



RESOURCE AND PATIENT MANAGEMENT SYSTEM

Laboratory Reference (LR)

Laboratorian Guide

Version 5.2 Patch 22
November 2007

Office of Information Technology (OIT)
Division of Information Resource Management
Albuquerque, New Mexico

PREFACE

The purpose of this guide is to provide the Lab Managers with documentation that will aid in their use of the enhancements, features, and updates of Lab Patch 22 by presenting the information in a more readable format.

TABLE OF CONTENTS

1.0	Introduction	1
2.0	VA Patch 302: LOINC Update	2
2.1	FileMan Verify.....	2
2.2	Resolving FileMan Verify Fields Warnings Instructions	4
2.2.1	Known Problems	5
2.2.1.1	WKLD Code Invalid Pointer	5
2.2.1.2	Release Date	5
2.2.1.3	Activate WKLD Code	5
2.2.1.4	Topography Field (#61) File	5
2.2.1.5	SNOMED Code.....	6
2.2.1.6	WKLD Code Fails Input Transform	6
2.2.2	Pre-Install Routine.....	6
3.0	LA7 Message Queue Error Messages	8
3.1	ETP Option	8
3.1.1	Error Transactions Found	8
3.1.2	No Error Transactions Found.....	9
4.0	Non-Microbial State Health Department Report	10
5.0	Count Tests Reports	11
6.0	E-SIG Reports	12
6.1	E-SIG RPT Option	12
6.2	E-SIG Reports	12
6.2.1	All E-SIG Transactions Report.....	13
6.2.1.1	Column Definitions	14
6.2.2	Signed Transactions Report.....	14
6.2.2.1	Column Definitions	15
6.2.3	Not Signed by Responsible Physicians Report.....	15
6.2.3.1	Column Definitions	15
6.2.4	Not Reviewed nor Signed Summary Report	16
6.2.4.1	Column Definitions	16
7.0	PCC Visit Creation.....	17
8.0	Address Lines on Interim and Cumulative Reports	18
9.0	New BLR Master Control File Fields.....	19
9.1	INTERIM REPORT LINE 1	19
9.2	INTERIM REPORT LINE 2.....	21
9.3	INTERIM REPORT DO NOT FILE	22
9.4	INTERIM REPORT ADDRESS PAGE.....	23
10.0	Blood Bank Data Dictionary Correction(s).....	24
11.0	V Microbiology RESULT Field.....	26

12.0	EHR Clinical Indication Modifications	27
13.0	ORDERED TEST COST BY PROVIDER Report	28
14.0	Microbiology Print Menu Reports	29
	14.1 Cumulative Patient Report Example	29
15.0	Reference Lab Final Report Filter	31
16.0	IHS eGFR BLREXECU Routine Change.....	32
	16.1 eGFR Example Prior to Modification	32
	16.2 eGFR Example After Modification	33
17.0	VA Patch 289: Delta Check for eGFR Test	34
	17.1 Background	34
	17.2 Reasons for estimated Glomerular Filtration Rate (eGFR)	35
	17.3 The Four-Variable MDRD Study Equation.....	38
	17.4 New Fields.....	39
	17.5 Setting Up INPUT and OUTPUT VALUE.....	42
	17.6 VA Test Sites.....	43
	17.7 Routine Summary.....	43
18.0	VA Patch 287: Process Auto Instrument Duplicate Comments	44
	18.1 VA Test Sites.....	44
	18.2 Routine Summary.....	44
19.0	VA Patch 299: Remove Bad BB Field Reference	45
	19.1 VA Test Sites.....	45
	19.2 Routine Summary:.....	45
20.0	VA Patch 310: Restore Routines Released in VA Patch LR*5.2*301	46
	20.1 Routine Summary.....	47
21.0	VA Patch 307: DSS Lab Results Site/Specimen Expansion	48
	21.1 Routine Description:	48
	21.2 VA Test Sites.....	48
	21.3 Routine Summary.....	48
22.0	VA Patch 305: Not Allowing Lab to Add Patients to the Patient File	49
	22.1 VA Test Sites.....	50
	22.2 Routine Summary.....	51
	22.3 Post Install: Update ALLOW LAB TO ADD PATIENTS Field.....	51
23.0	VA Patch 313: EGFR Delta Check and Automated Instrument Interfaces	52
	23.1 VA Test Sites.....	53
	23.2 Routine Summary.....	54
24.0	VA Patch 312: CPRS Most Recent Results Error.....	55

24.1	Routine Summary.....	56
25.0	VA Lab Patch 340: Correct Display of Unverified Results in CPRS/ORDERS.....	57
25.1	Routine Summary.....	57
26.0	Glossary.....	58
27.0	Contact Information	60

1.0 Introduction

IHS Lab Patch 22 incorporates changes and/or enhancements to the Lab Package that have either corrected issues that had arisen or implemented requests.

This guide provides IHS Lab Managers with descriptions of the changes and/or enhancements and other necessary information in a more readable format.

2.0 VA Patch 302: LOINC Update

IHS Lab Patch 22 includes VA Patch 302, which will update the WKLD CODE (#64) file and replace several laboratory standardized files associated with National Laboratory Test (NLT) package and Logical Observation Identifier Naming Codes (LOINC) coding (see the table below). This patch will remove certain WKLD CODE (#64) file duplicates. This patch will also correct certain field definitions that produce invalid warnings produced by the FileMan Verify Field option.

File #	File Name	Update Method
64.061	LAB ELECTRONIC CODES	Replaced
64.062	LAB ELECTRONIC SUBTYPES	Replaced
64.2	WKLD SUFFIX CODES	Replaced
64.3	WKLD INSTRUMENT MANUFACTURER	Replaced
64.81	LAB NLT/CPT CODES	Replaced
95.3	LAB LOINC	Replaced
95.31	LAB LOINC COMPONENT	Replaced
*64	WKLD CODE	Updated with new terms.

Figure 2-1: LOINC coding table

2.1 FileMan Verify

In order to implement the numerous file/field corrections, it is necessary to completely replace certain referenced NLT and LOINC files. To ensure that this patch does not introduce any new data validation errors, it is desirable that the data currently stored pointing to replaced files is valid and errors resolved.

Failure to ensure FileMan verification of fields option can be run without generating warnings will result in unresolved errors, which could have unpredictable results. The patch installation will not be affected by an invalid field. The patch will generate an error message indicating those files/fields that could not be successfully re-pointed after the standardized have been installed.

The following screenshot shows examples of a single file verify:

```
Select OPTION NAME: VA FileMan

      VA FileMan Version 22.0

Select VA FileMan Option: Utility Functions

Select Utility Functions Option: VERify Fields

MODIFY WHAT FILE: WKLD CODE// 60 LABORATORY TEST (1059 entries)
VERIFY WHICH FIELD: ALL
DO YOU MEAN ALL THE FIELDS IN THE FILE? YES

DEVICE: HOME//
```

Figure 2-2: Sample of a FileMan verify file

While the entire file should pass the verify fields check, the fields listed below are the critical entries that should not produce any warnings. If there are any warnings for these fields, they should be rectified before the patch is installed or the post install re-pointing procedure will not perform properly.

This is a list of files and fields that will be re-pointed after the LAB ELECTRONIC CODES (#64.061) is installed. These fields should be free of verify field warnings. Errors or warnings in other fields *will not* affect the post-install re-pointing process, but should be addressed as soon a possible.

To ensure that there are not any existing pointer problems, files and fields need to be validated. Data and file validation are done with the FileMan Verify Fields option. Only those fields pointing to the replaced files and the WKLD CODE file are an issue.

File #	File Name	Field #	Field Name
60	LABORATORY TEST		
60.01	SITE/SPECIMEN SUB-FIELD	95.3	LOINC CODE
61	TOPOGRAPHY FIELD	0.09	LEDI HL7
61	TOPOGRAPHY FIELD	0.0961	TIME ASPECT
62.05	URGENCY	4	LEDI HL7
62.4	AUTO INSTRUMENT	0.14	WKLD METHOD
62.8	LAB SHIPPING MANIFEST		
62.801	SPECIMENS SUB-FIELD	1.14	PATIENT HEIGHT CODE
62.801	SPECIMENS SUB-FIELD	1.24	PATIENT WEIGHT CODE
62.801	SPECIMENS SUB-FIELD	2.14	COLLECTION VOLUME CODE
62.801	SPECIMENS SUB-FIELD	2.24	COLLECTION DURATION CODE
62.801	SPECIMENS SUB-FIELD	2.34	COLLECTION WEIGHT CODE
62.801	SPECIMENS SUB-FIELD	1.13	PATIENT HEIGHT UNITS
62.801	SPECIMENS SUB-FIELD	1.23	PATIENT WEIGHT UNITS
62.801	SPECIMENS SUB-FIELD	2.13	COLLECTION VOLUME UNITS
62.801	SPECIMENS SUB-FIELD	2.23	COLLECTION DURATION UNITS
62.801	SPECIMENS SUB-FIELD	2.33	COLLECTION WEIGHT UNITS
62.85	LAB SHIPPING EVENT	0.05	EVENT CODE
62.9	LAB SHIPPING CONFIGURATION		
62.9001	TEST/PROFILE	1.15	PATIENT HEIGHT UNITS
62.9001	TEST/PROFILE	1.25	PATIENT WEIGHT UNITS
62.9001	TEST/PROFILE	2.15	COLLECTION VOLUME UNITS
62.9001	TEST/PROFILE	2.25	COLLECTION DURATION UNITS
62.9001	TEST/PROFILE	2.35	COLLECTION WEIGHT UNITS
62.9001	TEST/PROFILE	1.16	PATIENT HEIGHT CODE

File #	File Name	Field #	Field Name
62.9001	TEST/PROFILE	1.26	PATIENT WEIGHT CODE
62.9001	TEST/PROFILE	2.16	COLLECTION VOLUME CODE
62.9001	TEST/PROFILE	2.26	COLLECTION DURATION CODE
62.9001	TEST/PROFILE	2.36	COLLECTION WEIGHT CODE
64.2	WKLD SUFFIX CODE		
64.2	WKLD SUFFIX CODE	1	WKLD SUFFIX CODE
64.2	WKLD SUFFIX CODE	4	BILLABLE PROCEDURE
64.2	WKLD SUFFIX CODE	7	COST
64.2	WKLD SUFFIX CODE	8	PRICE
64.2	WKLD SUFFIX CODE	9	SORTING GROUP
64.2	WKLD SUFFIX CODE	15	ACTIVATE WKLD CODE
64	WKLD CODE		
64.02	TIME ASPECT SUB-FIELD	0.01	TIME ASPECT
64.02	TIME ASPECT SUB-FIELD	1	UNITS
68.2	LOAD/WORK LIST	0.14	WKLD METHOD
69.6	LAB PENDING ORDERS ENTRY	6	SPECIMEN STATUS
69.64	ORDERED TESTS SUB- FIELD	5	TEST STATUS

Figure 2-3: Files/fields that will be re-pointed after LAB ELECTRONIC CODES install

2.2 Resolving FileMan Verify Fields Warnings Instructions

The most common verify field errors are as listed below:

1. Fields not properly cross-referenced. Resolve this by re-indexing the file.
2. Fields failing input transform. Resolve this by either editing the field and entering appropriate data, or deleting the existing data in the field.

