

# IHS Support for HL7 Interfaces (BHL) Version 1.0

**Technical Manual** 

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# Preface

The Indian Health Service (IHS) Support for Health Level Seven (HL7) Interfaces software package (BHL) provides a way for Resource and Patient Management System (RPMS) applications to exchange health-care data with commercial off-the-shelf and other applications using the HL7 protocol. This package utilizes the Department of Veteran Affairs (VA) Decentralized Hospital Computer Program (DHCP) HL7 system. This technical manual has been written for Site Managers and other information systems personnel who are responsible for the support and maintenance of the BHL software package.

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# Indian Health Service (IHS) Support for Health Level Seven (HL7) Interfaces Version 1.0 Technical Manual

## 1. Introduction

The IHS HL7 package consists of a set of routines that are installed concurrently with the DHCP HL7 Package (see Section 3 of the IHS HL7 Installation Guide for Resource Requirements). Documentation for the IHS code consists of the Installation Guide and the Technical Manual (this document).

This manual provides technical information and bulletin descriptions for use by appropriate personnel to correct errors that may occur during the transmission or receipt of information through the HL7 interface.

Please refer to the DHCP HL7 Version 1.6 User Manual, Security Guide, Developer's Manual, Installation Guide, Release Notes, and Technical Manual for additional information as required. For general information on common programming conventions, please refer to the *Users Guide to Computing*.

## 2. Routines and Archiving

## 2.1 Routine Descriptions

Routines	Description
BHLBCH, BHLBCH1, BHLBCH2	Process incoming CHR data messages
BHLBPS, BHLBPS1	Process incoming pharmacy data messages
BHLI*	FileMan INIT routines.
BHLRXPS1, BHLRXPS2, BHLRXPST	Post-init routines.

## 2.2 Archiving / Purging

There are no archiving or purging requirements associated with this package.

## 2.3 Callable Routines

There are no supported, callable routines in this package.

## 3. Package Relationships

## 3.1 External Relationships

The BHL package is not a standalone code path. It relies on the VA's DHCP HL7 package to receive HL7 messages from another system. When a message is received, the BHL code is called to parse the message and file the data elements in the appropriate PCC locations.

The following minimum package versions are required in order to install this version of IHS HL7:

#### Kernel 7.3 Toolkit

If you are installing the BHL package as an adjunct to the Community Health Representative (CHR) package, the Kermit Protocol option must be installed. Refer to the Kernel Toolkit V 7.3 Installation Guide for the proper procedures and requirements.

## DHCP HL7 1.6

See the DHCP HL7 Installation Guide for requirements (minimum versions and resource consumption) prior to installing the DHCP HL7 package.

## 3.2 Internal Relationships

Not Applicable. The BHL code is called from the DHCP HL7 1.6 package.

## 4. Community Health Representative (CHR) System

No IHS HL7 bulletins are associated with the CHR installation. Everything associated with the CHR system is completed during installation of the CHR package itself.

## 5. Commercial, Off-The-Shelf (COTS) Pharmacy System

The IHS HL7 package might generate one or both of two bulletins during the processing of an incoming message from a COTS Pharmacy system. One deals with fatal errors; that is, errors that prevent the filing of the incoming information. The other deals with nonfatal errors - those that involve, for example, a mismatch of noncritical data or some other circumstance that indicates human intervention might be required. Each of these error types is described in the following sections.

## 5.1 BHLBPS Rx-PCC Link Warning Bulletin

#### **5.1.1 Sample Bulletin**

The following bulletin is a sample of the message that will be generated when a nonfatal error is discovered. *Nonfatal* means that there was a mismatch in checking incoming data from the COTS Pharmacy system against corresponding data in the RPMS Patient Care Component (PCC) database, but that the mismatch would not automatically prevent the data in the message from being filed.

Subj: Rx => PCC DATA ERROR [#71068] 22 Aug 96 13:44 30 Lines From: POSTMASTER (Sender: EXAMPLE,EDWARD) in 'IN' basket. Page 1 \*\*NEW\*\*

This is a message to inform you that a data error was detected while processing an HL7 message from the COTS Pharmacy system. Depending on the type of error that was detected, inaccurate data may have been entered into the PCC database, and it may be necessary to correct one or more items in the PCC database. After noting the errors listed below, refer to the IHS HL7 technical manual for information on how to correct each error.

