# Table of Contents

1.0 Introduction ......................................................................................................... 1  
2.0 LOINC and Related Dictionaries Updated ........................................................ 2  
3.0 VA Lab Patches .................................................................................................. 3  
   3.1 Automated Lab Instruments (LA) Patches ......................................................... 3  
   3.1.1 Sequence 56, LA*5.2*68: Health Data Repository (HDR) and  
         Commercial Off the Shelf (COTS) .................................................................... 3  
   3.2 Lab Service (LR) Patches ........................................................................ 3  
   3.2.1 Sequence 313, LR*5.2*398: LRPHLIST for Mixed Operating System .... 3  
   3.2.2 Sequence 315, Patch LR*5.2*397: Fix for Anatomic Pathology  
         Reports; Results Alerts ................................................................................ 3  
   3.2.3 Sequence 316, Patch LR*5.2*396: Fixes For [LRENTER] &  
         [LRCAPR1] ........................................................................................................ 4  
   3.2.4 Sequence 317, Patch LR*5.2*399: Syntax Error In DSS Laboratory  
         Extract ........................................................................................................... 4  
   3.2.5 Sequence 318, Patch LR*5.2*402: Correction to LRENTER & Modify  
         an Existing Data Name ................................................................................... 4  
   3.2.6 Sequence 319, Patch LR*5.2*403: Update Data Extract Fields  
         for DSS ............................................................................................................. 4  
   3.2.7 Sequence 320, Patch LR*5.2*401: VBEC5 Related Lab Updates ........ 5  
   3.2.8 Sequence 321, Patch LR*5.2*407: Address 2 LOINC Mapping  
         Problems ........................................................................................................ 5  
   3.2.9 Sequence 322, Patch LR*5.2*406: Some Alerts for Lab Test Results  
         Are Not Being Sent ......................................................................................... 5  
   3.2.10 Sequence 323, Patch LR*5.2*408: Disable VistA Blood Bank  
         Entry/Edit Options (VistA Only) ........................................................................ 5  
   3.2.11 Sequence 324, Patch LR*5.2*410: DD and Option Modifications .... 5  
   3.2.12 Sequence 325, Patch LR*5.2*405: HOWDY Computerized Phlebotomy  
         Login Process (Disabled) ............................................................................... 6  
   3.2.13 Sequence 326, Patch LR*5.2*413: Some Anatomic Pathology Routine  
         Fixes ................................................................................................................ 6  
   3.2.14 Sequence 327, Patch LR*5.2*411: Fix Problem with Deletion of  
         Preselected Lab Test/Patient Lists ................................................................... 6  
   3.2.15 Sequence 328, Patch LR*5.2*419: Ordered Tests Filed Under Wrong  
         Patient ............................................................................................................ 7  
   3.2.16 Sequence 329, Patch LR*5.2*415: Modify LRWLST1 Routine To  
         Address In-Common Accessioning .................................................................. 7  

4.0 New Routines ...................................................................................................... 8  