Note: When performing FileMan Verify Fields, an error will be produced in the TOPOGRAPHY FIELD((#61) file, SNOMED CODE (#2) field by the input transform logic error.

```
Example:
ENTRY#      NAME                ERROR
1           RIGHT LUNG          "28100" fails Input
Transform
ALREADY AN ENTRY

This input transform logic error will be corrected with the
installation of this patch.
** NO PRE-INSTALL CORRECTIVE ACTION IS REQUIRED. **
```

Figure 2-4: Sample of an error screen

2.2.1 Known Problems

When the `Verify Field` option is run on the various files, several different kinds of warnings can be generated. It is not possible to describe a resolution method for the type of warning discovered using the `FileMan Verify Field` option, but here are some techniques used during testing.

2.2.1.1 WKLD Code Invalid Pointer

This broken pointer will be correct with the install. No action required.

```

WKLD CODE (#64)
=====
--UNIT FOR COUNT--    POINTER

ENTRY#    PROCEDURE                ERROR
1504      Shell Vial Technique        No '68' in pointed-to File
  
```

Figure 2-5: Sample of a WKLD code invalid pointer screen

2.2.1.2 Release Date

Enter a release date to correct this problem, as shown in the following example.

```

=====
--RELEASE DATE--    DATE

1749      Misc Chem Test 5
1          86023;ICPT(                Missing

1753      Misc Chem Test 9
1          80100;ICPT(                Missing
  
```

Figure 2-6: Sample of the screen requesting entry of a release date

2.2.1.3 Activate WKLD Code

Re-indexing the file will correct this problem.

```

SET OF CODES
(CHECKING CROSS-REFERENCE)

ENTRY#    PROCEDURE                ERROR
100074    Lactic Acid~ACA IV            "1" not properly Cross-
referenced
  
```

Figure 2-7: Sample of the screen used to re-index the file

2.2.1.4 Topography Field (#61) File

The user should either delete the entry (if not using this specimen), or enter the correct data.

```

=====
LEDI HL7 (#.09) field

    POINTER
(CANNOT CHECK CROSS-REFERENCE)

ENTRY#    NAME                                ERROR
22        KIDNEY                              "1275" fails Input
Transform
82        CILIARY GLAND                       "6417" fails Input
Transform

```

Figure 2-8: Sample of the topography field file screen

2.2.1.5 SNOMED Code

Enter missing data. If input transform failure is reported this will be corrected when the patch is installed. Notice the following example:

```

=====
VERIFY WHICH FIELD: SNOMED CODE

    FREE TEXT
(CHECKING CROSS-REFERENCE)

ENTRY#    NAME                                ERROR
8729     TISSUE                              Missing
8730     ORGANISM                            Missing

```

Figure 2-9: Sample of SNOMED code screen

2.2.1.6 WKLD Code Fails Input Transform

There is also a FileMan Verify Field error “fails Input Transform” in WKLD CODE (#64) file that will be corrected with the install of LR*5.2*302. The screen preventing the selection of LOINC codes with Del (delete) status will be removed. This will allow LEDI sites to coordinate transition from deprecated terms to active terms.

The “DEL” screen will be removed from the following two fields:

```

DEFAULT LOINC CODE (#25) field.
SPECIMEN (#20), sub-file TIME ASPECT (#30), LOINC CODE (#4) field.

```

Figure 2-10: Sample of FM Verify error

No pre-installation corrective action is required for these errors.

2.2.2 Pre-Install Routine

The pre-install routine will produce a listing of duplicate(s) contained in WKLD CODE (#64) file if any are present.

Those duplicates listed with a proceeding “*” *should* be resolved before installation of the patch. However, the patch will install even if the duplicates are present during installation.

Those duplicates listed with a proceeding “+” will be deleted by the pre-install program. No action is required.

Those duplicates that do not have a preceding character will not affect the installation. Those entries that do not have a preceding character are locally created NLT codes and are provided to indicate to the local user that multiples do exist. This information may be useful when doing searches on the WKLD DATA (#64.1) file for a particular test(s).

See the following example of a listing:

```
Checking WKLD CODE file (#64) for duplicate names or numbers.

+Blood Products Administration^2633
+Blood Products Administration^3214

+CPK MB/CPK Tot^3702
+CPK MB/CPK Tot^3767

+Coagulation Factor VIII Inhib~BLOOD CENTER OF SE WISCONSIN^100873
Coagulation Factor VIII Inhib~BLOOD CENTER OF SE WISCONSIN^100874

*CPK MB/CPT Tot~BLOOD CENTER OF SE WISCONSIN^100973
*CPK MB/CPT Tot~BLOOD CENTER OF SE WISCONSIN^100974

+Hypersensitivity Pneumonitis^1557
+Hypersensitivity Pneumonitis^1600

+89026.0000 ^1600
+89026.0000 ^2828

                                End of duplicate listing.

If '*' duplicates were listed they should be resolved before patch
install.

Those '+' will be removed during the post install.
```

Figure 2-11: Sample duplicate listing

3.0 LA7 Message Queue Error Messages

This new option on the BLR IHS Lab Main Support Menu will allow users with the LRSUPER security key to change the status of messages that are over 30 days old in the LA7 MESSAGE QUEUE (File # 62.49) from a status of ERROR to a status of PURGEABLE, allowing the messages to be deleted from the queue by the HL7 nightly "garbage collector" routine, thus freeing up disk space.

It has been created because ERROR messages are *never* purged.

3.1 ETP Option

The option to purge the LA7 error message is accessed from the BLR MENU. Please note the following example. Bold text indicated user action.

```
Select Laboratory DHCP Menu Option: BLR IHS Lab Main Support Menu

LS      Link Transaction Processor Status
7421    Will restart the 7421 label routine if turned off.
INQ     Inquire into the IHS LAB Transaction Log
FLD     Search Transactions for PCC LINK DISABLE Error
RSN     Requeue by Sequence Number
RST     Requeue Transaction by Sort Template
CPT     Enter/edit IHS Lab CPT File
FAL     Find ALL PCC Link Errors from Lab
STP     Stop/restart Lab to PCC Transaction Processor
MSTR    Enter/edit BLR MASTER CONTROL FILE
POV     Purpose of Visit Compliance Report
CLR     Clear BLR errors from error log
CUM     IHS CUMULATIVE MENU ...
EDT     Edit Provider/Ordering Location ...
ETP   LA7 Message Queue Error Messages to Purgeable
REFL    Reference Lab Main Menu ...
SHDR    State Health Dept Report

Select IHS Lab Main Support Menu Option:
```

Figure 3-1: Sample of BLR menu screen

3.1.1 Error Transactions Found

If error transactions are found, a dot will be printed for each one. Then the total number of transactions changed from error to purgeable will be listed.

```
IHS/OIT LabDev Test Database
Date:08/28/06          LA7 MESSAGE QUEUE (#62.49)          Time:1:37 PM
                      MODIFY ERROR MESSAGE to PURGEABLE MESSAGE
-----
Making LA7 MESSAGE QUEUE ERROR MESSAGES Purgeable
.....
.....
.....
.....

Number of "Errors" in 62.49 Changed to Purgeable:208

Enter RETURN to Continue:
```

Figure 3-2: Sample of error transactions screen

3.1.2 No Error Transactions Found

If no error messages are found in the 64.49 queue, the following screen is displayed.

```
IHS/OIT LabDev Test Database
Date:08/28/06          LA7 MESSAGE QUEUE (#62.49)          Time:1:30 PM
                      MODIFY ERROR MESSAGE to PURGEABLE MESSAGE
-----
Making LA7 MESSAGE QUEUE ERROR MESSAGES Purgeable

No "Errors" found in 62.49

Enter RETURN to Continue:
```

Figure 3-3: Sample of screen when no error transactions are found

4.0 Non-Microbial State Health Department Report

The Non-Microbial State Health Department report's BLRSHDRC routine had a potential issue with patients with no address filled out in the VA Patient file. A check has been added that will return a *null* string if there is no address in the VA Patient file. This will mean the patient with no address will have none printed on the report.

5.0 Count Tests Reports

The LR COUNT ACC TESTS, Lab accession, and test counts reports could display inconsistent totals due to counting certain accessions twice.

This would occur when an accession was entered on one day and completed on another. The counting twice issue has been resolved by keeping track of the accessions. Both the LRUPAC and LRUPACA routines have been modified.

6.0 E-SIG Reports

The Electronic Signature module of Lab does not have easily accessible, E-SIG specific reports. A series of routines have been developed to create four reports that will give certain basic information regarding the Providers assigned to E-SIG.

Note: If the site does not have the BLRA Lab E-SIG Menu entry in the OPTION file (# 19), then the routines will not be added to any menu. The site will have to manually add the BLRA LAB ES REPORTS option to the menu of their choice.

If the site is *not* using E-SIG, these reports are superfluous.

6.1 E-SIG RPT Option

The E-SIG reports are accessed through a new option off the main E-SIG menu:

```

Lab E-SIG Menu

DEL    Delinquent Lab Results **NEW**
EDT    Enter/Edit/Re-activate Lab ESIG Physicians **NEW**
INAC   Inactivate Lab ESIG Physicians **NEW**
REV    Review/Sign Lab Results **NEW**
RPT   Lab E-SIG Reports
SGN    Signed Lab Results Report **NEW**
        Print Lab Audit Report

Select Lab E-SIG Menu Option:

```

Figure 6-1: Sample of menu screen where E-SIG reports are accessed

6.2 E-SIG Reports

Selecting the RPT option (as shown in Figure 6-1 above) will display a reports menu like the one shown in the following example:

```

                                IHS/OIT LabDev Test Database
Date:08/24/06                    LAB E-SIG Reports                    Time:9:25 AM
-----
1    All E-SIG Transactions
2    Signed Transactions
3    Not Signed by Responsible Physician
4    Not Reviewed nor Signed Summary

Select: (1-4):

```

Figure 6-2: Sample of reports menu

6.2.1 All E-SIG Transactions Report

The selection of All E-Sig Transactions will cause the following prompt to display:

```
Output ALL E-SIG transactions for ALL Providers? YES//
```

If the default of 'Yes' is selected, then all providers in the BLRA LAB PHYSICIANS dictionary (9009027.1) will have all of their transactions displayed.

If 'No' is entered, then the system will ask for providers to include in the report by displaying the following prompt:

```
Select BLRA LAB PHYSICIANS PARTICIPATING PHYSICIAN:
```

Note that only providers that are in the BLRA LAB PHYSICIANS dictionary (9009027.1) can be selected.