#### DATA RECEIVED:

PCC patient name:	WATSON, CHEVY
Pharmacy patient name:	WATSUN, CHEVY
Patient's chart number:	234987
Drug name:	AMBITHOL
Drug dispense date:	AUG 15,1996@10:16
Ordering provider:	TOPHAT, COSMO AV8662264
PCC provider name:	TOPPER,COSMO

ERRORS DETECTED:

DRUG ENTRY COULD NOT BE FOUND BY NAME OUTSIDE DRUG ENTRY NOT IN DRUG TABLE PROVIDER NAME MISMATCH PAT NAME FROM PHARMACY SYSTEM DOES NOT MATCH PAT REG

For detailed information on how to correct these errors, refer to the IHS HL7 technical manual.

## 5.1.2 Bulletin Messages

## 5.1.2.1 Drug Entry Could Not Be Found by Name

This error is reported when a prescription is passed from the COTS Pharmacy system and the drug lookup failed in File 50 (Drug file).

A drug was passed to the PCC that does not exist in the Drug file. You must enter the drug into the Drug file. Be sure to check whether the drug already exists, but is spelled differently. The name of the drug in the Pharmacy system must match exactly the name of the drug in the Drug file. After you add or change the Drug file entry, you should correct the patient / visit drug information by using the RX mnemonic in the Enter PCC Data Using Item List Display option and entering the drug name when prompted to do so. Unless the bulletin also reports the "Outside Drug" error shown below, the medication was added to PCC but with a name of "Outside Drug." This should be corrected.

## 5.1.2.2 Outside Drug Entry Not in Drug Table

This error is reported when a prescription is passed from the COTS Pharmacy system, the Drug file (File 50) lookup failed, and "Outside Drug" is not defined in the Drug file.

A drug was passed to the PCC that does not exist in the Drug file. Normally, the medication would be added to PCC as an "Outside Drug" (See "Drug Entry" error, above), but this could not be done because "Outside Drug" is not defined in the Drug file. First, you must enter the drug into the Drug file. Be sure to check whether the drug already exists, but is just spelled differently. The name of the drug in the Pharmacy system must match exactly the name of the drug in the Drug file. After you add or change the drug name in the Drug file, you should correct the patient / visit drug information by using the RX mnemonic in the Enter PCC Data Using Item List Display option and entering the drug name when prompted to do so. You should also create an entry for "Outside Drug" in the Drug file to prevent additional errors of this type.

## 5.1.2.3 Pat Name from Pharmacy System Does Not Match Pat Reg

This error is a warning that a V MED or Visit file entry was created under a patient's chart, but the name of the patient did not exactly match the name of the patient from Patient Registration (PCC database). The names should be brought into sync in both systems.

As shown in the bulletin, the patient name in the Patient Registration (PCC database) does not match the name being sent from the Pharmacy system. The chart number, sex, date of birth (DOB), and Social Security Number (SSN) (if present) matched exactly. This visit should be reviewed. Also, if appropriate, the name in the Pharmacy system should be changed to match the name in Patient Registration.

## 5.1.2.4 Provider Name Mismatch

This error is reported when a prescription is passed from the COTS Pharmacy system and the PCC provider lookup by Drug Enforcement Agency Number (DEA #) did not find the same provider name that was given by the Pharmacy system. On the bulletin that reported this error, the pharmacy provider name and DEA # are listed as "Ordering Provider." The PCC name that corresponds to that same DEA # is listed as "PCC Provider Name."

The PCC Provider file contained the provider DEA # as given by the Pharmacy system, but the corresponding provider name in the PCC database did not match the provider name given by the Pharmacy system. The entry was created using the DEA# and corresponding PCC provider name. Two scenarios may explain this error. These possibilities and the recommended actions for correcting the errors are as follows:

If the DEA # is correct, the corresponding provider name in either the PCC or the Pharmacy system should be changed so that the names in both systems match.

If the DEA # is not correct, it should be corrected in the Pharmacy system. In addition, the PCC data that was entered with the incorrect DEA # should be changed to show the correct DEA #.

#### 5.1.2.5 Provider Name Not Provided by Rx System

This error is reported when a prescription is passed from the COTS Pharmacy system and the prescription data did not include a name for the provider.