5.0 Modified Routines .............................................................................................. 9  

6.0 Modified Files .................................................................................................... 10  
   6.1 LABORATORY TEST (#60) File ..................................................................... 10
<table>
<thead>
<tr>
<th>Section</th>
<th>File/Option</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2</td>
<td>TOPOGRAPHY FIELD (#61) File</td>
<td>10</td>
</tr>
<tr>
<td>6.3</td>
<td>MORPHOLOGY FIELD (#61.1) File</td>
<td>10</td>
</tr>
<tr>
<td>6.4</td>
<td>ETIOLOGY FIELD (#61.2) File</td>
<td>10</td>
</tr>
<tr>
<td>6.5</td>
<td>FUNCTION FIELD (#61.3) File</td>
<td>10</td>
</tr>
<tr>
<td>6.6</td>
<td>DISEASE FIELD (#61.4) File</td>
<td>10</td>
</tr>
<tr>
<td>6.7</td>
<td>PROCEDURE FIELD (#61.5) File</td>
<td>10</td>
</tr>
<tr>
<td>6.8</td>
<td>OCCUPATION FIELD (#61.6) File</td>
<td>10</td>
</tr>
<tr>
<td>6.9</td>
<td>COLLECTION SAMPLE (#62) File</td>
<td>10</td>
</tr>
<tr>
<td>6.10</td>
<td>ANTIMICROBIAL SUSCEPTIBILITY (#62.06) File</td>
<td>10</td>
</tr>
<tr>
<td>6.11</td>
<td>AUTO INSTRUMENT (#62.4) File</td>
<td>10</td>
</tr>
<tr>
<td>6.12</td>
<td>LAB DATA (#63) File</td>
<td>10</td>
</tr>
<tr>
<td>6.12.1</td>
<td>&quot;CH&quot; Subscript (#63.04)</td>
<td>11</td>
</tr>
<tr>
<td>6.12.2</td>
<td>&quot;MI&quot; Subscript (#63.05)</td>
<td>11</td>
</tr>
<tr>
<td>6.12.3</td>
<td>&quot;MI&quot; Organism Subfile (#63.3)</td>
<td>11</td>
</tr>
<tr>
<td>6.12.4</td>
<td>ANTIBIOTIC LEVEL Subfile (#63.42)</td>
<td>11</td>
</tr>
<tr>
<td>6.13</td>
<td>LAB ELECTRONIC CODES File</td>
<td>12</td>
</tr>
<tr>
<td>6.14</td>
<td>WKLD SUFFIX CODES File</td>
<td>12</td>
</tr>
<tr>
<td>6.15</td>
<td>ACCESSION (#68) File</td>
<td>12</td>
</tr>
<tr>
<td>6.16</td>
<td>LAB ORDER ENTRY (#69) File</td>
<td>12</td>
</tr>
<tr>
<td>6.17</td>
<td>LAB LOINC (#95.3) File</td>
<td>12</td>
</tr>
<tr>
<td>6.18</td>
<td>LAB LOINC COMPONENT (#95.31) File</td>
<td>12</td>
</tr>
<tr>
<td>6.19</td>
<td>HL7 Application Parameter (#771)</td>
<td>12</td>
</tr>
<tr>
<td>6.20</td>
<td>HL7 Logical Link (#870)</td>
<td>12</td>
</tr>
<tr>
<td>6.21</td>
<td>IHS UCUM (#90475.3) File</td>
<td>12</td>
</tr>
<tr>
<td>6.22</td>
<td>IHS LAB CPT CODE (#9009021) File</td>
<td>12</td>
</tr>
<tr>
<td>6.23</td>
<td>IHS LAB TRANSACTION LOG (#9009022) File</td>
<td>12</td>
</tr>
<tr>
<td>6.24</td>
<td>BLR REFERENCE LAB (#9009026) File</td>
<td>13</td>
</tr>
<tr>
<td>6.25</td>
<td>BLR REFERENCE LAB ORDER/ACCESSION (#9009026.3) File</td>
<td>13</td>
</tr>
<tr>
<td>6.26</td>
<td>BLR REFERENCE LAB MU SEGMENT DEFINITION (#9009026.4) File</td>
<td>13</td>
</tr>
<tr>
<td>6.27</td>
<td>BLR REFERENCE LAB MONITOR PARAMETERS (#9009026.5) File</td>
<td>13</td>
</tr>
<tr>
<td>6.28</td>
<td>BLR MASTER CONTROL (#9009029) File</td>
<td>13</td>
</tr>
<tr>
<td>7.0</td>
<td>New Files</td>
<td>14</td>
</tr>
<tr>
<td>7.1</td>
<td>BLR REFERENCE LAB MU SEGMENT DEFINITION</td>
<td>14</td>
</tr>
<tr>
<td>7.2</td>
<td>BLR REFERENCE LAB MONITOR PARAMETERS</td>
<td>14</td>
</tr>
<tr>
<td>7.3</td>
<td>HOWDY SITE (#69.86) FILE</td>
<td>14</td>
</tr>
<tr>
<td>7.4</td>
<td>HOWDY SPECIMEN TIMES BY UID (#69.87) FILE</td>
<td>14</td>
</tr>
<tr>
<td>8.0</td>
<td>New Options</td>
<td>15</td>
</tr>
<tr>
<td>8.1</td>
<td>BLR 62.49 HL7 SEGMENTS - Display File 62.49 HL7 Segments</td>
<td>15</td>
</tr>
<tr>
<td>8.2</td>
<td>BLR ADD COMPLETED DATE – Put Completed Date on Accession's tests</td>
<td>15</td>
</tr>
<tr>
<td>8.3</td>
<td>BLR CC PARAMETER EDIT - BLR CC DATA Parameter Edit</td>
<td>15</td>
</tr>
<tr>
<td>8.4</td>
<td>BLR LAB TESTS REF RANGES - Laboratory Test (#60) File’s Reference Ranges</td>
<td>15</td>
</tr>
</tbody>
</table>
8.5 BLR LRAS MICRO REPORT - Accession IHS Lab Microbiology Report ........................................................................................................ 15
8.6 BLR MU2 MICRO REPORT - IHS Lab Microbiology Report ................................................................. 16
8.7 BLR REFLAB HL7 TABLE LOOKUP - Display Data in HL7 or Other Tables ........................................................................................................ 16
8.8 BLR REFLAB MONITOR PARAMS - Assign namespaces for Reference Lab Monitor ........................................................................................................ 16
8.9 BLRRLRPC - Reference Lab Interface Monitor Context ........................................................................................................ 16
8.10 BLRSCRNTASKS - Determine if Required RPMS Lab Options Tasked ........................................................................................................ 16

