



RESOURCE AND PATIENT MANAGEMENT SYSTEM

Laboratory

(BLR, LA, LR)

Addendum to Laboratory Technical Manual

Version 5.2 Patch 1038
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Office of Information Technology (OIT)
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1.0 Introduction

IHS Lab Patch 1038 incorporates changes to the RPMS Lab Package that have either corrected issues that had arisen or implemented requested modifications.

This addendum to the Laboratory Technical Manual guide provides technical details regarding those changes.

It uses the Change Request numbers.

2.0 CR 04843 - Repair the Transaction File Which is Not Receiving the Ref Lab Reference Ranges, Units and Flags for Ref Lab Results

The BLRLINKU routine was not updating the APCDALVR array with the incoming Reference Lab results. A new function, LAHREFR, was created to return the necessary information.

3.0 CR 06862 - Update the eGFR to Utilize the CKD-EPI Calculation to Use as an Option in Lieu of the MDRD Calculation.

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) has published the algorithm for the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) Estimating Glomerular Filtration Rate (eGFR).

The URL, as of January 4, 2016, is:

<http://www.niddk.nih.gov/health-information/health-communication-programs/nkdep/lab-evaluation/gfr/estimating/Pages/estimating.aspx>

This was implemented in RPMS via the creation of a new routine that will interactively create a new delta check.

3.1 The CKD-EPI Algorithm.

The CKD-EPI algorithm, as defined by the NIDDK, is:

$GFR = 141 \times \min(S_{cr}/\kappa, 1)^\alpha \times \max(S_{cr}/\kappa, 1)^{-1.209} \times 0.993^{Age} \times 1.018$ [if female] $\times 1.159$ [if black] where:

S_{cr} is serum creatinine in mg/dL,

κ is 0.7 for females and 0.9 for males,

α is -0.329 for females and -0.411 for males,

min indicates the minimum of S_{cr}/κ or 1, and

max indicates the maximum of S_{cr}/κ or 1.

3.2 BLREXEC3 -- The CKD-EPI Routine.

The BLEXEC3 routine was created to deal with the CKD-EPI calculation. It contains the logic for the new algorithm as well as code that will create a delta check in the Delta Check (#62.1) dictionary.

3.3 The CKD-EPI Delta Check.

The CKD EPI eGFR delta check will be created by users at the site and, as such, no delta check is included in the KIDS.

3.4 The BLR CKD-EPI DELTA CHECK CREATE Option.

The BLR CKD-EPI DELTA CHECK CREATE option is included in the KIDS file and will be placed on the BLRMENU during the post install phase of the installation.

It is the option that sites will use to create the new CKD-EPI delta check.

Detailed instructions regarding the creation of the delta check are included in the *LR*5.2*1038 User's Guide*.

3.5 The BLR CKD-EPI TEST Option.

The BLR CKD-EPI TEST option is included in the KIDS file and will be placed on the BLRMENU during the post install phase of the installation.

It is an option that allows the user to test the CKD-EPI algorithm.

Detailed instructions regarding its use are included in the *LR*5.2*1038 User's Guide*.

4.0 CR 05562 Update the FM 61.2 ETIOLOGY File to Increase the Abbreviation from 5 Characters to 6.

The ABBREVIATION field of the ETIOLOGY FIELD (#61.2) dictionary was modified via FileMan from 5 characters to 6 characters.

5.0 CR 05761- Create a Monitor of the HLZTCP Routine so that when it Stops, Lab Users are Notified

The HLZTCP routine is the RPMS Lab routine that facilitates communication between RPMS and a Laboratory Instrument Interface Manager. It is similar to a daemon in UNIX.

If the HLZTCP is not running, information regarding patient demographics will not be communicated and the information will have to be entered by hand at the instrument, thus slowing down the testing process.

Laboratory personnel had to rely on access to the SYSTEM STATUS option in order to determine if the HLZTCP routine was running. The report produced by the option can be rather lengthy and information could be missed.

The BLRTASKS routine's interactive report, currently accessed via the LABT option on the BLRMENU, was modified to print a line at the bottom of the report that will show the status of the HLZTCP routine.

6.0 CR 05799 - Update of the IHS UCUM File

The IHS UCUM file was updated and included in the KIDS build for LR*5.2*1038.

7.0 CR 05853 - Print Address on Last Page of a Listing on the Interim Report

Logic flaws in the LRRP1 and LRRP2 routines were corrected to ensure the printing of the address footer on the last page of the Interim Report.

8.0 CR 05953 - Technician's Initials Should be Masked as "XXX" When Verifying Lab Results

The LRGV, LRVER3, LRVER4, and LRVR3 routines were modified so that when a user enters their initials approving/editing a result, the initials are masked.

It was determined that asterisks (*) are more commonly used for such tasks and were used in place of "X".