The next prompt after the selection of the provider(s) will be for a date range:

```
Start with Date: TODAY//
```

Then the following prompt will display:

```
Go back to Date TODAY//
```

Once the date range has been entered, the report will display something similar to the following:

```

IHS/OIT LabDev Test Database
Date:08/28/06          ALL LAB E-SIG ACCESSIONS          Page 1
Time:2:07 PM         SORTED BY RESPONSIBLE PHYSICIAN
                      DATE RANGE: 09/06/05 THRU 08/28/06

```

RESP PHYSICIAN	ACC #	COLL DATE/TIME	STATUS	SIGN PHYSICIAN
BUNNY,BUGS	CH 0808 10	08/08/06@06:45	NOT REVIEWED	
BUNNY,BUGS	CH 0808 9	08/08/06@06:45	NOT REVIEWED	
BUNNY,BUGS	MI 06 5	06/23/06@10:16	NOT REVIEWED	
BUNNY,BUGS	CH 0810 9	08/10/06@09:35	NOT REVIEWED	
BUNNY,BUGS	CH 1208 3	12/08/05@13:12	NOT REVIEWED	
BUNNY,BUGS	CH 0414 2	04/14/06@13:53	REV & SIGNED	FUDD,ELMER
COYOTE,WILE E	HE 1115 1	11/15/05@11:21	NOT REVIEWED	
FUDD,ELMER	CH 0720 8	07/20/06@13:49	NOT REVIEWED	
FUDD,ELMER	CH 0710 8	07/10/06@14:06	NOT REVIEWED	
FUDD,ELMER	CH 0623 6	06/23/06@07:09	NOT REVIEWED	
FUDD,ELMER	CH 0620 6	06/20/06@06:58	NOT REVIEWED	

Enter RETURN to continue or '^' to exit:

Figure 6-3: Sample of a transactions report

6.2.1.1 Column Definitions

The following table describes column definitions:

Column	Definition
RESP PHYSICIAN	The responsible physician assigned to the test(s).
ACC #	Accession Number.
COLL DATE/TIME	The Collection Date and Time.
STATUS	The Status of the E-SIG transaction: <ul style="list-style-type: none"> • Not Reviewed • Reviewed • Reviewed and Signed
SIGN PHYSICIAN	The physician who signed off on the E-SIG transaction. Note that it does not have to be the responsible physician – it can be a surrogate.

Figure 6-4: Table of column definitions

6.2.2 Signed Transactions Report

This report will display only those transactions that have been signed. As with the ALL report selection, the routines will prompt for provider(s) and a date range. Once selected, the report will be similar to the following example:

```

IHS/OIT LabDev Test Database
Date:08/28/06          SIGNED LAB E-SIG ACCESSIONS          Page 1
Time:2:20 PM          SORTED BY RESPONSIBLE PHYSICIAN
                      DATE RANGE: 08/28/05 THRU 08/28/06
                      RESPONSIBLE PHYSICIAN: BUNNY,BUGS

ACC #          COLL DATE/TIME  SIGN DATE/TIME  SIGNING PHY
-----
CH 0414 2          04/14/06@13:53  04/14/06@13:53  FUDD,ELMER

          Number of Signed E-SIG transactions for BUNNY,BUGS = 1

Enter RETURN to continue or '^' to exit:

```

Figure 6-5: Sample of signed transactions report

Each *Responsible Physician* will begin a new page in the report.

6.2.2.1 Column Definitions

The following table describes column definitions:

Column	Definition
ACC #	Accession Number
COLL DATE/TIME	The Collection Date and Time
SIGN DATE/TIME	The Date/Time the E-Sig transaction was signed
SIGNING PHY	The physician who signed off on the E-SIG transaction. Note that it does not have to be the responsible physician – it can be a surrogate

Figure 6-6: Table of column definitions

6.2.3 Not Signed by Responsible Physicians Report

This report will display only those transactions that have been signed by someone *other than* the Responsible Physician. As with the ALL report selection, the routines will prompt for provider(s) and a date range. Once selected, the report will be similar to the following example:

IHS/OIT LabDev Test Database			
Date:08/28/06	REVIEWED & NOT SIGNED BY RESP PHYSICIAN		Page 1
Time:2:26 PM	SORTED BY RESPONSIBLE PHYSICIAN		
	DATE RANGE: 08/28/05 THRU 08/28/06		
	RESPONSIBLE PHYSICIAN: BUNNY,BUGS		
ACC #	COLL DATE/TIME	SIGN DATE/TIME	SIGNING PHY

CH 0414 2	04/14/06@13:53	04/14/06@13:53	FUDD, ELMER
Number of records = 1			
Press RETURN Key:			

Figure 6-7: Sample of report of transactions signed by someone other than the responsible physician

6.2.3.1 Column Definitions

The following table describes column definitions:

Column	Definition
ACC #	Accession Number
COLL DATE/TIME	The Collection Date and Time
SIGN DATE/TIME	The Date/Time the E-Sig transaction was signed
SIGNING PHY	The physician who signed off on the E-SIG transaction. Note that it does not have to be the responsible physician – it can be a surrogate.

Figure 6-8: Table of column definitions

6.2.4 Not Reviewed nor Signed Summary Report

This is a cumulative report and, as such, it does not prompt for providers or a date range. It lists all the transactions that have been neither reviewed nor signed. It will look similar to the following:

IHS/OIT LabDev Test Database			
Date:08/28/06	LAB E-SIG NOT SIGNED SUMMARY REPORT		Page 1
Time:2:28 PM	SORTED BY RESPONSIBLE PHYSICIAN		
Physician Name	Not View Count	Not Sign Count	Total
COYOTE, WILE E	5	0	5
BUNNY, BUGS	8	1	9
FUDD, ELMER	78	1	79
TOTAL	91	2	93

Press RETURN Key:

Figure 6-9: Sample of a summary report

6.2.4.1 Column Definitions

The following table describes column definitions:

Column	Definition
Physician Name	The name of the Physician from the BLRA LAB PHYSICIANS (9009027.1) dictionary
Not View Count	The number of E-SIG transactions that have not been reviewed
Not Sign Count	The number of E-SIG transactions that have not been signed
Total	The total of non-reviewed and not signed E-SIG transactions

Figure 6-10: Table of column definitions

7.0 PCC Visit Creation

The PCC Visit creation routine BLRLINK2 has been modified to use the SAC standard API calls instead of obsolete routines. A new routine, BLRPCCVC, has also been created to aid in the PCC visit creation process.

This does not affect the users of the Lab system in any way.

Note: The PCC Visit that is created will have the CLINIC field filled in based upon the STOP CODE NUMBER entry of the HOSPITAL LOCATION selected during the accessioning process.

Example of an entry in the HOSPITAL LOCATION dictionary:

```

NAME: LABORATORY                ABBREVIATION: LAB
TYPE: CLINIC                    INSTITUTION: EHR DEMO
STOP CODE NUMBER: LABORATORY SERVICES
DIVISION: DEMO                  NON-COUNT CLINIC? (Y OR N): NO
CLINIC MEETS AT THIS FACILITY?: YES  TYPE EXTENSION: CLINIC
ALLOWABLE CONSECUTIVE NO-SHOWS: 2    MAX # DAYS FOR FUTURE
BOOKING: 10
MAX # DAYS FOR AUTO-REBOOK: 10
LENGTH OF APP'T: 10              HOUR CLINIC DISPLAY BEGINS: 8
DISPLAY INCREMENTS PER HOUR: 10-MIN  OVERBOOKS/DAY MAXIMUM: 10

```

Figure 7-1: Sample hospital location dictionary entry

In this example, the STOP CODE NUMBER is LABORATORY SERVICES. If a visit is created using the Laboratory as the PATIENT LOCATION when entering the Lab test, then that is the CLINIC code that will be stored in the PCC Visit.

The following is an example of a SODIUM laboratory test created with LOCATION of LABORATORY and the CLINIC CODE of LABORATORY SERVICES was stored.

```

LAB TEST:                SODIUM
RESULTS:                 15
ABNORMAL:                L*
LR ACCESSION NO.:       CH 0417 5
UNITS:                   mmol/L
ORDER:                   137
SITE:                    SERUM
REFERENCE LOW:           137
REFERENCE HIGH:          145
SOURCE OF DATA INPUT:  LAB
CURRENT STATUS FLAG:    RESULTED
COLLECTION SAMPLE:      BLOOD
COLLECTION DATE AND T:  APR 17, 2007@12:55
ORDERING PROVIDER:      USER,DEMO
CLINIC:                  LABORATORY SERVICES
ORDERING DATE:           APR 17, 2007@12:55
RESULT DATE AND TIME:    APR 17, 2007@12:55:51
CPT PTR:                 SODIUM
CPT - BILLABLE ITEMS:   84295|||||
LAB POV:                 TEST

```

Figure 7-2: Sample of SODIUM laboratory test

8.0 Address Lines on Interim and Cumulative Reports

This patch modifies LRRP1, LRRP2, and LRMIPSU to ensure that the address of the site performing the test(s) is printed on the report.

9.0 New BLR Master Control File Fields

This patch adds 4 new fields to the BLR MASTER CONTROL file:

9.1 INTERIM REPORT LINE 1

The INTERIM REPORT LINE 1 field is a free text field.

If the INTERIM REPORT LINE 1 field is filled out, then the Interim Report routine LRRP1 will use that entry as the first line of information to print after the CLINICAL LABORATORY REPORT line. This will replace the information that is normally retrieved from the Institution file.

For example, an Interim Report for a test patient looks like:

```

                                CLINICAL LABORATORY REPORT
Printed at:                                page 1
DESKTOP TEST (516) 1313 MOCKINGBIRD HEIGHTS NE ALBUQUERQUE, NM 87110

PATIENT,FEMALE                               Report date: 11/28/2006 7:28 am
      HRCN: 110453      SEX: F      AGE: 33      LOC: IMA

      Provider: PROVIDER,TEST
      REVIEW STATUS: Not Reviewed
      Specimen: BLOOD
Accession [UID]: CH 1127 3 [1063310003]

                                Specimen Collection Date: 11/27/06 13:05
Test name          Result  units  Ref.  range  Site Code
HEMOGLOBIN A1C    6      %      3.5 - 6      [516]
Eval: AS OF 6-6-83(PRIOR RANGE: 5-9)
=====
KEY: "L"=Abnormal low, "H"=Abnormal high, "*"=Critical value

PATIENT,FEMALE                               110453  11/28/06      PRESS '^' TO STOP

```

Figure 9-1: Default interim report

The address printed above is from the Institution File (# 4) fields STREET ADDR. 1, CITY, STATE, and ZIP. That is the default information that is printed on the report.