Data was entered into PCC based on a lookup of the provider DEA #. The following actions should be taken:

Verify that the DEA # lookup found the correct provider (i.e., that the data was entered using the correct provider). If incorrect, update the PCC data to use the correct provider. Update the Pharmacy system database to include the name of the provider.

#### 5.1.2.6 Provider DEA # Not Provided by Rx System

This error is reported when a prescription is passed from the COTS Pharmacy system and the prescription data did not include a DEA # for the provider.

Data was entered into the PCC based on a lookup of the provider name. The following actions should be taken:

Verify that the name lookup found the correct provider (i.e., that the data was entered using the correct provider). If incorrect, update the PCC data to use the correct provider. Update the Pharmacy system database to include the DEA # for the provider.

#### 5.1.2.7 Provider DEA # Not Found in PCC Database

This error is reported when a prescription is passed from the COTS Pharmacy system and the corresponding provider in the PCC database does not have a DEA #.

Data was entered into PCC based on a lookup of the provider name. The following actions should be taken:

Verify that the name lookup found the correct provider (i.e., that the data was entered using the correct provider). If incorrect, update the PCC data to use the correct provider. Update the PCC database to include the DEA # for the provider, if the provider has one.

## 5.2 BHLBPS Rx-PCC Link Error Bulletin

#### 5.2.1 Sample Bulletin

The following bulletin is a sample of the message that will be generated when a fatal error is discovered. *Fatal* means that, for any of various reasons, the incoming message could not be processed and the RPMS PCC database was not updated. These reasons may include, but are not limited to, an incorrect message (missing data segments or fields), a mismatch in one or more critical data fields, or other problems. Each of these reasons is presented in the following sections with a recommended course of action.

Subj: Rx => PCC MESSAGE ERROR [#71119] 03 Oct 96 10:11 10 Lines From: POSTMASTER (Sender: EXAMPLE,EDWARD) in 'WASTE' basket. Page 1

This is a message to inform you that a message from the COTS pharmacy system could not be processed due to an error condition. The specific error is listed below. The pharmacy message was rejected and the COTS pharmacy system was notified of the error via an HL7 Application Error message. After noting the error listed below, please refer to the IHS HL7 technical manual for information on how to resolve the error.

Error Message: VISIT DATE FAILED INPUT TRANSFORM Error Data: VISIT DATE = 2960931@12:00 Message IEN: 247

## 5.2.2 Bulletin Messages

The Link Error bulletin is issued whenever there is an error that is reported back to the COTS Pharmacy system. In almost all cases, the data in the message was not filed in the PCC. The sections below describe the various errors in more detail. If the cause of the error cannot be found, or if more information is needed, a programmer can use the Message Internal Entry Number (Message IEN) listed on the bulletin to examine the original message and identify the source of the error. If the error is due to a specific data item, the value of that data item is shown on the bulletin.

## 5.2.2.1 Missing Med Info

- 5.2.2.2 Missing Visit Info
- 5.2.2.3 Missing External Key

## 5.2.2.4 Missing Patient Demographics

## 5.2.2.5 Missing Data (followed by a list of data items)

### **5.2.2.6** Missing Message Segment(s) (followed by a list of segments)

The above errors are reported when a prescription is passed from the COTS Pharmacy system and portions of the HL7 message or required data items are missing.

The data in the HL7 message was not filed and an error message was sent to the Pharmacy system. These errors indicate a problem with the Pharmacy system. The following action should be taken:

Correct the error in the Pharmacy system that caused it to send an incomplete message to the PCC.

## 5.2.2.7 Provider from Rx System Failed Edit

This error is reported when a prescription is passed from the COTS Pharmacy system and the provider lookup failed in the Provider file.

The data in the HL7 message was not filed and an error message was sent to the Pharmacy system. The following action should be taken:

If the provider is a provider at your facility (full-time, part-time, or temporary), this provider should be added to the Provider file. If the provider is already in the Provider file, but the provider's name is spelled differently, the name should be changed in either the Pharmacy system or in the Provider file so that the names match.

## 5.2.2.8 Provider DEA # Mismatch

This error is reported when a prescription is passed from the COTS Pharmacy system and the provider is found by name in the PCC.