9.0 VA Patches New Options ......................................................................................................................... 17
9.1 LA*5.2*68 – Health Data Repository (HDR) and Commercial Off the Shelf (COTS) ........................................................................................................ 17
9.1.1 LA7 HDR RECOVER - Recover/Transmit Lab HDR Result Messages ................................................................. 17
9.1.2 LRLIAISON - Lab Liaison Menu ........................................................................................................ 17
9.2 LR*5.2*405 - HOWDY Computerized Phlebotomy Login Process ........................................................................................................ 17
9.2.1 LRHY HOWDY BOT - LRHY SET HOWDY USER ........................................................................ 18
9.2.2 LRHY HOWDY MAIN MENU - HOWDY MAIN MENU ........................................................................ 18
9.2.3 LRHY HOWDY PPOC MAIN MENU - HOWDY PPOC MAIN MENU ................................................................. 18
9.2.4 LRHY PATIENT CARD SCAN - SCAN PATIENT CARD (PPOC) ........................................................................ 18
9.2.5 LRHY PATIENT CARD SCAN - SCAN PATIENT CARD ........................................................................ 18
9.2.6 LRHY PATIENT WAIT TIME - PATIENT WAIT TIME ........................................................................ 18
9.2.7 LRHY PHLEBOTOMY LOG - PHLEBOTOMY LOG ........................................................................ 18
9.2.8 LRHY PPOC LABEL PRINT - PRINT PPOC LABEL ........................................................................ 18
9.2.9 LRHY SCAN SPECIMENS INT - SCAN SPECIMENS INTO LAB ........................................................................ 18
9.2.10 LRHY SITE FILE EDIT - EDIT HOWDY SITE FILE ........................................................................ 18
9.2.11 LRHY TRACK COLLECTION - TRACK COLLECTION ........................................................................ 19
9.3 LR*5.2*410 - DD AND OPTION MODIFICATIONS ........................................................................ 19
9.3.1 LR WKLD REQUEST - Requesting Center Dictionary ........................................................................ 19
9.3.2 LR WKLD SERVICE - Service Dictionary ......................................................................................... 19

10.0 New Security Keys .............................................................................................................................. 20
10.1 BLRMU2MICRO - Meaningful Use Stage 2 Micro ........................................................................ 20
10.2 LRHYKEY – Used By Howdy .......................................................................................................... 20

11.0 New Protocols .................................................................................................................................... 21
11.1 BLR SELECT SNOMED Protocol .......................................................................................................... 21
11.2 BLR SNOMED Menu ............................................................................................................................ 21
11.3 LA7 LAB RESULTS ACTION - Lab process results for HL7 messaging .......................................................................................................... 21
11.4 LA7 LAB RESULTS AVAILABLE (EVN) - Lab Results Available Event ...................................................................................................... 21
11.5 LA7 LAB RESULTS TO HDR (SUB) - Send Lab Results to HDR .......................................................................................................... 21
11.6 LR7O ALL EVSENDD RESULTS - LAB RESULTS => EXTERNAL PACKAGE ...................................................................................................... 22
12.0 NEW LIST TEMPLATE: BLR SNOMED SELECT ...................................................... 23
13.0 NEW PARAMETER DEFINITION: BLR CC DATA ............................................. 24
14.0 New Remote Procedures ............................................................................... 25
   14.1 BLRRL GET SITE PARAMETERS ........................................................ 25
   14.2 BLRRL GET STATUS ........................................................................... 25
   14.3 BLRRL INTERFACE START/STOP ..................................................... 25
15.0 New LA7 Message Parameter ....................................................................... 26
Contact Information .......................................................................................... 27
1.0 Introduction

This document lists the various routines, options, and other technical details regarding the updates to the RPMS Lab module via IHS Lab Patch 1033 (LR*5.2*1033).
2.0 LOINC and Related Dictionaries Updated

IHS Lab Patch 1033 updates the following files:

- LAB LOINC (#95.3)
- LAB LOINC COMPONENT (#95.31)
- LAB ELECTRONIC CODES (#64.061)
- WKLD SUFFIX CODES (#64.2)

The Lab LOINC files are updated to LOINC 2.40.
3.0 VA Lab Patches

There are numerous VA Lab patches included in this IHS Lab Patch that address various issues. Some are required for subsequent VA Lab patches but are not relevant to IHS, and others are updates and/or fixes to current RPMS Lab functionality.

