IHS Service Areas and Stats

- IHS services are administered through a system of 12 Area offices and 170 IHS and Tribally-managed service units
- Each area serves a unique group of tribes on a daily basis
- FY2018 Inpatient Admissions: 40,494
- FY2018 Outpatient Visits: 13,752,397
- Total IHS Employees: 15,370
  - Total IHS employees: 15,370
  - Nurses: 2,380
  - Physicians: 776
  - Pharmacists: 798
  - Dentists: 270
  - Physician Assistants: 104
  - Environmental Health and Sanitarians: 195
RPMS

- RPMS is a HIT system designed to support over 2 million lives
- Currently deployed in over 400 sites
- Client-server application that can be hosted locally or regionally
  - Over 130 software applications including
    - Clinical, administrative, population and public health
    - Clinical quality reporting is done locally, regionally and nationally
- RPMS information can be exchanged over a local area network (LAN) within a single facility, a wide area network (WAN) with other facilities, and the Internet with other providers and medical researchers
- RPMS data is exported to the National Data Warehouse- comprehensive data on over 10 million individual patients for last 40 years
Role of eCQMS in Indian Health

- Indian Health Service elected to develop, implement and start reporting electronic clinical quality measures in 2002
- Developed and released enterprise wide eCQM application to be used locally as well as nationally in 2004
- Required development of OS software application(s) that is updated on a routine basis
- Updates include taxonomies (value sets) that rely upon the integration of standard terminology and mapping in RPMS
- Starting in 2014, used central terminology server in addition to ‘internally developed’ value sets
eCQM Clinical Reporting System (CRS)

- CRS has been described as a scavenger hunter that looks for data in as many RPMS applications and as many fields as possible.
- To ensure comparable data within the agency as well as to external organizations, performance measure logic is based on standard national codes whenever possible.
  - Codes include:
    - ICD-9/10
    - CPT
    - LOINC
    - National IHS standard code sets (e.g., Health Factors, patient education codes, etc.) when SDO codes do not exist
- For lab tests or medications, CRS uses taxonomies (groups of “like” codes) that can be populated by an individual facility with its own test codes.
  - Sites must use the correct codes for patients to get counted for measures. These codes can be found in the CRS User Manual, which is available on the CRS page of the Indian Health Service website at: https://www.ihs.gov/crs/.
Taxonomy (Value Set) Reporting

- **Taxonomy Reports.** These reports allow users to identify the medications and laboratory tests currently included in their Clinical Reporting System for medication and laboratory taxonomies.
- Taxonomies developed using ICD10/SNOMED/LOINC for diagnostic and treatment taxonomies
- Laboratory team works with quality reporting team and national terminologist(s) to ensure adequacy
- QA done through Area based Performance Reporting leads
- Updated on routine basis
Integration of LOINC and lab clinical taxonomies into eCQM

- Started with commitment to eCQM work
- ‘Taxonomy’ concept built upon previous query abilities of RPMS
  - Started in 2002; before concept of ‘value set’ was ubiquitous
- LOINC mapping software application developed, published and deployed t/o Indian Health System
  - Very few clinical pathologists and/or reference labs in the IHS system so constrained data set
  - Engaged Veterans Health Administration for their insights and support
  - Required on average 40 hours of human mapping after initial ‘LOINC Mapper’ deployed in a facility (covered top x number of lab tests)
  - Worked with multiple ‘mom and pop’ labs to facilitate understanding and value of LOINC
LOINC in IHS RPMS Application History
over 100 references

- [PDF] IHS Code Mapping (BCQM)
  - ihs.gov/RPMS/PackageDocs/BCQM/bcqm0100.04t.pdf
  - LOINC for measurement type WT, pass 9999999.07 as the first parameter. LOOKUP Text (required) A unique lookup value into the table referenced in ...

- [PDF] TIU 1.0 p1011/1012 - ihs.gov
  - standards. (LOINC and HL7) • Extracted all TIU document titles from 128 databases [in the VA] (156,000) • Analyzed every term within the extracted ...

- [PDF] IHS Code Mapping
  - www.ihs.gov/RPMS/PackageDocs/BCQM/bcqm0100.04u.pdf
  - Identifiers Names and Codes (LOINC) codes. The mapping is done automatically when visits are created and when data elements are added to visits (V ...

- [PDF] IHS Clinical Reporting System (BGP)
  - LOINC taxonomy: 14585-4, 14959-1, 20621-9, 30000-4, 30001-2, 32294-1, 77253-3, 9318-7 [BGP QUANT UACR LOINC] – Site-populated taxonomy BGP QUANT ...

- [PDF] Laboratory Reference (LR)
  - www.ihs.gov/RPMS/PackageDocs/LR/lr_0520.33ot.pdf
  - Laboratory Reference (LR) Version 5.2 Patch 1033 Technical Manual LOINC and Related Dictionaries Updated September 2014 . 2 . 0 LOINC and Related ...
LOINC in IHS RPMS Application History—over 100 references

- [PDF] Frequently Asked Questions - Indian Health Service
  - and Codes (LOINC), and national IHS standard code sets (e.g., Health Factors, patient education codes, etc.). For lab tests or medications, CRS uses ...

- [PDF] Laboratory Reference (LR)
  - www.ihs.gov/RPMS/PackageDocs/LR/Ir__0520.31o.pdf
  - Laboratory Reference (LR) Version 5.2 Patch 1031 Laboratorian Guide Table of Contents May 2013 . v A.5 BLRIPLZI – Intermec IPL Accession Number ...