9.0 CR 06291 - Remove "NOW" as the Default Date and Time in Multipurpose Accessioning

The LROE routine was modified to remove the default NOW from the user's prompt, but only during the Multipurpose Accessioning process.

10.0 CR 05795 - Create Logic for IEN and HCPCS Codes

The routine BLRTN was modified and the BLRTNCON routine was created so that the Internal Entry Number of a CPT code from the CPT (#81) file is not sent over to PCC, but that the CPT value is sent instead.

11.0 CR 05464 - EHR POC Routine Age for Two Days

The BLRPOC routine was modified to call the AUPNPAT3 routine that puts suffixes on the AGE variable based on the patient's date of birth.

This was done to allow Mumps code in the Laboratory Test (#60) file's Reference Range fields to determine the age of infants/toddlers as well adults.

The call to AUPNPAT3 is done if-and-only-if the new parameter BLR AGE DETAIL is set to YES. The parameter is a YES/NO parameter.

The parameter is set by the user accessing the new BLRAGEED routine via the new option BLR AGE DETAIL Parameter Edit.

The BLR AGE DETAIL Parameter Edit option is placed on the BLRMENU during the post install phase of the patch with the POCA synonym.

12.0 CR 06572 - TASK for Supervisor Reports

Three supervisor reports were requested to be tasked:

- LRUER - Changes in verified lab data
- LRSORA - Search for high/low values of a test
- LRSORC - Search for critical value flagged tests

12.1 New Routines

Three new routines were created:

- BLRUER – Clone of the LRUER routine.
- BLRSORA Clone of the LRSORA routine.
- BLRSROC Clone of the LRSORC routine.

The new routines use a new dictionary to gather the parameters that are needed.

12.2 New Options

Three new options were created that will allow the three new routines to be tasked.

- IHS LAB BLRUER TASK
- IHS LAB BLRSORA TASK
- IHS LAB BLRSORC TASK

Detailed instructions regarding the use of the new options are included in the *LR*5.2*1038 User's Guide*.

12.3 New Dictionary 90475.7

It was determined that a new dictionary would have to be created in order to store the parameters each report would require.

The following is the standard listing of the new dictionary, the IHS LAB SUPERVISOR TASKED REPORTS PARAMETERS (#90475.7) file

```
STANDARD DATA DICTIONARY #90475.7 --
      IHS LAB SUPERVISOR TASKED REPORTS PARAMETERS FILE  JAN 9,2016@10:26:13
PAGE 1
STORED IN ^BLRLSRP( (1 ENTRY)  SITE: CMBA Database  UCI: CMBA,CMBA

DATA          NAME          GLOBAL          DATA
ELEMENT       TITLE         LOCATION       TYPE
-----
-----
```

```

CROSS REFERENCED BY: NAME(B)

      CREATED ON: JAN 7,2016 by KRING,MICHAEL K

90475.7,.01  NAME                                0;1 FREE TEXT

      INPUT TRANSFORM:  K:$L(X)>30!($L(X)<3) X
      LAST EDITED:     JAN 07, 2016
      HELP-PROMPT:     Answer must be 3-30 characters in length.
      CROSS-REFERENCE: 90475.7^B
                        1)= S ^BLRLSRP("B", $E(X,1,30),DA)=" "
                        2)= K ^BLRLSRP("B", $E(X,1,30),DA)

90475.7,1    LRUER DIVISION                    1;0 POINTER Multiple #90475.71

      DESCRIPTION:     Parameters for the tasked version of the
                        "Changes in verified lab data" Report

90475.71,.01  LRUER DIVISION                    0;1 POINTER TO INSTITUTION FILE (#4)
                        (Required)

      LAST EDITED:     JAN 07, 2016
      HELP-PROMPT:     Enter Division
      CROSS-REFERENCE: 90475.71^B
                        1)= S
                        ^BLRLSRP(DA(1),1,"B", $E(X,1,30),DA)=" "
                        2)= K ^BLRLSRP(DA(1),1,"B", $E(X,1,30),DA)

90475.71,1    Comments [ 'Previously Rep' 0;2 SET

                        '1' FOR YES;
                        '0' FOR NO;
      LAST EDITED:     JAN 07, 2016

90475.71,2    Comments [ 'Specimen Rej' 0;3 SET

                        '1' FOR YES;
                        '0' FOR NO;
      LAST EDITED:     JAN 07, 2016

90475.71,3    Acc With Deleted Comments 0;4 SET

                        '0' FOR NO;
                        '1' FOR YES;
      LAST EDITED:     JAN 07, 2016

90475.71,4    List of Tests                    0;5 SET

                        '0' FOR NO;
                        '1' FOR YES;
      LAST EDITED:     JAN 07, 2016

90475.71,5    New Page Per Accession 0;6 SET

                        '0' FOR NO;
                        '1' FOR YES;
      LAST EDITED:     JAN 07, 2016