3.1 Automated Lab Instruments (LA) Patches

3.1.1 Sequence 56, LA*5.2*68: Health Data Repository (HDR) and Commercial Off the Shelf (COTS)

This patch supports the VA Health Data Repository (HDR) effort, allowing changes to LAB DATA file (#63) to be transmitted to the HDR via a VistA Laboratory HL7 Result (ORU) message.

Additionally, it provides the capability for the transmission of the HL7 ORU message containing patient laboratory results to subscribers of the HL7 event protocol LA7 LAB RESULTS AVAILABLE (EVN) as these results are made available within the Laboratory package. The following subscripts are supported by the event: "CH", "MI", "SP", "CY", "EM".

3.2 Lab Service (LR) Patches

3.2.1 Sequence 313, LR*5.2*398: LRPHLIST for Mixed Operating System

This patch fixes an issue in option LRPHLIST due to forced queuing of the print job at sites supporting mixed operating systems.

3.2.2 Sequence 315, Patch LR*5.2*397: Fix for Anatomic Pathology Reports; Results Alerts

This patch addresses the following issues by modifying the necessary routines:

1. The Anatomic Pathology Turnaround Time report yields incorrect calculation of days sometimes when a holiday occurs mid-week.

2. Results alerts are being sent for patients from the REFERRAL PATIENT file when they should not be.

3. Modifying a released Surgical Pathology report can lead to incorrectly stored data.
3.2.3 Sequence 316, Patch LR*5.2*396: Fixes For [LRENTER] & [LRCAPR1]

This patch addresses the following issues by modifying the necessary routines:

1. When entering results for a Lab test, a response to the “CONC(ug/ml)” prompt of more than 20 characters will result in an <UNDEFINED> error.

2. The wrong informational message is displayed when a test is canceled after an abnormal result has been entered.

3. Because of a flaw in the date logic, the Workload Report shows "*** NO DATA TO REPORT ***" for accession areas whose ACCESSION file (#68) CLEAN UP field (#.03) is set to 'Y' (yearly).

3.2.4 Sequence 317, Patch LR*5.2*399: Syntax Error In DSS Laboratory Extract

This patch addresses the following issues by modifying the necessary routines:

1. The DSS Laboratory Extract encounters a <SYNTAX> error when a lab result contains a semi-colon (;)

2. A <SUBSCRIPT> error occurs when a user attempts to exit (^) option LR LOINC UNMAP/DELETE DEFAULT at the RESULT NLT CODE prompt or when there is no RESULT NLT CODE on file and the user <returns> through this prompt.

3.2.5 Sequence 318, Patch LR*5.2*402: Correction to LRENTER & Modify an Existing Data Name

This patch addresses the following issues by modifying the necessary routines:

1. The option MODIFY AN EXISTING DATA NAME allows for the modification of the input parameters for data elements that are not DATA NAMES which can lead to a corrupted database.

2. The option LRENTER (Enter/verify/modify data (manual)) sometimes prompts the user to select an accession area twice.

3.2.6 Sequence 319, Patch LR*5.2*403: Update Data Extract Fields for DSS

This patch adds new fields to the WKLD LOG FILE (#64.03) file in order for the LABORATORY EXTRACT for FY11 to extract requested data.
3.2.7 Sequence 320, Patch LR*5.2*401: VBECS Related Lab Updates
This patch is included only because other VA Lab Patches depend upon it. It does not impact RPMS.

3.2.8 Sequence 321, Patch LR*5.2*407: Address 2 LOINC Mapping Problems
This Lab Service patch addresses 2 LOINC mapping issues by modifying the necessary routines:
1. When exiting the option "Map Lab Tests to LOINC Codes" after no matches are found related to an affirmative response to the prompt "Do you want to see possible LOINC code matches?", an <UNDEFINED> error results.
2. The option to map a default LOINC code and the option to unmap a default LOINC code use the same routines. Sometimes the code gets confused and prompts one to "unmap" when one is in the "map" option.

3.2.9 Sequence 322, Patch LR*5.2*406: Some Alerts for Lab Test Results Are Not Being Sent
This patch addresses Patient Safety Issue PSPO #1384 which involves critical lab test result alerts. When a lab test result is verified and that result lies outside the normal boundaries defined for the test, alerts are generated that are sent to the physicians who are responsible for the patient's care. In some cases these alerts are not being generated. This patch resolves the issue by modifying the appropriate routines.

