MEDITECH LABORATORY TEST DICTIONARY & REPORTS
REVIEW & RECOMMENDATIONS
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Pan-Canadian Laboratory Observation Code Database (pCLOCD)

pCLOCD, a Canadian adaptation of the LOINC® database will be used to map lab orders and results to the Jurisdictional LIS (JLIS) to become part of the Interoperable Electronic Health Record (IEHR). pCLOCD was reviewed for this report and the following conclusions have been made:

1. Suggested mnemonics are not part of pCLOCD at this time. The naming conventions were considered for the proposed mnemonic development guidelines.

2. Although pCLOCD contains some order codes for panels, routine chemistry panels are not available at this time. Therefore an assumption can be made that the tests within the panels can be mapped to the JLIS but the panel name will not be available when looking up reports in the JLIS.

3. The pan-Canadian display name is algorithmically-generated using LOINC® elements such as SYSTEM (specimen type), PROPERTY (distinguishes different quantities of same substance), METHOD_TYP (distinguishes analytes measured by different methods) and TIME_ASPCT. Each LOINC® element is separated by a semicolon. Literature indicates that the display name would be primarily used as the report name seen in the JLIS web viewer. Therefore, for continuity, it would make sense to have the display name as the test report name in Meditech; however there are a couple of issues with this that should be discussed by key stakeholders as follows:
   a. Concatenation of the display name may be required. Some display names contain more than the 30 characters available in the long report name field in Meditech therefore they would need to be shortened and would not match the name in the JLIS web viewer.
   b. In some cases augmentation of the display name may be required to give enough information about the test. At present the specimen type (system) urine is not part of the display name if it is not an unusual specimen for the analyte. The assumption is that the specimen type would be available in another field in the JLIS web viewer however the test name on the report would require this information.
   c. The elements of the display name are separated by a semicolon and in some cases contain more information than report names used at present. This may cause some confusion to persons receiving reports and some educational materials may need to be developed and distributed.
REGIONAL TEST DICTIONARY RECOMMENDATIONS

DICTIONARY COMPARISON

Meditech lab mnemonics for Eastern Health St. John’s, Eastern Health Avalon and Eastern Health Peninsulas have been reviewed and in many cases found to have 3 different mnemonics for the same test. Creating a listed comparison of the mnemonics is complicated by the extensive use of other mnemonics throughout the 3 systems and I don’t think this list would be of any value. I would recommend that a test dictionary clean up be performed by each region using guidelines provided. Once the cleanup is complete the creation of the following reports would expedite the creation of a regional lab dictionary as well as the mapping of test codes to pCLOCD.

1. pCLOCD codes laboratory tests using 6 different characteristics therefore it is possible to have the same laboratory test with 2 different codes that would need to have different mnemonics in Meditech. To facilitate creating a regional lab test dictionary and to provide the tools necessary to map tests to pCLOCD it is recommended that a list of tests for each laboratory section (i.e. chemistry, haematology) in each region be developed that would include the following information some of which could be downloaded to an excel sheet using NPR.
   • Common term (Y/N)
   • Name
   • Report name
   • Normal range
   • Units of measure
   • Meditech method
   • Property measured (pCLOCD character-table A)

2. Although some panel/group type tests are standardized common terms (i.e. CBC) many panel/group type tests are used for ease of ordering and can be related to a specific physician, clinic etc. making them difficult to standardize. Therefore a list of panel and group type tests including the individual tests contained in each needs to be created for each Meditech system so they can be discussed and evaluated to determine how and if they can be standardized. It should also be noted that many of these panels are not in pCLOCD and therefore the panel name will not appear in the JLIS web viewer. The name of group type tests do not appear on reports and some consideration should be given to weather or not some panels should be changed to group type tests.

OTHER DICTIONARIES

The following other dictionaries linked to the test dictionary should be evaluated and discussed by key stakeholders to determine if mnemonics should be standardized.