```


90475.71,6	Date Range	0;7 SET
		'0' FOR Daily; '1' FOR Weekly; '2' FOR Monthly; '3' FOR Yearly;
	LAST EDITED:	JAN 07, 2016
90475.71,7	DEVICE	0;8 POINTER TO DEVICE FILE (#3.5) (Required)
	LAST EDITED:	JAN 08, 2016
	DESCRIPTION:	Device to which the report will be printed. Must also be specified in the DEVICE FOR QUEUED JOB OUTPUT field when scheduling the task.
90475.7,2	LRSORA DIVISION	2;0 POINTER Multiple #90475.72
90475.72,.01	LRSORA DIVISION	0;1 POINTER TO INSTITUTION FILE (#4) (Required)
	LAST EDITED:	JAN 07, 2016
	DESCRIPTION:	Parameters for the tasked version of the "Search for high/low values of a test" Report.
	CROSS-REFERENCE:	90475.72^B 1)= S ^BLRLSRP(DA(1),2,"B",SE(X,1,30),DA)=" " 2)= K ^BLRLSRP(DA(1),2,"B",SE(X,1,30),DA)
90475.72,1	DATE RANGE	0;2 SET
		'0' FOR Daily; '1' FOR Weekly; '2' FOR Monthly; '3' FOR Yearly;
	LAST EDITED:	JAN 07, 2016
90475.72,2	ACCESSION AREAS	1;0 POINTER Multiple #90475.722
90475.722,.01 (#68)	ACCESSION AREAS	0;1 POINTER TO ACCESSION FILE
	LAST EDITED:	JAN 07, 2016
	CROSS-REFERENCE:	90475.722^B 1)= S ^BLRLSRP(DA(2),2,DA(1),1,"B",SE(X,1,30),D A)=" " 2)= K ^BLRLSRP(DA(2),2,DA(1),1,"B",SE(X,1,30),D A)

```

90475.72,3      LABORATORY TEST      2;0 POINTER Multiple #90475.723

90475.723,.01   LABORATORY TEST      0;1 POINTER TO LABORATORY TEST FILE
(#60
                ) (Required)

                LAST EDITED: JAN 07, 2016
                CROSS-REFERENCE:90475.723^B
                1)= S
^BLRLSRP(DA(2),2,DA(1),2,"B",SE(X,1,30),D
                A)=" "

                2)= K
^BLRLSRP(DA(2),2,DA(1),2,"B",SE(X,1,30),D
                A)

90475.723,1     OPERATOR              0;2 SET (Required)

                '0' FOR GT;
                '1' FOR LT;
                '2' FOR EQ;
                LAST EDITED: JAN 07, 2016

90475.723,2     VALUE                0;3 FREE TEXT (Required)

                INPUT TRANSFORM:K:$L(X)>18!($L(X)<1) X
                LAST EDITED: JAN 07, 2016
                HELP-PROMPT:Answer must be 1-18 characters in length.

90475.72,4     SORT BY                3;1 SET

                'P' FOR PATIENT;
                'L' FOR LOCATION;
                LAST EDITED: JAN 07, 2016

90475.7,3      LRSORC DIVISION      3;0 POINTER Multiple #90475.73

90475.73,.01   LRSORC DIVISION      0;1 POINTER TO INSTITUTION FILE (#4)
                (Required)

                LAST EDITED: JAN 07, 2016
                DESCRIPTION: Parameters for the tasked version of the
                "Search for critical value flagged tests"
                Report.

                CROSS-REFERENCE: 90475.73^B
                1)= S
^BLRLSRP(DA(1),3,"B",SE(X,1,30),DA)=" "
                2)= K ^BLRLSRP(DA(1),3,"B",SE(X,1,30),DA)

90475.73,1     DATE RANGE              0;2 SET

                '0' FOR DAILY;
                '1' FOR WEEKLY;
                '2' FOR MONTHLY;
                '3' FOR YEARLY;
                LAST EDITED: JAN 07, 2016