If data are entered into the new INTERIM REPORT LINE 1 field, that is what will print. For example, if the following is entered into that field,

```
Just An Example 4125 ANYWHERE STREET TAOS, NM
```

then the report will look like the following:

```

                                CLINICAL LABORATORY REPORT
Printed at:                                page 1
                Just An Example 4125 ANYWHERE STREET TAOS, NM
PATIENT,FEMALE                                Report date: 11/28/2006 8:13 am
    HRCN: 110453    SEX: F    AGE: 33    LOC: IMA
    Provider: PROVIDER,TEST
    REVIEW STATUS: Not Reviewed
    Specimen: BLOOD
Accession [UID]: CH 1127 3 [1063310003]

                                Specimen Collection Date: 11/27/06 13:05
Test name                                Result    units    Ref.    range    Site Code
HEMOGLOBIN A1C                            6        %        3.5    -    6        [516]
    Eval: AS OF 6-6-83(PRIOR RANGE: 5-9)
=====
    KEY: "L"=Abnormal low, "H"=Abnormal high, "*"=Critical value

PATIENT,FEMALE                                110453  11/28/06                                PRESS '^' TO STOP

```

Figure 9-2: Interim report with INTERIM LINE 1 filled in

9.2 INTERIM REPORT LINE 2

The INTERIM REPORT LINE 2 field is a free text field.

If the INTERIM REPORT LINE 2 field is filled out, then the LRRP1 routine will use the entry as the second line of the header.

For example, if the following is entered into the field,

```
ANOTHER LINE TO ILLUSTRATE THE EFFECT
```

then the report will look like the following:

```

                                CLINICAL LABORATORY REPORT
Printed at:                                page 1
                Just An Example  4125 ANYWHERE STREET  TAOS, NM
                ANOTHER LINE TO ILLUSTRATE THE EFFECT

PATIENT, FEMALE                                Report date: 11/28/2006 8:17 am
  HRCN: 110453    SEX: F    AGE: 33    LOC: IMA

  Provider: PROVIDER, TEST
  REVIEW STATUS: Not Reviewed
  Specimen: BLOOD
Accession [UID]: CH 1127 3 [1063310003]

                                Specimen Collection Date: 11/27/06 13:05
Test name          Result  units    Ref.  range  Site Code
HEMOGLOBIN A1C    6      %      3.5 - 6    [516]
  Eval: AS OF 6-6-83(PRIOR RANGE: 5-9)
=====
KEY: "L"=Abnormal low, "H"=Abnormal high, "*"=Critical value

PATIENT, FEMALE                                110453  11/28/06                                PRESS '^' TO STOP

```

Figure 9-3: Interim report with INTERIM REPORT LINE 2 field filled in

9.3 INTERIM REPORT DO NOT FILE

The default printed output of the Interim Report is to print the message DO NOT FILE at the bottom of the page. For example:

```

                                CLINICAL LABORATORY REPORT
Printed at:                                page 1
                Just An Example  4125 ANYWHERE STREET  TAOS, NM
                ANOTHER LINE TO ILLUSTRATE THE EFFECT

PATIENT,FEMALE                                Report date: 11/28/2006 8:17 am
  HRCN: 110453    SEX: F    AGE: 33    LOC: IMA

  Provider: PROVIDER,TEST
  REVIEW STATUS: Not Reviewed
  Specimen: BLOOD
Accession [UID]: CH 1127 3 [1063310003]

                                Specimen Collection Date: 11/27/06 13:05
Test name          Result    units    Ref.    range    Site Code
HEMOGLOBIN A1C          6      %      3.5 -    6      [516]
  Eval: AS OF 6-6-83(PRIOR RANGE: 5-9)
=====
  KEY: "L"=Abnormal low, "H"=Abnormal high, "*"=Critical value

WORK COPY - DO NOT FILE  PATIENT,FEMALE    110453    11/28/06

```

Figure 9-4: Interim report DO NOT COPY example

Some sites do not want that message because they do file the Interim Reports. A new field has been created – the INTERIM REPORT DO NOT FILE field – and it is a Yes/No field.

If the INTERIM REPORT DO NOT FILE field is set to 'No,' the WORK COPY - DO NOT FILE message *will not* be printed at the bottom of the page of the Interim Report. For example:

```

                                CLINICAL LABORATORY REPORT
Printed at:                                page 1
                Just An Example  4125 ANYWHERE STREET  TAOS, NM
                ANOTHER LINE TO ILLUSTRATE THE EFFECT

PATIENT,FEMALE                                Report date: 11/28/2006 8:17 am
HRCN: 110453    SEX: F    AGE: 33    LOC: IMA

Provider: PROVIDER,TEST
REVIEW STATUS: Not Reviewed
Specimen: BLOOD
Accession [UID]: CH 1127 3 [1063310003]

                                Specimen Collection Date: 11/27/06 13:05
Test name          Result    units    Ref.    range    Site Code
HEMOGLOBIN A1C    6        %        3.5 -    6        [516]
Eval: AS OF 6-6-83(PRIOR RANGE: 5-9)
=====
KEY: "L"=Abnormal low, "H"=Abnormal high, "*"=Critical value

                                PATIENT,FEMALE    110453    11/28/06

```

Figure 9-5: Interim report example without DO NOT COPY

If it is blank or set to 'Yes,' then the WORK COPY - DO NOT FILE message *will* be printed.

9.4 INTERIM REPORT ADDRESS PAGE

The Interim Report default is to print an address page after each patient. For example:

```

                                page 4
PATIENT,FEMALE                                110453    11/28/2006 9:11 am

PERFORMING LAB SITES

[516] DESKTOP TEST    1313 MOCKINGBIRD HEIGHTS NE    ALBUQUERQUE, NM 87110

```

Figure 9-6: Interim report address page

If the new field INTERIM REPORT ADDRESS PAGE is set to 'No,' then the page will not print.

If it does find any anomaly, it will produce a screen similar to the following:

```

                                EHR DEMO
Date:09/20/06          BLOOD BANK DATA DICTIONARY INPUT TRANSFORM          Time:12:30 PM
                      MODIFY $$$SITE^VASITE to $P($$SITE^VASITE,U,3)
-----
1  D0:65      D1:.16      D2:0
   DIVISION^R*P4'^DIC(4,^0;16^S DIC("S")="I +$G(^DIC(4,+Y,99))=+$$$SITE^VASIT
   DIVISION^R*P4'^DIC(4,^0;16^S DIC("S")="I +$G(^DIC(4,+Y,99))=+$P($$SITE^VA

2  D0:65      D1:.16      D2:12.1
   S DIC("S")="I +$G(^DIC(4,+Y,99))=+$$$SITE^VASITE"
   S DIC("S")="I +$G(^DIC(4,+Y,99))=+$P($$SITE^VASITE,U,3)"

3  D0:66.1    D1:.01      D2:0
   ASSOCIATED DIVISION^M*P4'X^DIC(4,^0;1^S DIC("S")="B I +$G(^DIC(4,+Y,99))
   ASSOCIATED DIVISION^M*P4'X^DIC(4,^0;1^S DIC("S")="B I +$G(^DIC(4,+Y,99))

4  D0:66.1    D1:.01      D2:12.1
   S DIC("S")="I +$G(^DIC(4,+Y,99))=+$$$SITE^VASITE"
   S DIC("S")="I +$G(^DIC(4,+Y,99))=+$P($$SITE^VASITE,U,3)"

5  D0:69.981  D1:.01      D2:0
   BLOOD BANK DIVISION^M*P4'X^DIC(4,^0;1^S DIC("S")="I +$G(^DIC(4,+Y,99))=+$
   BLOOD BANK DIVISION^M*P4'X^DIC(4,^0;1^S DIC("S")="I +$G(^DIC(4,+Y,99))=+$

6  D0:69.981  D1:.01      D2:12.1
   S DIC("S")="I +$G(^DIC(4,+Y,99))=+$$$SITE^VASITE"
   S DIC("S")="I +$G(^DIC(4,+Y,99))=+$P($$SITE^VASITE,U,3)"

Done.

```

Figure 10-2: BLRBBDDC output

This should only be run by the Site Manager.

11.0 V Microbiology RESULT Field Data Dictionary Modification

During the post install of the IHS Lab Patch 22, the RESULT field in the V MICROBIOLOGY file will be modified to be able to handle a string of up to 80 characters long.

Permission for this change has been granted to the Lab Developer by the PCC Developer.

This has been done in order to facilitate more meaningful RESULT data being passed to PCC.

There will be messages printed during the post-install process. They should look like the following:

```
Changing RESULT field max string length & HELP in V MICRO file to 80.
  Changed RESULT field max string length in V MICRO file. OK.
  Changed RESULT field HELP in V MICRO file. OK.
  Changed RESULT field max string length & HELP in V MICRO file. OK.
```

Figure 11-1: Sample of a post-install message

If any problems arise, a NON-FATAL error message will print. If, for example, the routine could not modify the HELP message entry, the message would resemble the following:

```
Changing RESULT field max string length & HELP in V MICRO file to 80.
  Changed RESULT field max string length in V MICRO file. OK.
*****
                                Site: UNKNOWN
                                *** WARNING *** WARNING *** WARNING ***
>>> Could not change RESULT field HELP in V MICRO file <<<
                                *** WARNING *** WARNING *** WARNING ***
*****
```

Figure 11-2: Sample of a non-fatal error message

Any error message is informational only and does not impact the installation of the other components of IHS Lab Patch 22.

12.0 EHR Clinical Indication Modifications to Lab Routines

Two Lab routines, LR70F1 and LR70F3, have been modified so that clinical indications can be set (if they exist) in the Lab Package so they can be displayed in EHR.

This does not affect lab functionality and will only be noticed in the EHR screens.

13.0 ORDERED TEST COST BY PROVIDER Report

The ORDERED TEST COST BY PROVIDER report would have an <UNDEFINED> error if the patient information was requested and the patient did not have a Social Security number.

The LRTOCOST routine has been modified so that if the patient detail is requested and the patient does not have a SSN, then the report will display 999-99-9999 as the SSN.

There was also an issue that when the user selected DETAILED PATIENT information to print, the report would not list the detailed information due to an inadvertent bug. It has been corrected.

14.0 Microbiology Print Menu Reports

The LRMIPSU routine has been modified to print the Name and Address from the new INTERIM REPORT address fields in the BLR MASTER CONTROL file if they exist; if not, then it will use the address fields in the Institution file, if they exist, on the patient Microbiology reports. The Institution is based upon the user's entry in the NEW PERSON File (# 200):

- If the user has a DEFAULT DIVISION, that is the institution address that will print.
- If the user does not have a DEFAULT DIVISION, the system will use the KERNEL SYSTEMS PARAMETERS file's DEFAULT INSTITUTION entry.

The routine will use the INSTITUTION file's entries STREET ADDR. 1, STREET ADDR. 2, CITY, STATE, and ZIP CODE.

If and only if the STREET ADDR. 1 entry is blank, the routine will then attempt to use the entries STREET ADDR. 1 (MAILING), STREET ADDR. 2 (MAILING), CITY (MAILING), STATE (MAILING) and ZIP CODE (MAILING), if they exist.

If and only if there are no address entries in either of the above entries, the routine will print just the Institution name.

