**Facilitating Laboratory Test Ordering and Reporting in the Electronic Health Record**

**Division of Laboratory Systems LabHIT Team:** Megan E. Sawchuk, BS, MT(ASCP), MariBeth Gagnon, MS CT(ASCP)HTL, Nancy E. Cornish, MD, FCAP, Ira M. Lubin, PhD, FACMG, Graylin Mitchell, MPH, MT, Sonya Strider, PhD, MT(ASCP), Manjula GamaRalalage, MBBS, MSc

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention. Use of trade names, commercial sources or private organizations is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services and/or CDC.

---

**Vision: Achieving Interoperability**

"Stretch Goal"

Support full-scale interoperability for laboratory data by providing a single national reference database of recommended vocabulary sets with mapping of test systems to code systems.

**Building World-Class Local, Regional & National Surveillance Capability**

**TEST SYSTEMS**

Various commercial instruments

**CLINICAL SETTINGS**

Various EHR & LIS systems

**PUBLIC HEALTH**

Various State EMIS systems

**CDC**

Various Surveillance Information Systems

**NATIONAL NOMENCLATURE REFERENCE FILE**

Free, downloadable XML or URL file of recommended vocabulary sets mapped to test systems

**VOCABULARY STANDARDS DEVELOPMENT**

For commercial FDA approved systems, modified IFTs and LOINC

**MESSAGE FORMAT STANDARDS DEVELOPMENT**

HF (v 5.5-3, CDAs, etc.)

**IDENTIFY PUBLIC HEALTH CASE DEFINITIONS**

Example: HIV patient

---

**Goal: Patient Safety & Data Integrity**

Laboratory data can be distributed rapidly and to numerous users in the healthcare system. The goal of interoperability is to ensure data integrity, trust, in electronic transmission, thereby also ensuring laboratory data is provided in a manner to support patient safety and optimized healthcare decision making.

---

**Objectives: Quality Clinical Data Capture and Achieving Meaningful Use**

Develop and disseminate code sets to support quality clinical data capture, thereby enabling electronic health record data to be used to inform decision making for individuals, healthcare providers, researchers and public health.

**Stage 1 Infrastructure**

- Individuals
- Researcher
- Healthcare Providers
- Public Health

**Stage 2 Information Exchange**

- Clinical Data Capture
- Clinical Laboratory
- Public Health Interoperability
- Clinical Setting Interoperability

**Stage 3 Advanced Use of Data**

- Laboratory Test Orders Support (LOINS)
- Health & Health IT Research
- CDC Data Capture & World Class Surveillance Capability

---

**Methods**

**SNOMED CT® - Model Example Project**

Laboratory Test Order Codes Initiative for Top Ordered Tests

**SNOMED CT® - Model Example Project**

Specimen attribute coding to fully define the tested specimen

<table>
<thead>
<tr>
<th>SNOMED CT® Code</th>
<th>Specimen Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNOMED CT® 012668000000000000</td>
<td>Sample test type</td>
</tr>
<tr>
<td>SNOMED CT® 012669000000000000</td>
<td>Sample test type modifier</td>
</tr>
<tr>
<td>SNOMED CT® 012670000000000000</td>
<td>Specimen attribute</td>
</tr>
<tr>
<td>SNOMED CT® 012671000000000000</td>
<td>Specimen collection method</td>
</tr>
<tr>
<td>SNOMED CT® 012672000000000000</td>
<td>Specimen source site</td>
</tr>
<tr>
<td>SNOMED CT® 012673000000000000</td>
<td>Specimen source site modifier</td>
</tr>
</tbody>
</table>

**SNOMED CT® - Model Example Project**

Specimen attribute coding to fully define the tested specimen

---

**LabHIT’s Central Role**

Bringing diverse stakeholders together

**Regulatory and Accreditation Organizations**

Clinical and Public Health Laboratory Reporting

**Professional Societies**

LabHIT

**Results**

- aLOINC® order codes will be included in Regenstrief’s LOINC Mapping Assistant (RELMA®) tool.
- SNOMED CT® codes are completed and available to fully define specimens.
- Terminology work is resource intensive and voluminous, requiring a long term commitment of resources.
- The long term iterative process to develop health IT terminology can result in duplicative efforts over time and from different stakeholders, nationally and internationally.
- An incremental approach is needed to continue moving each code set toward the vision.

**Next Steps**

**ENGAGEMENT**

- Continue promoting health IT opportunities via LabHIT email subscriber database:
  - Relevant federal grant opportunities (CDC, ONC, AHRQ)
  - Association of Pathology Informatics (API) Technical Member category to groom next generation laboratory science SMEs
  - Comment periods on proposed regulations, guidelines, and requests for information
- Facilitate participation of stakeholders with standards organizations, including clinical SMEs, software vendors, manufacturers, and professional organizations

**INTEROPERABILITY**

- Promote semantic interoperability workshops and guidance for laboratory testing systems in collaboration with FDA, NLM, CMS and ONC
- Support participation and leadership of private industry test system manufacturer funded organizations with an interest in interoperability
- Identify mechanisms to distribute standardized vocabulary for specimen test ordering to EHR vendors, e.g. relational database
- Serve as SMEs on numerous HL7 Initiatives related to laboratory standards
- Promote use of the CLIA standard level UPI Validation Suite by EHR vendors
- Propose a centralized laboratory LOINC® and SNOMED CT® coding process

**USABILITY & SAFETY**

- Participate on HL7 Laboratory Functional Behaviors Guide Workgroup
- Support NIST’s 2016 Usability Workshop, “The Role of Standards in Preventing & Mitigating Health IT Patient Safety Risks”
- Evaluate health IT related patient safety events reported to the FDA
- Create laboratory safety checklist for assessment of laboratory data display