- [PDF] EHR GPRA Cervical Cancer Screening (Pap Smear)
  - www.ihs.gov/california/tasks/sites/default/assets/File/2012GPRAMtg-EHRCervicalCancerScreening_Taylor.pdf
  - Learning Objectives •Compare & Contrast the RPMS Clinical Applications that Impact the GPRA Cervical Cancer Screening PAP Smear Measure –Women’s ...

- [PDF] Clinical Quality Measures - IHS GPRA Coordinators Conference
  - www.ihs.gov/california/tasks/sites/default/assets/File/2012GPRAMtg-CQM_Lamer.pdf
  - LOINC codes for measures SNOMED codes for tobacco use SNOMED codes for refusals . Timeline ...

- [PDF] IHS Clinical Reporting System (BGP)
  - – LOINC taxonomy • Urine Albumin-to-Creatinine Ratio (UACR) during the Report Period, defined as any of the following: – CPT 82043 WITH 82570 – LOINC ...
Examples of Historic LOINC Clinical Taxonomies to support Pap Screening

- **Cervical Cytology (Pap Test)**
  - LOINC 10524-7, 18500-9, 19762-4, 19764-0, 19765-7, 19766-5, 19774-9, 33717-0, 47527-7, 47528-5
  - Site-populated taxonomy BGP PAP SMEAR TAX

- **HPV Test**
  - LOINC 21440-3, 30167-1, 38372-9, 49896-4, 59263-4, 59264-2, 59420-0, 69002-4, 71431-1, 75406-9, 75694-0, 77379-6, 77399-4, 77400-0
  - Site-populated taxonomy BGP HPV TAX
Examples of Historic LOINC Clinical Taxonomies to support Colorectal Cancer Screening

• FOBT
  • LOINC 12503-9, 12504-7, 14563-1, 14564-9, 14565-6, 2335-8, 27396-1, 27401-9, 27925-7, 27926-5, 29771-3, 56490-6, 56491-4, 57905-2, 58453-2, 80372-6
  • Site-populated taxonomy BGP GPRA FOB TESTS

• FIT DNA
  • LOINC 77353-1, 77354-9
  • Site-populated taxonomy BGP FIT-DNA TESTS
3.3 LOINC Auto-Mapper
Option LAMP from the new IHS LOINC/UCUM MENU can be run repeatedly to go through File 60 and automatically map tests to the appropriate LOINC code, provided an entry containing the test’s name, specimen and units is found in the IHS LOINC Master File (#90220). This Master File contains entries of the top orders as determined by HITSP and Regenstrief, as well as a representative sample of tests found at IHS facilities. Updating this file during the rollout phase will allow for greater automapping in the future.

3.4 LOINC Manual Mapper
Option LMMP from the new IHS LOINC/UCUM MENU can be run repeatedly to manually map tests to the appropriate LOINC code.

3.5 Lab Test File 60 Extract
Option LTXT from the new IHS LOINC/UCUM MENU can be run repeatedly to extract tests that have not yet been mapped to LOINC. The option creates a text file than can then be imported to Regenstrief’s RELMA tool for mapping. Once the proper LOINC codes have been identified, this info will be added to the IHS LOINC Master File. The updated file will be installed at site and the automapper run again.
Apelon terminology service centrally deployed to host and manage vocabularies like SNOMED CT, LOINC, UCUM, UNII. Indian Health Service still uses other Lexicon for other terminology/code sets like ICD, CPT, HCPCS. Lab mapping still occurs for LOINC.
The Site/Specimen' LOINC CODE field in the LABORATORY TEST (#60) file has been modified and is now mandatory.

**INPUT TO WHAT FILE:** LABORATORY TEST/

**EDIT WHICH FIELD:** ALL// SITE/SPECIMEN (multiple)

**EDIT WHICH SITE/SPECIMEN SUB-FIELD:** ALL// LOINC CODE

**THEN EDIT SITE/SPECIMEN SUB-FIELD:** THEN EDIT FIELD:

Select LABORATORY TEST NAME: GLUCOSE, PLASMA

**Select SITE/SPECIMEN:**

LOINC CODE: ??

LOINC CODE: ??

LOINC CODE: 2345 -7 VUID

GLUCOSE:MCNC:PT:SER/PLAS:QN:

Select SITE/SPECIMEN:
These utilities provide mapping from Indian Health Service (IHS) standard codes to Systemized Nomenclature of Medicine (SNOMED) and Logical Observation Identifiers Names and Codes (LOINC) codes. The mapping is done automatically when visits are created and when data elements are added to visits (V Files are created).

It is also used by a variety of other applications. With version 1.0 Patch 4, additional functionality was to provide code mapping to support the Electronic Clinical Quality Measures (eCQM). Selected entries in the following IHS Standard code tables are supported in Version 1.0:

Measurement Type
Exam
Health Factors
PCC Infant Feeding Choices Education Topics
PCC Additional Feeding Choices Patient Status Code (NUBC) Immunization
Clinical Review Action Service Category
CPT
ICD Operation/Procedure
Lessons Learned

- Having a ‘business reason’ for terminology is critical
- Terminology standards matter
- Passive mapping and integration makes things easier, but require review and verification
- Attention to detail is critical to success
- Continuous update of standards used in EHRs is critical
- eCQMs are one way to illustrate the importance of coding to health care team members