14.1 Cumulative Patient Report Example

For this example, there are no INTERIM REPORT address entries in the BLR MASTER CONTROL file. The Institution file for this example looks like (using FileMan Inquiry mode):

NAME: IHS/OIT LabDev Test Database	STATE: NEW MEXICO
STREET ADDR. 1: 111 NOWHERE NE	STREET ADDR. 2: SUITE 201
CITY: ALBUQUERUQE	ZIP: 87110
CONTACT: JOE DOE, CHIEF PATHOLOGIST	PHONE #: 555-5555
ST. ADDR. 1 (MAILING): 123 ANYWHERE NE	
CITY (MAILING): ALBUQUERQUE	STATE (MAILING): NEW MEXICO
ZIP (MAILING): 87110	STATION NUMBER: 202812
AGENCY CODE: IHS	POINTER TO AGENCY: IHS
CODING SYSTEM: VASTANUM	ID: 202812

Figure 14-1: Example institution file entries

If the Cumulative patient report is run from the MICROBIOLOGY PRINT MENU, the report could look like the following:

```
PATIENT, DEMO    101684    AGE: 85    01/25/07 10:06
                -----MICROBIOLOGY-----
                IHS/OIT LabDev Test Database
                111 NOWHERE NE SUITE 201 ALBUQUERUQE, NM 87110
                page 1

Accession: MI 06 1    Received: Feb 14, 2006 12:51
Collection sample: URINE, STERILE    Collection date: Feb 14,
2006 12:51
Site/Specimen: URINE
Provider: PROVIDER, DEMO
Comment on specimen: NEGATIVE

Test(s) ordered: URINE CULTURE    completed: Feb 16, 2006

PATIENT, DEMO    101684    ROUTING: ER    PRESS '^' TO STOP
```

Figure 14-2: Microbiology cumulative patient report example

Note that the printed address is from the STREET ADDR.1, etc. entries and not the STREET ADDR. 1 (MAILING), etc. entries of the INSTITUTION file.

15.0 Reference Lab Final Report Filter

Three Reference Lab routines, BLRRIIN, BLRRIIN1, and BLRRIIN2 have been modified so that only Final Reports will be filtered.

This change is transparent to the user and only affects sites that are using the Reference Lab interface.

16.0 IHS eGFR BLREXECU Routine Change

This patch modifies the BLREXECU routine, which is the original IHS program that calculates the estimated Glomerular Filtration Rate (eGFR) for a CREATININE test. The National Kidney Disease Education Program (NKDEP) has strongly recommended that any eGFR that is greater than 60 be reported as >60 and not as a number (i.e., 70). The routine has been modified to return the string >60 instead of any number higher than 60.

The following is from the NKDEP's web site:

The NKDEP recommends reporting eGFR values *above 60 mL/min/1.73 m²* simply as ">60 mL/min/1.73 m²," not as an exact number. For values *60 mL/min/1.73 m² and below*, the report should give the numerical estimate rounded to a whole number (e.g., "32 mL/min/1.73 m²"). There are three reasons for this recommendation:

1. The equation has been most extensively evaluated in people with chronic kidney disease and reduced GFR and is less accurate for persons with normal or mildly impaired kidney function.
2. Inter-laboratory differences in calibration of creatinine assays, and the imprecision of the assays, have their greatest impact in the near-normal range, and therefore lead to greater inaccuracies for values >60 mL/min/1.73 m².
3. Quantification of eGFR values of 60 mL/min/1.73 m² and below have more clinical implications for classification of kidney function than values above this level.

The above information can be found at the following link to the NKDEP's web site:

http://www.nkdep.nih.gov/resources/laboratory_reporting.htm

16.1 eGFR Example Prior to Modification

The following is an example of the routine prior to modification:

ACCESSION:	CH 0518 3
	05/18 1340d
CREATININE // .6	Calculated GFR:108
Select COMMENT:	
PATIENT, FEMALE	HRCN: 111110
Practitioner: PROVIDER, DEMO	LOC: IMA
ACCESSION:	CH 0518 3
	05/18 1340d
CREATININE	.6 mg/dL
GFR:108	Calculated

Figure 16-1: Partial listing of creatinine test input

16.2 eGFR Example After Modification

The following is an example of the routine after modification:

```
ACCESSION:                                CH 0518 4
                                           05/18 1349d
CREATININE //.6  Calculated GFR:>60
Select COMMENT:

PATIENT,FEMALE 2  HRCN: 111111          LOC: IMA
Practitioner: PROVIDER,DEMO

ACCESSION:                                CH 0518 4
                                           05/18 1349d
CREATININE                                .6  mg/dL  Calculated
GFR:>60
```

Figure 16.2 Partial listing of creatinine test input with BLREXECU modification

17.0 VA Patch 289: Delta Check for eGFR Test

Note: This is a VA Patch that adds a new eGFR test.

It *does not* replace nor supersede the Estimated GFR test that IHS sites have been using, which uses the same equation, and can still be used.

This patch is included because it is a mandatory VA Patch and other VA patches depend upon its existence.

LR*5.2*289 is a mandated installation of the estimated Glomerular Filtration Rate (eGFR) delta check routine. Site(s) can set up the two new laboratory tests, Creatinine (including eGFR) and eGFR, in either a new or an existing Serum Creatinine test. One of the new tests holds the input value (test result) and the other test holds the calculated output value. Both tests need to be set up in the same panel, which can be in either a new panel or an existing panel.

17.1 Background

Chronic kidney disease is a major public health problem. Adverse outcomes of chronic kidney disease can be prevented through early detection and treatment. Earlier stages of chronic kidney disease can be detected through routine laboratory measurements.

The United States Renal Data System (USRDS) provides reliable nationwide data regarding the incidence, prevalence, treatment patterns, outcomes, and cost of kidney failure treated by dialysis and transplantation, the most severe stage of chronic kidney disease. This guideline provides a definition of chronic kidney disease as well as definitions and estimates of prevalence of earlier stages of kidney disease.

Chronic kidney disease is defined according to the presence or absence of kidney damage and level of kidney function, irrespective of the type of kidney disease (diagnosis). Among individuals with chronic kidney disease, the stages are defined based on the level of kidney function. Identifying the presence and stage of chronic kidney disease in an individual is not a substitute for accurate assessment of the cause of kidney disease, extent of kidney damage, level of kidney function, comorbid conditions, complications of decreased kidney function, or risks for loss of kidney function or cardiovascular disease in that patient. Defining stages of chronic kidney disease requires "categorization" of continuous measures of kidney function, and the "cut-off levels" between stages are inherently arbitrary. Nonetheless, staging of chronic kidney disease will facilitate application of clinical practice guidelines, clinical performance measures, and quality improvement efforts to the evaluation and management of chronic kidney disease.

17.2 Reasons for estimated Glomerular Filtration Rate (eGFR)

In February 2002, the National Kidney Foundation recognized the Glomerular Filtration Rate as an indicator of renal function. The eGFR is calculated rather than measured, and the Washington, DC Medical Center has developed a routine known as a delta check that performs the calculation. The Washington delta check uses the serum creatinine result, age, and sex from the local VISTA Laboratory package. The new program will calculate the eGFR for African-Americans and others according to the accepted calculation.

It is important to note that National Kidney Foundation's "Kidney Disease Outcomes Quality Initiative (K/DOQI) Clinical Practice Guidelines for Chronic Kidney Disease: Evaluation, Classification, and Stratification" has stages of kidney disease based on eGFR and also action plan as per guidelines 1 & 2. These guidelines are published in the *American Journal of Kidney Diseases* Vol. 39, No. 2, supplement 1, February 2002.

Adverse outcomes of chronic kidney disease can often be prevented or delayed through early detection and treatment. Earlier stages of chronic kidney disease can be detected through routine laboratory measurements.

- The presence of chronic kidney disease should be established, based on presence of kidney damage and level of kidney function (glomerular filtration rate [GFR]), irrespective of diagnosis.
- Among patients with chronic kidney disease, the stage of disease should be assigned based on the level of kidney function, irrespective of diagnosis, according to the K/DOQI CKD classification Table 10.

Stage	Description	GFR (mL/min/1.73m ²)
1	Kidney damage with normal or increasing GFR	>=90
2	Kidney damage with mild decreasing GFR	60-89
3	Moderate decreasing GFR	30-59
4	Severe decreasing GFR	15-29
5	Kidney failure	<15 (or dialysis)

Figure 16-1: Stages of kidney disease based on level of kidney function

Note: Chronic kidney disease is defined as either kidney damage or GFR < 60 mL/min/1.73m² for >= 3 months. Kidney damage is defined as pathologic abnormalities or markers of damage, including abnormalities in blood or urine tests or imaging studies.

The Veteran's Health Administration (VHA) is probably one of the few organizations nationwide that has the potential to report eGFR whenever serum creatinine is done.

This will help us identify patients with kidney disease early and take preventive action. We will save about \$55,000 per year per patient for preventing or delaying dialysis. This does not take into account the morbidity associated with dialysis that will be prevented.

Raye-Anne Dorn, National Tumor Registry Coordinator, has submitted a New Service Request for the creation of a laboratory test, the estimated Glomerular Filtration Rate, eGFR. Thakor G. Patel, MD, Chief of Renal Diseases at Veterans Administration Central Office, endorses the request. The endorser is seeking an alternative to the creatinine clearance test, a laboratory test that measures renal function and requires all urine collected over a 24-hour period. The request cites the difficulty of collecting such a specimen, particularly from elderly patients. Additionally, the VHA Renal Program Office has recommended a standard process throughout VHA for performing and reporting the eGFR. The request is to release this locally created delta check as Class 1 software.

The four-variable MDRD Study equation is recommended. Although it has shortcomings, it has been more rigorously evaluated than the Cockcroft and Gault equation, and performs better in patients with kidney disease, gives results in units of ml/min/1.73 m², and does not require measurement of weight. Performance can be improved by calibration of the VA lab results with the MDRD Study lab (Cleveland Clinic). Is there a VA "central lab," that other labs relate to? If so, it should be possible to "calibrate" that lab to the MDRD Study lab. (Of course, there is no Cockcroft Gault central lab, so calibration is an uncorrectable error with the use of the Cockcroft and Gault equation.)

The view is that it is difficult to interpret GFR values above about 60 ml/min/1.73 m², due to differences in creatinine calibration among labs, and uncertainty in the measurement of GFR in that range. This is the reason that the NKF defined CKD Stage 3 as GFR < 60, and that there are few differences in the action plan for CKD stages 1 and 2 (kidney damage and GFR either greater than or less than 90). It is important to instruct practitioners about the limitations of GFR estimates above 60.

Stages of chronic kidney disease (R, O). Among individuals with chronic kidney disease, the stage is defined by the level of GFR, with higher stages representing lower GFR levels.

Table 12 illustrates the classification of individuals based on the presence or absence of markers of kidney disease and level of GFR, according to definition and staging of chronic kidney disease proposed by this guideline. In addition, it includes columns for the presence or absence of high blood pressure, because of the complex relationship of high blood pressure and chronic kidney disease.