The DEA # for the provider, as listed in the PCC, is different than the DEA # for the provider, as listed in the message from the Pharmacy system. The data in the HL7 message was not filed and an error message was sent to the Pharmacy system. The following action should be taken:

Verify that the provider matched by name is the correct provider. If it is, correct the DEA # in either the PCC or the Pharmacy system so that they match. If the provider matched by name is incorrect, either add the correct provider name to the PCC or edit the Pharmacy system to use the correct provider name.

## 5.2.2.9 Outside Drug Entry Not in Drug Table

This error is reported when a prescription is passed from the COTS Pharmacy system and the drug lookup failed in the Drug file.

Normally, when a drug is not found in the Drug file, it is entered as "Other Drug." This error indicates that "Other Drug" does not exist in the Drug file, so the data could not be entered into the PCC. The data in the HL7 message was not filed and an error message was sent to the Pharmacy system. The following action should be taken:

Define "Other Drug" in the Drug file. Check the name of the drug in the original message and define it in the Drug file, unless you want it to be filed as "Other Drug."

## 5.2.2.10 Visit Creation Failed

### 5.2.2.11 V MED Creation Failed

## 5.2.2.12 V MED Failed on Edit

The above errors are reported when a prescription is passed from the COTS Pharmacy system and the attempt to add or edit data in the PCC failed.

These errors indicate a problem with filing data in the PCC. The PCC reported an error condition when trying to create a new file entry or edit an existing file entry. The data in the HL7 message was not filed and an error message was sent to the Pharmacy system. These errors indicate a problem with the Pharmacy system. The following action should be taken:

Manually create a Visit or V MED file entry in the PCC to determine if there is a problem with the PCC. If no problem is found, a programmer can use the Message IEN to reprocess the message and find the cause of the error.

## 5.2.2.13 Cannot Find V MED for Edit

## 5.2.2.14 Cannot Find V MED for Delete

The above errors are reported when a prescription is passed from the COTS Pharmacy system and the attempt to look up the V MED file entry failed.

These errors indicate that the Pharmacy system is attempting to edit or delete a V MED file entry that is not in the PCC. The data in the HL7 message was not filed and an error message was sent to the Pharmacy system. The following actions should be taken:

Make sure that the V MED file entry listed is the correct one. If not, correct the Pharmacy system to send the correct data. Otherwise, if the error is a delete error, no action needs to be taken since the end result of a successful delete would be the status quo—the V MED file entry is not in the PCC.

If the V MED file entry is correct and the error is an edit error, add the V MED file entry to the PCC.

## 5.2.2.15 Could Not Look Up Location of Encounter

## 5.2.2.16 Facility for HRN Lookup Failed

### 5.2.2.17 Chart Number Lookup Failed, Can't Find Patient

The above errors are reported when a prescription is passed from the COTS Pharmacy system and the attempt to look up the named data item failed.

The data in the HL7 message was not filed and an error message was sent to the Pharmacy system. The following action should be taken:

Make sure that the data item listed is correct. If so, add the item to the PCC. If it is incorrect, edit the Pharmacy system to use the correct data.

### 5.2.2.18 SIG Failed Input Transform

#### 5.2.2.19 Field (field name) Failed Input Transform In V MED

#### 5.2.2.20 Visit Date Failed Input Transform

#### 5.2.2.21 Service Category Failed Input Transform

The above errors are reported when a prescription is passed from the COTS Pharmacy system and the attempt to enter the named data item into the PCC failed.

The data item listed is not a valid value or format for entry into the PCC. The data in the HL7 message was not filed and an error message was sent to the Pharmacy system. The following action should be taken:

Edit the Pharmacy system to provide the data in a format acceptable to the PCC.

#### 5.2.2.2 DOB of Patient Does Not Match

#### 5.2.2.23 Sex of Patient Does Not Match

#### 5.2.2.24 SSN Does Not Match

The above errors are reported when a prescription is passed from the COTS Pharmacy system and the specified data item (Date of Birth, Sex, or SSN of the patient) as shown in the PCC does not match the corresponding data value in the message from the Pharmacy system.

The data in the HL7 message was not filed and an error message was sent to the Pharmacy system. The following action should be taken:

Verify the correct value for the data in question. Change the data in either the PCC or in the Pharmacy system so that the two match.