➢ Methods
➢ Barcode symbologies and label formats.
➢ Container mnemonics
RECOMMENDED MNEMONIC DEVELOPMENT GUIDELINES

- Common terms may be used, e.g., PT for Prothrombin Time.
- For ease of lookup and ordering, a mnemonic should contain upper case letters and not begin with a number or symbol.
- Lab tests that begin with a number or are associated with a time should have the number or time at the end rather than the beginning of the mnemonic, e.g., 17 Hydroxyprogesterone = HYDRPR17 or 2 Hour Glucose = GLUCOS2H.
- Antibody type tests should not begin with Anti or an abbreviation of Anti and should end with AB.
- Prefix tests only orderable as part of a panel with ZZ so they are not available in general test population on lookup.
- Test name and abbreviations should be entered using upper case letters.
- Create mnemonics using the following formula:
  - Test names containing 1 word
    1. First 6 letters of test name.
    2. If developed mnemonic is already in use add subsequent letters until the mnemonic is unique.
    3. When developing mnemonics for a 1 word tests prefaced with a word that is used in several other test names where the second half of the word is needed to effectively represent the test use the 2 word guidelines, e.g., 17 Hydroxyprogesterone = HYDRPR17.
  - Tests names containing 2 words
    1. 4 letters of first word and 2 letters of second word.
    2. If developed mnemonic is already in use add subsequent letters from the second word until the mnemonic is unique.
  - Test names containing 3 or more words
    1. 4 letters of first word, 2 letters of second word, 2 letters of third word and 1 letter of any subsequent words.
    2. If developed mnemonic is already in use add subsequent letters from the last word until the mnemonic is unique.
COORDINATING CHANGING MNEMONICS

DICTIONARY LINKS

Changing tests mnemonics in a live system will require coordination with other departments as well as other facilities if linked by Medinet. Order Entry lab mnemonics will have to be mapped to the new laboratory mnemonics as they are changed. Medinet order and result codes will also have to be changed to reflect the new test mnemonic. Some testing with Medinet needs to be done to determine if tests already ordered but not yet resulted will be affected. There are other dictionaries within Meditech that may be affected as well. The following table illustrates possible mnemonic links:

<table>
<thead>
<tr>
<th>Possible Dictionary Links</th>
<th>Update Automatically</th>
<th>Requires user Intervention</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>OE Procedure Dictionary</td>
<td></td>
<td>✓</td>
<td>Map to lab mnemonic as they are changed</td>
</tr>
<tr>
<td>Medinet order &amp; result codes (LIS test dictionary of site linked by medinet)</td>
<td></td>
<td>✓</td>
<td>All facilities linked with Medinet will need to change order &amp; result codes to new mnemonic of referral site.</td>
</tr>
<tr>
<td>LIS Rules</td>
<td></td>
<td>✓</td>
<td>Test mnemonics wrote into a rule will not change automatically and have to be manually changed.</td>
</tr>
<tr>
<td>LIS Analyzer Type</td>
<td>✓</td>
<td></td>
<td>Test mnemonics attached to a calculation will change automatically however calculations should be rebuilt using the rebuild routine to ensure correct functionality</td>
</tr>
<tr>
<td>LIS Calculations</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIS Entry Screens</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIS Order Group</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profile/Group (LIS test dictionary)</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIS Report</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIS Selection Profiles</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIS Statistic Profiles</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIS Std/Control</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIS Test View Group</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIS Worksheets</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PROCEDURES FOR EDITING TEST DICTIONARIES

TEST DICTIONARY CLEAN-UP

Dictionary clean-up should include, but not be limited to, the following:

- **Inactive tests no longer in use.** If test is made not orderable to give users time to acclimate to changes set test up using the guidelines for Recreating/Inactivating Tests included in this report.

- **Remove other mnemonics.** Presently some tests have up to 4 other mnemonics attached to it allowing users to order tests 5 different ways. A test should have only 1 mnemonic so all users are ordering test the same way.

- **Review test names** to ensure they are representative of the laboratory procedure they are ordering and are enter using upper case letters.

PROCEDURE FOR RECREATING / INACTIVATING TESTS

- All test dictionary edits should be made in Meditech test system and required testing for correct system functionality be completed before edits are move to Meditech live system.