Table 12: Definition and Stages of Chronic Kidney Disease					
GFR		With Kidney Damage*		Without Kidney Damage*	
Stages	60 ml/min /1.73 m ²	With HBP**	Without HBP**	With HBP**	Without HBP**
1	>= 90	1***	1***	High Blood Pressure	Normal
2	60-89	2***	2***	High Blood Pressure with eGFR	eGFR
3	30-59	3***	3***	3***	3***
4	15-29	4***	4***	4***	4***
5	<15 or dialysis	5***	5***	5***	5***

Figure 16-2: Stages of kidney disease based on levels of kidney damage and GFR

* Kidney damage is defined as pathologic abnormalities or markers of damage, including abnormalities in blood or urine tests or imaging studies.

** High blood pressure is defined as $\geq 140/90$ in adults and >90 th percentile for height and gender in children.

*** Represent chronic kidney disease; numbers designate stage of chronic kidney disease.

The results may be normal in infants and in the elderly, even if kidney disease is present.

All individuals with GFR <60 mL/min/1.73 m² for 3 months are classified as having chronic kidney disease, irrespective of the presence or absence of kidney damage. The rationale for including these individuals is that reduction in kidney function to this level or lower represents loss of half or more of the adult level of normal kidney function, which may be associated with a number of complications (Part 6).

All individuals with kidney damage are classified as having chronic kidney disease, irrespective of the level of GFR. The rationale for including individuals with GFR 60 mL/min/1.73 m² is that GFR may be sustained at normal or increased levels despite substantial kidney damage and that patients with kidney damage are at increased risk of the two major outcomes of chronic kidney disease: loss of kidney function and development of cardiovascular disease (Part 7).

17.3 The Four-Variable MDRD Study Equation

Estimated GFR (ml/min/1.73m²) = 186 x (Scr)^{-1.154} x (Age)^{-0.203} x (0.742 if female) x (1.210 if African - American)

Where:

Scr = serum creatinine in mg/dL

Age = age, in years

From: Simplified Equation To Predict Glomerular Filtration Rate from Serum Creatinine, Andrew S. Levey,(1) Tom Greene,(2) John W. Kusek,(3) Gerald J. Beck,(2) MDRD Study Group. (1) Boston, MA, (2) Cleveland, OH, (3) Bethesda, MD. JASN vol. 11:2000; abstract - A0828

Figure 16-3: Example of equation

We recently developed and validated an equation to predict GFR from serum creatinine (Pcr), which is more accurate than creatinine clearance measured from 24-hour urine samples or predicted from the Cockcroft-Gault (CG) equation (Levey AS, Ann Intern Med 1999; 130:877-884). GFR is expressed as ml/min/1.73 m². Required variables include Pcr (mg/dl), age (y), race (black vs. non-black), gender, serum urea nitrogen (SUN, mg/dl), and albumin (alb.g/dl).

In clinical practice and in retrospective studies, measurements of SUN and alb may not be available. Below, we list the full MDRD Study prediction equation (6 variables), as well as alternative prediction equations including fewer variables derived from measurements in the same 1628 patients.

GFR = 170 x Pcr^{-0.999} x age^{-0.176} x 1.180 (if black)
x 0.762 (if female) x SUN^{-0.170} x alb^{+0.318}

GFR = 270 x Pcr^{-1.007} x age^{-0.180} x 1.178 (if black)
x 0.755 (if female) x SUN^{-0.169}

GFR = 186 x Pcr^{-1.154} x age^{-0.203} x 1.212 (if black)
x 0.742 (if female)

Figure 16-4: MDRD study prediction equation

The table below compares the performance of these equations and the CG equation.

	R 2	Median A	75th % A	90th % A
6 variables	.903	11.3%	19.8%	28.4%
5 variables	.899	11.6%	19.9%	29.4%
4 variables	.892	12.1%	20.5%	29.7%
CG	.842	13.8%	26.4%	40.5%

Figure 16-5: Table comparing equation performances

A=absolute value of the median (50th), 75th, and 90th percentiles of the distribution of the differences between measured GFR and predicted GFR or Ccr for each equation (includes bias correction for CG equation). We conclude that simplified versions of the MDRD Study prediction equation provide more accurate estimates of GFR than measured or estimated creatinine clearance.

Example of input screen:

```

ACCESSION:                CH 0205 3          CH 0205 4
                          2/5 12:01d        2/5 12:50d

CREATININE //1.2

(MISSING PARAMETER)

** eGFR: 74.6
VOLUME //932
ELAPSED TIME //5.5
COMPUTED CREATININE CLEARANCE //23 L
CREATININE EGFR          74.6//
Select COMMENT: MISSING PARAMETER //
COMMENT: MISSING PARAMETER //
Select COMMENT:

```

Figure 16-5: Sample input screen after creatinine results are entered

Note: If the patient's race is 'Undeclared' or 'Unanswered,' the COMMENT field will be populated with 'MISSING PARAMETER' text. The doctor will be able to view this information within CPRS. The delta check will calculate the formula without the race variable. The doctor will need to evaluate this when viewing the reports in CPRS.

17.4 New Fields

There are four new fields: three TEST NAME FOR INPUT VALUEs (#60.1, #60.2, #60.3) and one TEST NAME FOR TEST OUTPUT VALUE (#61.1), which are stored in the file DELTA CHECKS (#62.1). The new fields are pointers to file LABORATORY TEST (#60). The new fields will be used by the delta check routine to get the DATA NAME (#400) field, which is a pointer to CHEM, HEM, TOX, RIA, SER, etc. DD File SUB-FIELD (#63.04). When the delta check routine is invoked, the routine calculates the eGFR from the test result, age, gender, and race. The results of the calculation are stored in the local array LRSB (DATA NAME).

File/Field	Field Name	Node;Piece	Field Type
62.1,60.1	TEST NAME FOR INPUT VALUE 1 5;1 LABORATORY TEST FILE (#60)		POINTER TO
	LAST EDITED:	SEP 24, 2002	
	DESCRIPTION:	This field is a pointer to a test that will contain the result value of the first incoming test. The result value should be stored in the variable LRSB(X) - where X is the data name IEN from ^DD(63.04.	
62.1,60.2	TEST NAME FOR INPUT VALUE 2 5;2 LABORATORY TEST FILE (#60)		POINTER TO
	LAST EDITED:	SEP 24, 2002	
	DESCRIPTION:	This field is a pointer to a test that will contain the result value of the first incoming test. The result value should be stored in the variable LRSB(X) - where X is the data name IEN from ^DD(63.04.	
62.1,60.3	TEST NAME FOR INPUT VALUE 3 5;3 LABORATORY TEST FILE (#60)		POINTER TO
	LAST EDITED:	SEP 24, 2002	
	DESCRIPTION:	This field is a pointer to a test that will contain the result value of the first incoming test. The result value should be stored in the variable LRSB(X) - where X is the data name IEN from ^DD(63.04.	
62.1,61.1	TEST NAME FOR OUTPUT VALUE 1 5;4 LABORATORY TEST FILE (#60)		POINTER TO
	LAST EDITED:	SEP 24, 2002	
	DESCRIPTION:	This field is a pointer to a test that will contain the result value of the first incoming test. The result value should be stored in the variable LRSB(X) - where X is the data name IEN from ^DD(63.04.	

Figure 16-6: Sample of new fields

The eGFR delta check will need to be associated with a new or existing Serum Creatinine test. The tests called EGFR and CREATININE (INCLUDES EGFR) will need to be set up and then associated with the Serum Creatinine.

Example of Laboratory Test Setup: (This is a display of entries in the file, not a captured example of a setup using FileMan).

```

NAME: CREATININE,SERUM
  TYPE: OUTPUT (CAN BE DISPLAYED)
    SUBSCRIPT: CHEM, HEM, TOX, SER, RIA, ETC.
    LOCATION (DATA NAME): CH;689024;1      FIELD: DD(63.04,689024,
    HIGHEST URGENCY ALLOWED: ROUTINE
    COMBINE TEST DURING ORDER: YES
    PRINT NAME: CREAT                          DATA NAME: CREATININE-EGFR
SITE/SPECIMEN: SERUM                          REFERENCE LOW: 0.7
  REFERENCE HIGH: 1.5                          UNITS: mg/dl
  TYPE OF DELTA CHECK: EGFR                     LOINC CODE: 2160-0
COLLECTION SAMPLE: BLOOD                       MIN VOL (in mls.): .2
  SINGLE DAY MAX ORDER FREQ: 1
INSTITUTION: WASHINGTON
ACCESSION AREA: CHEMISTRY
VERIFY WKLD CODE: Creatinine
VERIFY WKLD CODE #: 82565.0000
  CIS TEST CODE: CH017
SITE NOTES DATE: JAN 17, 2002
  NOTE:   Created per Raye-Ann Dorn.  Part of Creatinine (Includes
EGFR) panel.
  NATIONAL VA LAB CODE: Creatinine
  RESULT NLT CODE: Creatinine

NAME: EGFR
  TYPE: OUTPUT (CAN BE DISPLAYED)
    SUBSCRIPT: CHEM, HEM, TOX, SER, RIA, ETC.
    LOCATION (DATA NAME): CH;689023;1      FIELD: DD(63.04,689023,
    HIGHEST URGENCY ALLOWED: ROUTINE      PRINT NAME: EGFR
    DATA NAME: EGFR
SITE/SPECIMEN: SERUM
SYNONYM: ESTIMATED GLOMERULAR FILTRATION RATE
SYNONYM: GLOMERULAR FILTRATION RATE
INSTITUTION: WASHINGTON
ACCESSION AREA: CHEMISTRY
SITE NOTES DATE: JAN 17, 2002
  NOTE:   Per Raye-Ann Dorn.  Part of Creatinine (Includes EGFR)
panel.

NAME: CREATININE (INCLUDES EGFR)      TYPE: BOTH
  SUBSCRIPT: CHEM, HEM, TOX, SER, RIA, ETC.
  LAB COLLECTION SAMPLE: BLOOD
  HIGHEST URGENCY ALLOWED: ROUTINE
  PRINT NAME: CR EGFR
NUMBER: 1                                LAB TEST: CREATININE,SERUM
NUMBER: 2                                LAB TEST: EGFR
COLLECTION SAMPLE: BLOOD
INSTITUTION: WASHINGTON
ACCESSION AREA: CHEMISTRY
SITE NOTES DATE: JAN 17, 2002
  NOTE:   Per Raye-Ann Dorn.  Includes CREATININE EGFR and EGFR with
a delta check of EGFR.

```

Figure 16-7: Example of laboratory check setup

If you are setting up the eGFR delta check, use FILEMAN to set up the new DELTA CHECK fields. The TEST NAME FOR INPUT VALUE 1 field (#60.1) and TEST NAME FOR OUTPUT VALUE 1 field (#61.1) are pointers to DATA NAME field (#400) of the LABORATORY TEST (#60) files. These fields will be needed to run the delta check.