3.2.10 Sequence 323, Patch LR*5.2*408: Disable VistA Blood Bank Entry/Edit Options (VistA Only)
This patch is included only because other VA Lab Patches depend upon it. It is only activated on VistA systems that have installed the VBECS package.
It does not disable anything in RPMS.

3.2.11 Sequence 324, Patch LR*5.2*410: DD and Option Modifications
This patch addresses the following issues by modifying the necessary data dictionary or routines:
1. The code contained in FileMan to delete the CANCELLED BY field (#10) has faulty syntax which leads to a <SUBSCRIPT> error.
2. The routines which execute options Service Dictionary [LR WKLD SERVICE] and Requesting Center Dictionary [LR WKLD REQUEST] are reversed.
3. During extraction of lab data for the Decision Support Software (DSS), it was discovered that some lab test names included a tilde (~) or an exclamation point (!) which caused the record parser to incorrectly identify the end of the record and thus skip pertinent data.

3.2.12 Sequence 325, Patch LR*5.2*405: HOWDY Computerized Phlebotomy Login Process (Disabled)

This patch is included only because other VA Lab Patches depend upon it.

To utilize this update within RPMS would require major hardware and software setups and, as such, it is included in RPMS in a disabled state.

3.2.13 Sequence 326, Patch LR*5.2*413: Some Anatomic Pathology Routine Fixes

This patch addresses the following issues related to the Anatomic Pathology area of the Lab package by modifying the necessary routines:

1. When using option LRAPMOD (Print path modifications) an <UNDEFINED> error occurs.

2. When a date is typed in the EXPIRATION DATE field (#3), of the PERSON CLASS MULTIPLE file (#200.05), of the NEW PERSON file (#200), for a provider, that same provider will not be able to verify/electronically sign Anatomic Pathology reports. This happens even if the date is a future date.

3. If more than one Special Studies selection is included in an Anatomic Pathology Report, the text of the subsequent Special Studies is not stored properly in the TIU document and thus doesn't display in CPRS.

3.2.14 Sequence 327, Patch LR*5.2*411: Fix Problem with Deletion of Preselected Lab Test/Patient Lists

This patch addresses the following issues by modifying the necessary routines:

1. When trying to accession an order user gets the message "TEST NAME does not have an appropriate accession area. Order xxxxx IS NOT ACCESSIONED."

2. The GROUP DATA REVIEW [LRGVP] option does not always show the proper report routing location.

3. <UNDEFINED> error occurs when trying to delete old user-defined patient/test lists.
3.2.15 Sequence 328, Patch LR*5.2*419: Ordered Tests Filed Under Wrong Patient

This patch addresses the following issues by modifying the necessary routines:

1. A lab test ordered through CPRS may be misplaced on an order for the wrong patient in LAB ORDER ENTRY file (#69).

2. The LOCK timeout in routine LR7OF5 is not in compliance with SACC guidelines.

3.2.16 Sequence 329, Patch LR*5.2*415: Modify LRWLST1 Routine To Address In-Common Accessioning

This patch is a VM patch that addresses a problem in the Lab package related to accessioning with in-common accession areas. When an "in-common" accession area is added to an existing accession area, it is possible that data in file #68 (ACCESSION) will be overwritten and two patients will have the same accession number. This patch will prevent that error from occurring.
## 4.0 New Routines

The following new routines have been added by IHS or by a VA Patch to the IHS Lab module.

<table>
<thead>
<tr>
<th>Routine1</th>
<th>Routine2</th>
<th>Routine3</th>
<th>Routine4</th>
<th>Routine5</th>
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5.0 Modified Routines

The following routines have been modified by IHS or by a VA Patch in order to prevent errors and/or add new functionality.

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6.0 **Modified Files**

The following is a list of the files that will be updated by either IHS Lab patch 1033 or one of the included VA Patches.

6.1 **LABORATORY TEST (#60) File**

New field AMA COMPLIANT/BILLABLE PANEL (#508) field added to be able to pass data to the VA Patient Care Encounter (PCE) module. Not used by IHS.