- Changing print numbers
  - **Recreate Test**
    - Add XX at the beginning of the test mnemonic and change Active to "N"
    - Enter new print number and copy old test. Enter mnemonic and make any necessary changes.
  - **Renumber Test Routine**
    - This routine will allow you to change the test print # and the test mnemonic.
    - The system will add XX to old test mnemonic and inactivate the test.
    - A test inactivated using this routine CANNOT BE REACTIVATED and therefore cannot be included on some Meditech reports.

- Tests no longer in use or replaced by another test
  - Add XX to the end of the test name on page 1 of test dictionary. This will identify it to be inactivated at a later date.
  - Change Orderable prompt on page 1 of test dictionary to "N".
  - In No Order Message on page2 enter an appropriate message telling user that test is no longer in service or giving them the mnemonic of the replacement test.
  - Enter date changes made in the user notes on page 4 of the test dictionary.
REGIONAL LABORATORY REPORTS RECOMMENDATIONS

Meditech laboratory patient reports for Eastern Health St. John's, Eastern Health Avalon and Eastern Health Peninsula's have been reviewed and were found to contain essentially the same information with the exception of the doctor fields. I would suggest that there be some discussion among key stakeholders that would include the following issues:

- Corporation/Facility headers
- The placement of fields on the report
- Unit# and MCP Number
  - At present the unit # and MCP # are different for Peninsulas and Avalon but the same for St. John's. Some reports have the MCP # on the report 3 times in different fields (Unit#, MCP# & in the comment field).
- Doctors
  - Prim Care Phys, Attend Physician, Family Physician And Other Provider can be entered in admissions.
  - Reg Dr. (admissions Attend Physician cannot be edited in lab), Submit Dr. & Other Dr. are on the lab requisition.
  - At present Avalon and St. John's excludes the Family Physician from the lab requisition and includes the Attend Physician and Submit Dr. on their reports. Peninsulas does not exclude the family physician from the lab requisition and includes the Attend Physician and Family Physician on their reports. Peninsulas sends a copy of their report to Family Physician if different from the Attend Physician whereas St. John's and Avalon does not. I would suggest that a regional policy is developed giving direction on the distribution of laboratory reports.
- The CCHSA National Standards for Medical Laboratories contains guidelines for reporting results. These should be reviewed and discussed to ensure reports contain the required information.
PROPOSED TEST DICTIONARY ENTER/EDIT REGIONAL POLICY

Procedure:

- Access to LIS test dictionaries will be given only at the request of the laboratory director or his designate and will be restricted to laboratory personnel with training in the functionality and interactions with other LIS dictionaries and Meditech modules.
- New tests created or test edits that may affect patient care or the flow of information to and from other Meditech modules (reference LIS procedure manual) will be approved by a person or persons appointed by the laboratory director.
- A list of personnel responsible for the approval of test dictionary enter/edits as well as other personnel with dictionary access and contacts in other modules that may need to be informed of dictionary enter/edits will be supplied to all persons with dictionary access.
- Personnel making enter/edits to test dictionaries are responsible for populating all required fields as well as informing all personnel within laboratory and key personnel in other modules that may be affected by changes.
- All LIS test dictionary edits and newly created tests will be implemented in the LIS test system and tested to establish proper functionality and interaction with other dictionaries and modules before they entered into the live system (reference LIS procedure manual).
### Table A: Kind of Property (LOINC®)

<table>
<thead>
<tr>
<th>Kind of Property</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration</td>
<td>An amount divided by a volume i.e. mg/dl, gm</td>
<td>Concentration: An amount divided by mass i.e. mg/gm sample, mg/total protein</td>
</tr>
<tr>
<td>Contents</td>
<td>An amount divided by mass i.e. mg/gm sample, mg/total protein</td>
<td>Fractions: Ratios of a part over a whole (usually reported as percents)</td>
</tr>
<tr>
<td>Rates</td>
<td>A measure per time period i.e. mg/day(MRAT), clearances(VRAT)</td>
<td>Ratios: Resulted reported as one measure divided by another. Numerator and denominator must come from same system</td>
</tr>
<tr>
<td>Catalytic Activity</td>
<td>Observations that report enzyme activity</td>
<td>Entitic – measure per entity(cells, receptors etc.) i.e. per 10^6 RBC's</td>
</tr>
<tr>
<td>Mass</td>
<td>Observations with mass(milligrams, grams, etc.) in the numerator of their units of measure</td>
<td>Substance – Observations with moles or milliequivalents in the numerator of their units of measure</td>
</tr>
<tr>
<td>Number</td>
<td>Counts i.e. WBC reported as WBCs divided by volume of blood</td>
<td>Arbitrary Unit Measure – Arbitrary units in the numerator of their units of measure</td>
</tr>
<tr>
<td>Volumes</td>
<td></td>
<td>Other Properties</td>
</tr>
</tbody>
</table>