Example of Delta Check Setup: (This is a display of entries in the file, not a captured example of a setup using FileMan.)

```

NAME: EGFR
XECUTABLE CODE: D STRT^LREGFR(DFN,X)
DESCRIPTION: Created 10/17/01 by SDV for Dr. TG Patel and Raye-
Ann Dorn. Test is CREATININE-EGFR and its delta test is EGFR which
Lon Paredes set and tested. On 08/01/2002, JAH modified and sent
out as Class I software.
SITE NOTES DATE: AUG 01, 2002
TEST NAME FOR INPUT VALUE 1: CREATININE,SERUM
TEST NAME FOR OUTPUT VALUE 1: EGFR

```

Figure 16-8: Example of delta check setup

17.5 Setting Up INPUT and OUTPUT VALUE

Use FILEMAN to enter the INPUT and OUTPUT VALUE(s). These two pointers will store the file LABORATORY TEST (#60) IEN in the file DELTA CHECKS (#62.1). This information will be used to acquire the field DATA NAME (#400) for the Laboratory test, which was set up to call the delta check routine. Below is an example of a session:

```

Select OPTION: ENTER OR EDIT FILE ENTRIES

INPUT TO WHAT FILE: DISABILITY CONDITION// DELTA CHECKS
EDIT WHICH FIELD: ALL// ??

Choose from:
.01          NAME
10           XECUTABLE CODE
20           OVERFLOW 1
30           DESCRIPTION (word-processing)
31           SITE NOTES DATE (multiple)
60.1        TEST NAME FOR INPUT VALUE 1
60.2        TEST NAME FOR INPUT VALUE 2
60.3        TEST NAME FOR INPUT VALUE 3
61.1        TEST NAME FOR OUTPUT VALUE 1
FOLLOW A FIELD NAME WITH ';'CAPTION' TO HAVE THE FIELD ASKED
AS 'CAPTION:'
OR WITH ';T' TO USE THE FIELD 'TITLE' AS CAPTION
EDIT WHICH FIELD: ALL// 60.1 TEST NAME FOR INPUT VALUE 1
THEN EDIT FIELD: 61.1 TEST NAME FOR OUTPUT VALUE 1
THEN EDIT FIELD:

Select DELTA CHECKS NAME: EGFR
TEST NAME FOR INPUT VALUE 1: CREATININE,SERUM//
TEST NAME FOR OUTPUT VALUE 1: EGFR//

```

Figure 16-8: Sample session to set up input/output values

17.6 VA Test Sites

- Washington D.C.
- VA Wilmington
- Long Beach VAMC Laboratory
- VAMHCS, PERRY POINT DIVISION

17.7 Routine Summary

The following routines are included in this patch. The second line of each of these routines now looks like:

;;5.2;LAB SERVICES;<patchlist>;Sep 27, 1994			
Routine	Checksum		2nd Line
	Old	New	
LREGFR	n/a	2490467	**289**

Figure 16-9: Example of routine summary

18.0 VA Patch 287: Process Auto Instrument Duplicate Comments

Patch LR*5.2*287 corrects a defect reported in NOIS ALB-0602-52815. Duplicate comments were not being stored with results when verifying automated instrument or load work list data. This patch will allow the site to specify on a load/work list basis whether or not duplicate comments will be stored with lab results when verifying the accession.

A new field STORE DUPLICATE COMMENTS (#2.2) in PROFILE multiple (#68.23) of file LOAD/WORK LIST (#68.2) will determine if duplicate comments are stored when processing results from a load/work list. When the Laboratory result verifying software is processing comments associated with a load/work list result, this field determines how duplicate comments are processed. If set to "NO" (default if no value) then a comment that matches a previously stored comment will not be stored with the result. If set to 'Yes' then the duplicate check is not performed and the comment is stored with the results regardless if the comment already exists. Setting it to 'Yes' will allow the handling of multiple line comments which contain the same comment more than once and are still clinically significant.

Edit the default parameters Load/Work list. [LRLLE DFT] option has been modified to allow configuring this field.

18.1 VA Test Sites

- Albuquerque VAMC

18.2 Routine Summary

The following routines are included in this patch. The second line of each of these routines now looks like:

```
<tab> ;;5.2;LAB SERVICE;<patchlist>;Sep 27, 1994
```

Routine Name	Checksum Before Patch	Checksum After Patch	Patch List
LR287	N/A	5220883	**287** (Deleted by KIDS)
LRVR4	8885386	8885642	**14, 42, 121, 153, 221, 263, 279, 283, 287**

Figure 17-1: Example of routine summary

19.0 VA Patch 299: Remove Bad BB Field Reference

This patch resolves the following problem:

Some old M code is referencing a non-existent field in the LABORATORY TEST file (#60). The field was original meant for Blood Component definitions, but was never implemented. The field referenced in the code has caused an error at one site.

This patch removes the reference to the non-existent field so the error will no longer occur. It was found that this code also referenced a routine that is no longer needed (LR7OFB0), which is being deleted with this patch.

19.1 VA Test Sites

- Hines VAMC

19.2 Routine Summary:

The following routines are included in this patch. The second line of each of these routines now looks like:

CHECK^XTSUMBLD results			
Routine Name	Before Patch	After Patch	Patch List
=====	=====	=====	=====
LR7OF1	13231733	12846415	121,187,223, 256,299
LR7OU0	6871123	5520184	121,187,265, 299

Figure 18-1: Example of routine summary

20.0 VA Patch 310: Restore Routines Released in VA Patch LR*5.2*301

Note: IHS has *not* incorporated VA Patch 301 in any of its patches. This VA Patch is included because it is a mandatory VA Patch and other VA patches depend upon its existence.

Installation of LR*5.2*301 (Released 9/15/03) has created a potential patient safety issue.

After installation of patch LR*5.2*301, Blood Bank units that are positive for an antigen that corresponds to a patient's antibody are not detected by the Blood Bank Software during unit selection, unit crossmatch, or unit issue.

Because the patient's antibody is displayed on the screen during the patient processing, this should initiate each facility's own internal processes for performing the actual antigen typing on all units. The potential for patient harm is possible, but the likelihood that such an event actually occurred is low. As a precaution, a facility should review transfusion records of any patients with an antibody that occurred since the installation of LR*5.2*301 to ensure that proper antigen testing did get performed.

Emergency patch LR*5.2*310 is being released to restore the routines, LR7OR1, LRDPA1, and LRDPA2 to their pre-patch LR*5.2*301 state. If you have installed patch LR*5.2*301, because of the potential patient safety issues, is it recommended that you immediately install patch LR*5.2*310. Directive 2001-023 dictates it be installed within 24 hours for an Emergency patch.

For those sites that *did not* install LR*5.2*301, since it has now been marked as "Entered In Error" in the Patch Module, LR*5.2*301 should not be installed and is no longer available in the patch module. The sites that did not install LR*5.2*301 *must* still install LR*5.2*310 even though the routines before and after install remain the same. This is required because LR*5.2*310 will make a change to the second line, adding 310 to the patch list, which will be required in future patches.

20.1 Routine Summary

The following routines are included in this patch. The second line of each of these routines now looks like:

```

<tab>;;5.2;LAB SERVICE; **[patch list]**; Sep 27, 1994

```

CHECK^XTSUMBLD results			
Routine name	Before Patch	After Patch	Patch List
=====	=====	=====	=====
LR7OR1	13239118	13239118	121,187,219, 230,256,310
LRDPA1	6551829	6551829	1,153,201,310
LRDPA2	5207196	5207196	310

Figure 19-1: Example of routine summary

Patch LR*5.2*301 will no longer be listed in the second line of these routines.

21.0 VA Patch 307: DSS Lab Results Site/Specimen Expansion

This patch implements a request from Decision Support System to expand the lab results site/specimen entries to include FECES as an additional choice. At present the only two choices are BLOOD and URINE. The test "Occult Blood" is almost always performed on stool (i.e. feces) samples, therefore FECES is needed as a possible choice.

21.1 Routine Description:

The LRCAPDAR routine was originally designed such that it recognized site/specimen types "BL" for blood and "UR" for urine. To add additional specimens, the routine had to be modified by adding a new line of code for each new specimen. Each such change required a new LR patch. In an effort to reduce the dependency of DSS on the laboratory team, and to make the routine more efficient, it was decided to generalize the site/specimen definition. The new LRCAPDAR routine reads all of the laboratory site/specimen values. All of these values are now stored in an array in a format that DSS recognizes. The DSS application can now add specimens as needed without incurring any delays resulting from the laboratory team development process.

Note: This patch is a companion to the ECX*3.0*51 patch. LR*5.2*307 is not called by any menu option and does not have any user interface. Patch LR*5.2*307 *must* be installed for the ECX*3.0*51 patch to work.

21.2 VA Test Sites

- Portland, OR
- Murfreesboro, TN

21.3 Routine Summary

The following routines are included in this patch. The second line of each of these routines now looks like:

CHECK^XTSUMBLD results			
Routine name	Before Patch	After Patch	Patch List
=====	=====	=====	=====
LR307	n/a	2107378	**307**
LRCAPDAR	8070808	7334799	143,169,258,307

Figure 20-1: Example of routine summary

22.0 VA Patch 305: Not Allowing Lab to Add Patients to the Patient File

Currently, the Laboratory application contains functionality that will allow the user to add a new patient to the PATIENT (#2) file from within the Laboratory Application. However, due to IT Service Request 20030306 Patient Identity Management Services and HDR (Health Data Repository) Pilot, it has been requested that all ancillary applications, including Laboratory Service, remove such functionality. For more information on this service request, view the following link:

<http://vista.med.va.gov/pas/ViewTrackingRecord.asp?RequestID=20030306>

Most, if not all, sites are not using the functionality that allows a patient name to be added to the PATIENT (#2) file from the patient name prompt within Lab menu options. However, the functionality is in place and may be used if the site has the ALLOW LAB TO ADD PATIENTS (#13) field of the LABORATORY SITE (#69.9) file set to 'Yes.' If this field is set to 'Yes,' any patient name prompt will accept a new patient name, one that does not currently exist in the PATIENT(#2) file, if the new patient name is entered twice. See the example below:

```

Select Laboratory DHCP Menu Option: 1  Phlebotomy menu

    Add tests to a given accession.
    Add tests to an already existing order number.
    Delete entire order or individual tests
    Itemized routine lab collection
    Lab orders by collection type
    Lab test order
    List of lab orders not collected
    List of orders not collected (Long form)
    Order/test status
    Print collection list/labels
    Print future collection labels
    Print single future collection label
    Receipt of routine lab collection from wards
    Test description information
    Ward lab menu ...

Select Phlebotomy menu Option: LAB TEST order

Select Patient Name: NEWPATIENT,JANE ??
Select Patient Name: NEWPATIENT,JANE
  ARE YOU ADDING 'NEWPATIENT,JANE' AS A NEW PATIENT (THE 239TH)?
No// Y (Yes)
  PATIENT SEX: F FEMALE
  PATIENT DATE OF BIRTH: 03121975 (MAR 12, 1975)
  PATIENT SOCIAL SECURITY NUMBER: 111223333
  PATIENT TYPE: ?
  PATIENT TYPE: TRICARE
  PATIENT VETERAN (Y/N)?: Y YES
  
```

Figure 21-1: Adding a new patient name

A number of patient demographic fields are prompted before resuming the prompting of fields required for the LAB TEST ORDER [LROW] option. Most options in Laboratory Service permit new patient names to be entered in the format shown above. Patch LR*5.2*305 was created to remove this functionality from within the Laboratory Service application.