6.2 **TOPOGRAPHY FIELD (#61) File**

6.3 **MORPHOLOGY FIELD (#61.1) File**

6.4 **ETIOLOGY FIELD (#61.2) File**

6.5 **FUNCTION FIELD (#61.3) File**

6.6 **DISEASE FIELD (#61.4) File**

6.7 **PROCEDURE FIELD (#61.5) File**

6.8 **OCCUPATION FIELD (#61.6) File**

6.9 **COLLECTION SAMPLE (#62) File**

6.10 **ANTIMICROBIAL SUSCEPTIBILITY (#62.06) File**

6.11 **AUTO INSTRUMENT (#62.4) File**

6.12 **LAB DATA (#63) File**

Various new fields have been added.
6.12.1 "CH" Subscript (#63.04)

6.12.1.1 RELEASING SITE

6.12.1.2 SPECIMEN CONDITION

6.12.1.3 RESULT COPIES TO

6.12.1.4 RELEVANT CLINICAL INFORMATION

6.12.1.5 RESULTS HANDLING

6.12.1.6 HL7 MESSAGE

6.12.2 "MI" Subscript (#63.05)

6.12.2.1 RELEASING SITE

6.12.2.2 SPECIMEN CONDITION

6.12.2.3 RELEASE DATE

6.12.2.4 HL7 MESSAGE

6.12.3 "MI" Organism Subfile (#63.3)

6.12.3.1 RELEASE DATE

6.12.3.2 STATUS

6.12.3.3 FLAG

6.12.3.4 SUSCEPTIBILITY

6.12.3.5 UNITS

6.12.3.6 INTP

6.12.4 ANTIBIOTIC LEVEL Subfile (#63.42)
6.12.4.1 IHS RESULT DATE

6.12.4.2 IHS REF LAB

6.13 LAB ELECTRONIC CODES File

6.14 WKLD SUFFIX CODES File

6.15 ACCESSION (#68) File

6.16 LAB ORDER ENTRY (#69) File

6.17 LAB LOINC (#95.3) File
Updated with the December 2012 Regenstrief data.

6.18 LAB LOINC COMPONENT (#95.31) File
Updated with the December 2012 Regenstrief data.

6.19 HL7 Application Parameter (#771)
New entries were added to support the VA POC interface.

6.20 HL7 Logical Link (#870)
New entries were added to support the VA POC interface.

6.21 IHS UCUM (#90475.3) File
Updated with the December 2012 Regenstrief data.

6.22 IHS LAB CPT CODE (#9009021) File
Updated to allow the selection of alphanumeric CPT codes.

6.23 IHS LAB TRANSACTION LOG (#9009022) File
Added CLINICAL INDICATOR (#3002) field.
6.24 BLR REFERENCE LAB (#9009026) File
The field length for Ask at Order Result Codes and Result Codes has been expanded to 15 characters.

6.25 BLR REFERENCE LAB ORDER/ACCESSION (#9009026.3) File

6.26 BLR REFERENCE LAB MU SEGMENT DEFINITION (#9009026.4) File

6.27 BLR REFERENCE LAB MONITOR PARAMETERS (#9009026.5) File

6.28 BLR MASTER CONTROL (#9009029) File
7.0 New Files

The following is a list of the files that have been added to the RPMS Lab module by IHS or by VA Patch LR*5.2*405.

7.1 BLR REFERENCE LAB MU SEGMENT DEFINITION
This file was created for MU2 specific HL7 Segment building.

7.2 BLR REFERENCE LAB MONITOR PARAMETERS
This file was created for the Reference Lab Interface monitoring processes.

7.3 HOWDY SITE (#69.86) FILE
This file is used to store the site parameters for the HOWDY check-in software.
It will not be used by IHS.

7.4 HOWDY SPECIMEN TIMES BY UID (#69.87) FILE
This file is used to capture and retain the specimen demographics.
It will not be used by IHS.
8.0 New Options

The following is a list of the new options added to the Option (# 19) file by IHS Lab patch 1033.

The only option not automatically added to the BLR MENU is the BLR CC DATA Parameter Edit.

8.1 BLR 62.49 HL7 SEGMENTS - Display File 62.49 HL7 Segments

This option will display a specific accession's HL7 segments from the LA7 MESSAGE QUEUE (#62.49) file to the screen.

8.2 BLR ADD COMPLETED DATE – Put Completed Date on Accession's tests

This will allow the user to forcefully put completed dates on an accession.

The option is locked with the LRSUPER key.

8.3 BLR CC PARAMETER EDIT - BLR CC DATA Parameter Edit

This will allow editing of the new BLR CC parameter.

If the parameter is set to YES, it will create CC entries in the HL7 outbound messages for Reference Labs based upon the

This option can be placed on any menu, but it is strongly recommended that it be placed on the Lab Supervisor's menu (the LRSUPERVISOR option).

The BLR CC PARAMETER EDIT option is locked with the LRSUPER key.

8.4 BLR LAB TESTS REF RANGES - Laboratory Test (#60) File's Reference Ranges

This will print the File 60 SEX Reference Range Report.