**Catalytic Activity – Observations that report enzyme activity**

- **CACT**: Catalytic Activity
- **CCNC**: Catalytic Concentration
- **CCRTO**: Catalytic Concentration Ratio
- **CCNT**: Catalytic Content
- **CRR**: Catalytic Fraction
- **CRAT**: Catalytic Rate
- **RICCNC**: Relative Catalytic Concentration

**Entitic – measure per entity(cells, receptors etc.) i.e. per 10^6 RBC's**

- **ENTCAT**: Entitic Catalytic Activity
- **ENTLEN**: Entitic Length
- **ENTMASS**: Entitic Mass
- **ENTNUM**: Entitic Number
- **ENTVOL**: Entitic Volume

**Mass – Observations with mass(milligrams, grams, etc.) in the numerator of their units of measure**

- **MASS**: Mass
- **MARIC**: Mass Aeric
- **MCNC**: Mass Concentration
- **MCNTO**: Mass Concentration Ratio
- **MCNT**: Mass Content
- **MFR**: Mass Fraction
- **MRAT**: Mass Rate
- **MRTO**: Mass Ratio
- **RMCNC**: Relative Mass Concentration
- **THRMCNC**: Threshold Mass Concentration

**Substance – Observations with moles or milliequivalents in the numerator of their units of measure**

- **RISCNC**: Relative Substance Concentration
- **SUB**: Substance Amount
- **SCNC**: Substance Concentration
- **SCRTO**: Substance Concentration Ratio
- **SCNT**: Substance Content
- **SFR**: Substance Fraction
- **SRAT**: Substance Rate
- **SRTI**: Substance Ratio

**Number – Counts i.e. WBC reported as WBCs divided by volume of blood**

- **NUM**: Number
- **NARIC**: Number Aeric (number per area)
- **NCNC**: Number Concentration(count/vol)
- **NCNT**: Number = Count/Mass
- **NFR**: Number Fraction
- **NRAT**: Number Rate=Count/Time
- **NRTO**: Number ratio
- **LNCNC**: Log Number Concentration

**Arbitrary Unit Measure – Arbitrary units in the numerator of their units of measure**

- **ACNC**: Arbitrary Concentration
- **ACNT**: Arbitrary Content
- **THRACNC**: Threshold Arbitrary Concentration
- **ARAT**: Arbitrary Rate
- **LACNC**: Log Arbitrary Concentration
- **RIACNC**: Relative Arbitrary Concentration

**Volumes**

- **VOL**: Volume
- **VCNT**: Volume Content
- **VFR**: Volume Fraction
- **VRAT**: Volume Rate
- **VRATC**: Volume Rate Content
- **VRATR**: Volume Rate Ratio
- **VRC**: Volume Ratio
- **RELVOL**: Relative Volume
- **REVLV**: Relative Volume Rate
- **AREN**: Energy/Area
- **ARED**: Resistance Area
- **ARES**: Resistance Area
- **ARVOL**: Volume/Area
- **ARVOLR**: Volume Rate/Ratio

**Other Properties**

- **APER**: Appearance
- **IMP**: Impression/Interpretation of study
- **MORPH**: Morphology
- **OSMOL**: Osmolality
- **PCTL**: Percentile
- **PRID**: Presence or Identity
- **PPRES**: Pressure (partial)
- **RDE**: Relative Density
- **RELRT**: Relative Ratio
- **SATFR**: Saturation Fraction
- **TEMP**: Temperature
- **THRES**: Threshold
- **TI**: Dilution Factor (titre)
- **TYPE**: Type