The following two changes to existing functionality are included in this patch:

4. The ALLOW LAB TO ADD PATIENTS (#13) field of the LABORATORY SITE (#69.9) file has been modified so that it can no longer be set to 'Yes.' 'No' is now the only answer allowed.
5. The patient name prompt in menu options within Laboratory Service has been modified to no longer allow a new patient to be added to the PATIENT (#2) file from within Lab. See the example below:

```
Select Laboratory DHCP Menu Option: 1  Phlebotomy menu

    Add tests to a given accession.
    Add tests to an already existing order number.
    Add to collection list
    Delete entire order or individual tests
    Itemized routine lab collection
    Lab orders by collection type
    Lab test order
    List of lab orders not collected
    List of orders not collected (Long form)
    Order/test status
    Print collection list/labels
    Print future collection labels
    Print single future collection label
    Receipt of routine lab collection from wards
    Test description information
    Ward lab menu ...

Select Phlebotomy menu Option: LAB TEST order

Select Patient Name: NEWPATIENT,JANE ??
Select Patient Name: NEWPATIENT,JANE ??
Select Patient Name: NEWPATIENT,JANE ??
Select Patient Name:

The new patient name NEWPATIENT, JANE is not accepted.
```

Figure 21-2: New patient name is not accepted from within the lab

22.1 VA Test Sites

- Muskogee, OK
- Boston HCS
- Cheyenne VAMC
- Columbus VAMC

22.2 Routine Summary

The following routine(s) are included in this patch. The second line of each routine now looks like:

```

<tab>      ;:5.2;LAB SERVICE;**[patch list]**; Sep 27, 1994

```

Routine Name	Checksum Before Patch	Checksum After Patch	Patch List
LR305	N/A	5010875	**305** (Deleted by KIDS)
LRDPA	7837880	7840899	
137,121,153,202,211,248,			305

Figure 21-3: Example of routine summary

22.3 Post Install: Update ALLOW LAB TO ADD PATIENTS Field

After installation, use FileMan to verify that the ALLOW LAB TO ADD PATIENTS (#13) field of the LABORATORY SITE file (#69.9) is set to 'No.' If not, set it to 'No.' 'No' is the only setting allowed after patch installation.

23.0 VA Patch 313: EGFR Delta Check and Automated Instrument Interfaces

This patch corrects several defects reported with the eGFR delta check released in patch LR*5.2*289 DELTA CHECK FOR EGFR TEST.

It was reported the eGFR calculation delta check was not triggered when processing creatinine results via option Enter/verify data (auto instrument) [LRVR]. The delta check will be triggered when the creatinine value is entered and/or changed, or when the eGFR has not been calculated. If the eGFR is a required test and the result is 'pending,' then the delta check will attempt to calculate the eGFR.

The comment "MISSING PARAMETER" generated when the patient's race is 'Undeclared' or 'Unanswered' is changed to "For eGFR: Race unknown, if African-American multiply result by 1.210."

The delta check will determine the patient's race using the following criteria:

- a. If specimen for a PATIENT file (#2) patient, the race is determine using supported API VADPT.
- b. If specimen for a REFERRAL PATIENT file (#67) patient, the race is determined based on RACE field (#.06) in REFERRAL PATIENT file.
- c. All other patient types will not use race as a parameter in the calculation. These patient types will generate the 'race unknown' comment.

During patch development, it was determined that the lock placed on the accession being verified could be prematurely released. This defect could allow two or more users to edit the accession concurrently. The delta check has been changed to eliminate the releasing of the lock. The lock will now be released by the lab verifying options.

During patch testing, a potential safety issue was identified with the delta check with regards to display of abnormal/critical creatinine values. The delta check displayed eGFR exception messages as part of the display of creatinine abnormal/critical flags. These eGFR exception messages will be added as accession comments and not displayed as part of the creatinine result display.

The eGFR exception messages that will be added as comments are:

Condition	Comment
No Patient Age	"For eGFR: **eGFR not Calculated - No Age Recorded**"
No Patient Sex	"For eGFR: **eGFR not Calculated - No Sex Recorded**"
Race Unknown	"For eGFR: Race unknown, if African American multiply result by 1.210"
Delta Check Incorrectly Configured	"For eGFR: **eGFR not Calculated - Delta check not configured**" NOTE: this comment generated when field TEST NAME FOR OUTPUT VALUE 1 (#61.1) is blank for the eGFR delta check entry in DELTA CHECKS file (#62.1).
Creatinine Changed and eGFR not in editing profile	"For eGFR: **eGFR not in test editing profile - Creatinine Changed**"

Figure 22-1: eGFR exception messages

When no patient age or sex is identified, "canc" will be entered as the eGFR test result.

NOIS FGH-0304-32518 reported the eGFR calculation was being performed and the result added to the accession when there was no ordered test for the eGFR. This prevents user from verifying and releasing test results. The eGFR delta check will check for the eGFR test in the test editing profile selected by the user. If the eGFR test is not in the editing profile then it will not be calculated. If the creatinine value is changed, the eGFR test is not in the editing profile and there is a previous eGFR result then the exception message "For eGFR: **eGFR not in test editing profile - Creatinine Changed**" will be generated.

When the eGFR delta check is called by option Group data review (verified & EM) [LRGVP] the delta check will quit with no action taken.

See patch LR*5.2*289 DELTA CHECK FOR EGFR TEST for instructions on setting up and configuring the eGFR delta check.

23.1 VA Test Sites

- Albuquerque VAMC - VMS/DSM
- Durham VAMC - VMS/DSM
- Iron Mountain VAMC - VMS/Cache
- Maryland HCS - VMS/DSM

- Milwaukee VAMC - VMS/DSM
- North Florida/South Georgia HCS - VMS/DSM
- Shreveport VAMC - VMS/DSM
- Tomah VAMC - VMS/Cache
- Upstate New York HCS - VMS/DSM

23.2 Routine Summary

The following routines are included in this patch. The second line of each of these routines now looks like:

```
<tab> ;;5.2;LAB SERVICE;<patchlist>;Sep 27, 1994
```

Routine Name	Checksum		Patch List
	Before Patch	After Patch	
LR313	N/A	4332118	**313** (Deleted by KIDS)
LREGFR	2490467	3964631	**289,313**

Figure 22-2: Example of routine summary

24.0 VA Patch 312: CPRS Most Recent Results Error

This patch resolves the following problem:

When viewing Lab results in the CPRS GUI, under the Labs Tab with the Most Recent Labs selected, an error is occurring:

```
$ZE= EN1+1^LR7OSMZ0:1, %DSM-E-UNDEF, undefined variable
^LR(123596,"MI",6968975.888389,0), -DSM-I-ECODE, MUMPS error code:
M7
```

Figure 23-1: Error message received

This only happens when the collection date/time for a patient specimen is the same for a Chemistry test (CH subscript) and a Microbiology test (MI subscript).

Related to this problem is a problem described in many of the VA NOIS's listed below. Here is a description from one of the NOIS with a good example of the problem that this patch resolves:

Some lab tests with an MI subscript are not displayed when scrolling backward using the Most Recent display on the labs tab. As an example, a patient had an O&P exam ordered along with other lab tests.

Using the Most Recent display on the Labs tab and scrolling backward (using the < button) through the results, the following results are displayed:

- | | |
|----|--------------------------|
| 1. | C.difficile |
| 2. | Fat Screen |
| 3. | Other CH subscript tests |

Figure 23-2: Lab test results

The O&P result is not displayed. If you then scroll forward (using the > button), the O&P result is displayed, but the Fat Screen and C.difficile result can no longer be viewed, i.e. the O&P result is shown as the last result (most recent).

We are running version 19 of CPRS.

This problem had been reported previously in version 17 of CPRS. In that version an error message was displayed when scrolling forward toward the most recent result.

24.1 Routine Summary

The following is a list of the routine(s) included in this patch. The second line of each of these routine(s) will look like:

```

<tab>;;5.2;LAB SERVICE; **[patch list]**; Sep 27, 1994

```

Routine name	CHECK^XTSUMBLD results		
	Before Patch	After Patch	Patch List
LR7OGM	7564960	8016197	187,220,312
LR7OGMC	5014761	5100174	187,230,312
LR7OGMM	4414077	4440093	187,312
LR7OGMU	1515786	1285738	187,312

Figure 23-2: Example of routine summary

25.0 VA Lab Patch 340: Correct Display of Unverified Results in CPRS/ORDERS

This patch updates the retrieval of Lab Results to only return verified Results when called on by CPRS via the Orders tab.

This patch also removes unused Blood Bank functionality from the routine LR7OR1 in support of the VBECS (Vista Blood Establishment Computer Software) Blood Bank Modernization Project.

25.1 Routine Summary

The following is a list of the routine(s) included in this patch. The second line of each of these routine(s) will look like:

<tab>;;5.2;LAB SERVICE; **[patch list]**; Sep 27, 1994			
Routine name	Before Patch	CHECK^XTSUMBLD After Patch	results Patch List
=====	=====	=====	=====
LR7OR1	13239118	12787734	121,187,219,230,256, 310,340

Figure 24-1: Example of routine summary

26.0 Glossary

Term	Definition
Caché	A multidimensional database that uniquely combines robust objects and robust SQL, thus eliminating object-relational mapping.
Caché ObjectScript	A variant of MUMPS specifically designed for the Caché environment.
CPRS	VA Computerized Patient Record System.
EHR	Electronic Health Record. An Electronic Medical Record that utilizes a technical infrastructure originally developed for the VHA that displays various clinical functions via a graphical user interface (GUI).
File	A set of related records or entries treated as a single unit.
FileMan	The database management system for RPMS.
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).
IEN	Internal Entry Number. A unique number used to identify an entry within a file.
IHS	Indian Health Service.
LOINC	Logical Observation Identifier Naming Codes
Menu	A list of choices for computing activity. A menu is a type of option designed to identify a series of items (other options) for presentation to the user for selection. When displayed, menu-type options are preceded by the word "Select" and followed by the word "option" as in Select Menu Management option: (the menu's select prompt).
MUMPS	Massachusetts General Hospital Utility Multiprogramming System. It is a procedural, interpreted general-purpose programming language oriented towards database applications.
OIT	Office of Information Technology
RPMS	Resource and Patient Management System. A suite of software applications used at IHS facilities to support

Term	Definition
	administrative, clerical, and clinical functions.
WKLD CODE	Workload Code. Sometimes referred to as VA National Laboratory Test (NLT) codes.

27.0 Contact Information

If you have any questions or comments regarding this distribution, contact the OIT User Support (IHS) by:

Phone: (505) 248-4371 or
(888) 830-7280

Fax: (505) 248-4363

Web: <http://www.ihs.gov/GeneralWeb/HelpCenter/Helpdesk/index.cfm>

Email: support@ihs.gov