8.5 BLR LRAS MICRO REPORT - Accession IHS Lab Microbiology Report

This will display a modified Interim Micro report for a specific accession.
8.6 BLR MU2 MICRO REPORT - IHS Lab Microbiology Report

This will display patient's micro accessions in a modified Interim Micro report.

8.7 BLR REFLAB HL7 TABLE LOOKUP - Display Data in HL7 or Other Tables

Allows the user to display the values of various HL7 and Other tables.

8.8 BLR REFLAB MONITOR PARAMS - Assign namespaces for Reference Lab Monitor

Allows the user to add entries to the BLR REFERENCE LAB MONITOR PARAMETERS (#9009026.5) file.

8.9 BLRRLRPC - Reference Lab Interface Monitor Context

Deals with the Reference Lab Interface Monitor broker.

8.10 BLRSCRNTASKS - Determine if Required RPMS Lab Options Tasked

This option displays to the screen the report that shows crucial Lab Tasks' TaskMan statuses.
9.0 **VA Patches New Options**

The following is a list of the new options added to the Option (# 19) file by various VA Lab patches included in IHS Lab Patch 1033.

9.1 **LA*5.2*68 – Health Data Repository (HDR) and Commercial Off the Shelf (COTS)**

This patch supports the VA Health Data Repository (HDR) effort, allowing changes to LAB DATA file (#63) to be transmitted to the HDR via a VistA Laboratory HL7 Result (ORU) message.

9.1.1 **LA7 HDR RECOVER - Recover/Transmit Lab HDR Result Messages**

Option to recover from failed Lab HDR ORU Result message generation and/or transmission failure. This option allows the user to select those VistA Laboratory accessions that need to be transmitted to the VA HDR and other subscribers of the VistA Laboratory Result Available HL7 message capability via the protocol Lab Results Available Event [LA7 LAB RESULTS AVAILABLE (EVN)].

If the original message generation/transmission failed due to system or communication problems, then using this option will allow the generation of new HL7 messages with the results associated with the selected accessions. Accessions can be selected using the human-readable accession designation (area abbreviation modified date accession number - "CH 1225 100") or the accession's associated 10 character unique identifier (UID).

9.1.2 **LRLIAISON - Lab Liaison Menu**

The LA7 HDR RECOVER option is added to the LRLIAISON menu.

9.2 **LR*5.2*405 - HOWDY Computerized Phlebotomy Login Process**

Installs the Howdy Computerized Phlebotomy Login Process as an automated laboratory check-in application which can be used within the Veterans Health Information Systems and Technology Architecture (VistA) Laboratory module.

**Note:** This patch will not be utilized by RPMS and is only included due to other VA patches requiring it to be installed.

The following options will be installed with the OUT OF ORDER field filled in.
9.2.1 LRHY HOWDY BOT - LRHY SET HOWDY USER
This option sets the Howdy user that will run the Howdy scan option.

9.2.2 LRHY HOWDY MAIN MENU - HOWDY MAIN MENU
This is the traditional Howdy main menu.

9.2.3 LRHY HOWDY PPOC MAIN MENU - HOWDY PPOC MAIN MENU
This option initiates the Howdy process using the greeting from Howdy site file & prints labels.

9.2.4 LRHY PATIENT CARD SCAN - SCAN PATIENT CARD (PPOC)
This option initiates the Howdy process using the greeting from Howdy site file & prints labels.

9.2.5 LRHY PATIENT CARD SCAN - SCAN PATIENT CARD
This option confirms Patient, displays accessioned tests and allows the Collector to choose test(s) actually collected.

9.2.6 LRHY PATIENT WAIT TIME - PATIENT WAIT TIME
This option displays how long a Patient waits to have a sample drawn.

9.2.7 LRHY PHLEBOTOMY LOG - PHLEBOTOMY LOG
This is the log used to track the collector's phlebotomy performance times.

9.2.8 LRHY PPOC LABEL PRINT - PRINT PPOC LABEL
Labels for collected tests are printed on the designated label printer. This option captures collector and collection date & time.

9.2.9 LRHY SCAN SPECIMENS INT - SCAN SPECIMENS INTO LAB
This option allows the Receiver to scan collected specimen labels in order to capture Lab Receipt Time.

9.2.10 LRHY SITE FILE EDIT - EDIT HOWDY SITE FILE
This option enables the Keyholder to edit the Howdy site file.
9.2.11 LRHY TRACK COLLECTION - TRACK COLLECTION
This option is used to display patient specimen collection demographics.