```

```

90475.73,2      ACCESSION AREAS      1;0 POINTER Multiple #90475.732
90475.732,.01  ACCESSION AREAS      0;1 POINTER TO ACCESSION FILE
(#68)

                LAST EDITED:      JAN 07, 2016
                CROSS-REFERENCE:   90475.732^B
                                1)= S
^BLRLSRP(DA(2),3,DA(1),1,"B",$(X,1,30),D
                                A)=" "

                                2)= K
^BLRLSRP(DA(2),3,DA(1),1,"B",$(X,1,30),D
                                A)

90475.73,3      LOCATION          2;0 POINTER Multiple #90475.733
90475.733,.01  LOCATION          0;1 POINTER TO HOSPITAL LOCATION
FILE (#
                                44)

                LAST EDITED:      JAN 09, 2016
                CROSS-REFERENCE:   90475.733^B
                                1)= S
^BLRLSRP(DA(2),3,DA(1),2,"B",$(X,1,30),D
                                A)=" "

                                2)= K
^BLRLSRP(DA(2),3,DA(1),2,"B",$(X,1,30),D
                                A)

                FILES POINTED TO      FIELDS
ACCESSION (#68)      ACCESSION AREAS:ACCESSION AREAS (#.01)
                    ACCESSION AREAS:ACCESSION AREAS (#.01)
DEVICE (#3.5)        LRUER DIVISION:DEVICE (#7)
HOSPITAL LOCATION (#44)  LOCATION:LOCATION (#.01)
INSTITUTION (#4)      LRUER DIVISION:LRUER DIVISION (#.01)
                    LRSORA DIVISION:LRSORA DIVISION (#.01)
                    LRSORC DIVISION:LRSORC DIVISION (#.01)
LABORATORY TEST (#60)  LABORATORY TEST:LABORATORY TEST (#.01)
VA PATIENT (#2)       PATIENT:PATIENT (#.01)

INPUT TEMPLATE(S):
PRINT TEMPLATE(S):
SORT TEMPLATE(S):
FORM(S)/BLOCK(S):

```

Figure 12-1L IHS Lab Supervisor Tasked Reports Parameter Standard listing

Detailed instructions regarding the use of the new dictionary are included in the *LR*5.2*1038 User's Guide*.

13.0 LR*5.2*1038 KIDS

13.1 Files

The following files were included:

- 61.2 ETIOLOGY FIELD
- 90475.3 IHS UCUM
- 90475.7 IHS LAB SUPERVISOR TASKED REPORTS PARAMETERS

13.2 Options

The following options were included:

- BLR AGE DETAIL Parameter Edit
- BLR CKD-EPI DELTA CHECK CREATE
- BLR CKD-EPI TEST
- IHS LAB BLRSORA TASK
- IHS LAB BLRSORC TASK
- IHS LAB BLRUER TASK

13.3 Parameter Definition

The following Parameter Definition was included:

- BLR AGE DETAIL

13.4 Routines

The following routines were included:

- BLRAGEED BLR AGE DETAIL Parameter Edit
- BLREXEC3 IHS Implementation of the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) eGFR equation
- BLRLINKU IHS LABORATORY VISIT CREATION Utilities
- BLRPOC EHR POC Component support
- BLRPRE38 IHS Lab Patch LR*5.2*1038 Pre/Post Routine
- BLRSORA HIGH/LOW VALUE TASKED REPORT
- BLRSORC CRITICAL VALUE TASKED REPORT

- BLRTASKS IHS LAB TASKS REPORT
- BLRTN CREATE/EDIT TRANSACTIONS
- BLRTNCON IHS Lab to PCC Create/Edit Transactions (Continued)
- BLRUER ERROR TRACKING TASKED REPORT
- LRGV INSTRUMENT GROUP VERIFY DATA
- LROE LAB ORDER ENTRY AND ACCESSION
- LRRP1 PRINT THE DATA FOR INTERIM REPORTS
- LRRP2 INTERIM REPORT
- LRVER3 DATA VERIFICATION
- LRVER4 LAB ROUTINE DATA VERIFICATION
- LRV3 LAB ROUTINE DATA VERIFICATION

Glossary

Daemon

In multitasking computer operating systems, a daemon is a computer program that runs as a background process, rather than being under the direct control of an interactive user.

Global

In MUMPS, global refers to a variable stored on disk (global variable) or the array to which the global variable may belong (global array).

Glomerular Filtration Rate

Glomerular filtration is the process by which the kidneys filter the blood, removing excess wastes and fluids. Glomerular filtration rate (GFR) is a calculation that determines how well the blood is filtered by the kidneys.

MUMPS

Massachusetts General Hospital Utility Multi-Programming System. A procedural, interpreted general-purpose programming language oriented towards database applications.

UNIX

Unix (trademarked as UNIX) is a family of multitasking, multiuser computer operating systems that derive from the original AT&T Unix, developed in the 1970s at the Bell Labs research center.

Acronym List

Acronym	Term Meaning
CKD-EPI	Chronic Kidney Disease Epidemiology Collaboration.
CPT	Current Procedural Terminology
eGFR	Estimated Glomerular Filtration Rate
IHS	Indian Health Service
MDRD	Modification of Diet in Renal Disease
MUMPS	Massachusetts General Hospital Utility Multi-Programming System
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
PCC	Patient Care Component
RPMS	Resource and Patient Management System

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: <https://www.ihs.gov/helpdesk/>

Email: support@ihs.gov