### 5.2.2.25 Invalid Action

This error is reported when a prescription is passed from the COTS Pharmacy system and the action code in the message is not valid.

The data in the HL7 message was not filed and an error message was sent to the Pharmacy system. The following action should be taken:

The allowable actions are Add, Delete, and Edit (codes A, D, and E). Edit the Pharmacy system to use the appropriate code based on the intent of the original message.

### 5.2.2.26 \*\* APP ACK GEN Error (number: error condition) \*\*

This error is reported when a prescription is passed from the COTS Pharmacy system and the IHS HL7 software encounters an error while trying to respond to the Pharmacy system with an acknowledgment message.

If another error is listed with this one, then the data was not filed in the PCC. If this error is the only one listed, then the data was successfully filed in the PCC. In either case, the error indicates that the IHS HL7 software was unable to notify the Pharmacy system of the result. The most likely cause is a problem with the HL7 software. The following action should be taken:

Report this error to the responsible technical support person. Further assistance is available from the IHS HL7 Help Desk (520-295-2533 or 520-295-2534), if needed.

#### 5.2.2.27 HL7 Error (number: error condition)

This error is reported when the IHS HL7 software encounters an error while trying to process or respond to a message from the Pharmacy system.

Depending on the type of error and at which point it occurred, the pharmacy data may not have been filed in the PCC. This error indicates a problem with the HL7 software. The following action should be taken:

Report this error to the responsible technical support person. Further assistance is available from the IHS HL7 Help Desk (520-295-2533 or 520-295-2534), if needed.

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## Glossary

BHL. The assigned namespace for the IHS HL7 code.

BHLBPS. The BHL code series related to processing messages from a commercial pharmacy system.

**Bulletin.** An electronic mail message automatically delivered by MailMan under certain conditions. For example, BHL generates a warning bulletin when there is a mismatch of data sent from the commercial application to the PCC. Bulletins are generated by bulletin-type cross-references.

**CHR Package.** A software program designed specifically for Community Health Representatives (CHRs) to record their activities as well as patient-related clinical data.

**Commercial Off-The-Shelf (COTS).** A software system that is available for purchase from a commercial vendor with little or no modification needed for use.

**Decentralized Hospital Computer Program (DHCP).** The Decentralized Hospital Computer Program of the Veterans Health Administration, Department of Veterans Affairs (VA). DHCP application packages, developed within the VA, are used to support clinical and administrative functions. The HL7 interface was developed for the DHCP and then modified for the Indian Health Service RPMS information system.

Error Bulletin. See Bulletin.

Fatal Error. An error in the data passed from the commercial application to the PCC that prevents the filing of the incoming information.

**Health Level Seven (HL7).** An application communications standard for the transfer of medical information between computer systems. HL7 permits data exchange between diverse computer configurations with a variety of communications protocols. Communications take place by exchange of HL7 messages.

HRN. Health record number. Each patient has a unique health record number to identify his/her medical record.

**IEN.** Internal entry number. The number used to identify an entry within a file. Every record has a unique internal entry number.

Link Error. A class of bulletins that may be issued in the event of a fatal error in a message.

Link Warning. A class of bulletins that may be issued in the event of a nonfatal error in a message.

Mail Group. A group of users within the IHS MailMan system who share a common interest.

Message. An ordered sequence of HL7 segments that conveys information from one system to another.

**Message IEN.** The internal entry number in the HL7 file where messages are stored. This number allows the lookup of the raw message data in the case of an error.

**MUMPS.** The acronym MUMPS stands for Massachusetts General Hospital Utility Multiprogramming System. The RPMS system has been created with MUMPS.

**Nonfatal Error.** An error that involves a mismatch in the data passed from the commercial application to the PCC but that does not necessarily prevent the filing of the incoming information.

Patient Care Component (PCC). The central repository for RPMS data.

**Resource and Patient Management System (RPMS).** A suite of software applications used at IHS facilities to support administrative, clerical, and clinical functions.

Rx System. Pharmacy system.

**Rx-PCC Link.** The physical and logical connection between a pharmacy system and the PCC.

**SIG.** A concise, abbreviated way to describe the administration frequency for a medication; for example: T1T QID means, "Take one tablet 4 times a day."

Warning Bulletin. See Bulletin.