9.3 LR*5.2*410 - DD AND OPTION MODIFICATIONS
This patch will address the following 3 items:

1. The code contained in FileMan to delete the CANCELLED BY field (#10) has faulty syntax which leads to a <SUBSCRIPT> error.

2. The routines which execute options Service Dictionary [LR WKLD SERVICE] and Requesting Center Dictionary [LR WKLD REQUEST] are reversed.

3. During extraction of lab data for the Decision Support Software (DSS), it was discovered that some lab test names included a tilde (~) or an exclamation point (!) which caused the record parser to incorrectly identify the end of the record and thus skip pertinent data.

9.3.1 LR WKLD REQUEST - Requesting Center Dictionary
This option lists by abbreviation every requesting center (or treating specialty) on file for your site.

Note: Only those treating specialties with abbreviations will be listed by this option. Use [LR WKLD SERVICE] 'Service Dictionary' for a complete listing.

9.3.2 LR WKLD SERVICE - Service Dictionary
This option lists all requesting locations by treating specialties for your site. This option is useful in determining which locations do not have abbreviations entered in the file. The option [LR WKLD REQUEST] 'Requesting Center Dictionary' only lists treating specialties with abbreviations.
10.0 **New Security Keys**

One Security Key for RPMS was added to restrict certain functions to users who are authorized to use them.

There was also one VA Security Key added for the HOWDY software.

10.1 **BLRMU2MICRO - Meaningful Use Stage 2 Micro**

The new BLRMU2MICRO Security Key controls access to the new Meaningful Use Stage 2 Microbiology routines.

10.2 **LRHYKEY – Used By Howdy**

Users can only access the HOWDY software if they have this key.

Since RPMS disables the HOWDY software, the key is superfluous, but is included for completeness.
11.0 New Protocols

Two new protocols were added to the PROTOCOL (#101) File. Both were required for the new ListMan listing of SNOMED codes during the Sign/Symptom ordering process.

Four other protocols were added by various VA Patches.

11.1 BLR SELECT SNOMED Protocol
The Protocol involved in the SNOMED Selection process.

11.2 BLR SNOMED Menu
The Protocol involved with displaying the ListMan display of the SNOMED codes.

11.3 LA7 LAB RESULTS ACTION - Lab process results for HL7 messaging
Action protocol to setup sending lab results to HL7 message subscribers via protocol LA7 LAB RESULTS AVAILABLE (EVN) - Lab Results Available Event. This protocol should be attached to protocol LAB RESULTS => EXTERNAL PACKAGE [LR7O ALL EVSEND RESULTS] which is an extended action protocol triggered by the lab result verification process.

11.4 LA7 LAB RESULTS AVAILABLE (EVN) - Lab Results Available Event
A VistA Laboratory package HL7 ORU result message is created and sent by the HL package for transmission to any subscribers of event protocol LA7 LAB RESULTS AVAILABLE (EVN).

11.5 LA7 LAB RESULTS TO HDR (SUB) - Send Lab Results to HDR
This subscriber protocol is used by the Laboratory package to indicate to the HL package to send laboratory results to the VA Health Data Repository (HDR).

It is disabled in RPMS.
11.6 LR70 ALL EVSEND RESULTS - LAB RESULTS => EXTERNAL PACKAGE

An extended action protocol triggered by the lab result verification process.
12.0 NEW LIST TEMPLATE: BLR SNOMED SELECT

The new List Template, BLR SNOMED SELECT, allows ListMan to display the array passed to it during the Sign/Symptom process.
13.0 NEW PARAMETER DEFINITION: BLR CC DATA

The BLR CC DATA parameter is used to determine if HL7 messages will be sent to a third party during ordering and/or resulting of Lab tests.
14.0 New Remote Procedures

There are three new Remote Procedures that are used by the new Reference Lab Ensemble Monitor routine.

14.1 BLRRL GET SITE PARAMETERS
This parameter returns the Site’s information from File 4.

14.2 BLRRL GET STATUS
This parameter determines the status of interfaces.

14.3 BLRRL INTERFACE START/STOP
Starts or Stops or Recovers Monitors interfaces.
15.0 New LA7 Message Parameter

The new LA7HDR LA7 Message Parameter has been added by VA Lab Patch LA*5.2*68.

It is intended to be used for building HL7 messages to send to the VA's Health Data Repository.

It is not relevant to RPMS and is included for completeness.
Contact Information

If you have any questions or comments regarding this distribution, please contact the OIT Help Desk (IHS).

Phone:  (888) 830-7280 (toll free)
Web:    http://www.ihs.gov/helpdesk/
Email:  support@ihs.gov