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Couchbase and Socket Installation Instructions
Version 1.9
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Revision History:
1.1 Added an update section
1.2 Added a CAREWare setup section
1.3 General editing
1.4 Added new common storage settings forms, client provider lookup index, and auto add encounter. Updated screenshots
1.5 Added A08 Trigger event and replaced "Visit Units" to "Qty" in SCH process records table.
1.6 Added How to Add CAREWare service using SCH messages
1.7 Added Immunization, Medication and service updates to the import (available in from CW Build 791)
1.8 Updated Installation instructions and general editing
1.9 General editing

Before beginning the installation process, close all applications, including internet browsers. Download the Couchbase installation file from here *http://www.jprog.com/public/HL7SocketInterface.zip*. Copy the 'HL7SocketInterface' folder to the C Drive.

Couchbase Installation:

1. For a native 64 bit machines, run the *'otp_win32_R14B03.exe'* file.
2. Run the '*couchbase-single-server-enterprise_x86_64_1.1.2.setup.exe*' file to start the installation process.
3. Select defaults on all the forms and complete installation.
4. To test the Installation, Double-click on 'Couchbase Console' desktop shortcut icon which should open the Couchbase editor in a browser as shown in the image below.
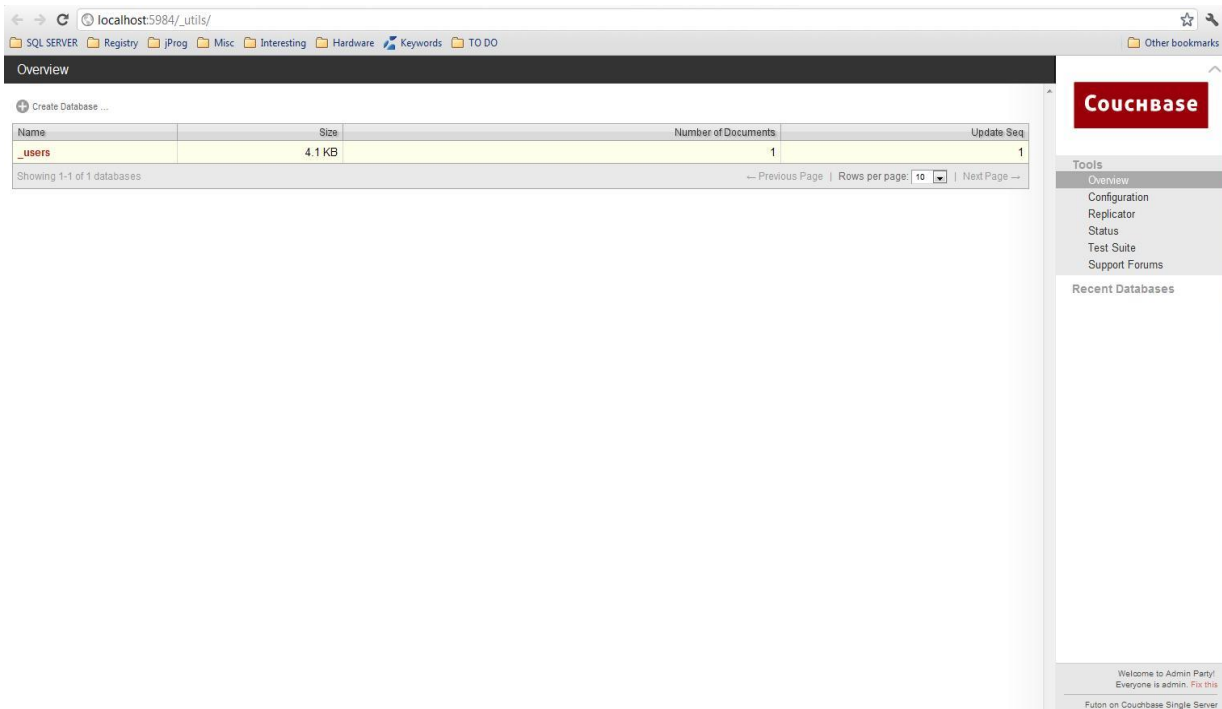
Socket Installation:

Please ensure Couchbase is listed in the Windows services and is started before you begin the socket installation process. Prior to the installation of HL7 Socket, Java Runtime environment (JRE) should be installed on the machine. If the machine already contains the JRE installed, you do not need to reinstall it again. To verify if you have JRE open the command prompt and type

Java –version
It will return the following screen if you already have JRE installed.

Otherwise, please go to https://java.com/en/download/index.jsp to download JRE, and finish installation before attempting to install Socket application.

The Installation folder contains an executable jar file for the Socket Project and a text file that contains information about establishing a connection to Couchbase from the socket project. The file *'configSocketServer.txt'* should not be deleted.

To install the Socket Project as a Windows Service:

1. Open the Command Prompt as an Administrator and Run the following commands –

   Cd C:\ HL7SocketInterface
   installservice.bat

2. This installs the Socket as a Windows Service with auto startup mode. Verify if the *SocketServer* service is listed in the Windows Services.

   The following are created in Couchbase when the *SocketServer* service is run for the first time.
   a. A database named "*cw_socket_db*" is created in Couchbase. All the HL7 files sent to Couchbase via the socket will be uploaded to the cw_socket_db database.
   b. A configuration document named "*ServerSocketConfig*" is created as a part of the above step. The Information related to the feed is maintained in this document.

3. The command to delete the service is: *prunsrv //DS/ServerSocket*
4. In order to edit this document, double-click on the field value. The value to be edited will be displayed as a JSON string in a textbox as shown in the image below. After editing, make sure to save the field first before saving the document.

CAREWare Setup

The setup steps include modifying settings in CAREWare's common storage table, turning on indexes, updating mappings, and completing the user notification and condition setup. This section provides instructions on how to complete these steps.
Note: CAREWare creates some default mappings when a user activates an index; these can be updated by the site.

Configure Common Storage

There are three ways of editing common storage: through the HL7 Feed Settings screen, through the CW Admin.exe utility, or through a SQL manager like SQL Server Management Studio. Editing in CW Admin requires a stop and restart of the RW CAREWare Business Tier service.

CW Admin.exe is located in the RW CAREWare Business Tier folder. The default location is "C:\Program Files\CAREWare\RW CAREWare Business Tier\CW Admin.exe" for 32 bit OS. It is important to upgrade to a socket compatible CAREWare build before beginning this process. The first such build was 624; it is a good idea to contact the CAREWare Help Desk and ask what build is currently recommended to use with the Socket Interface.

The steps for updating the common storage table are as follows:

1. Make sure all users are logged out of CAREWare.
2. Open CW Admin.exe.
3. On the Server Settings tab, click Stop Server. This will stop the Business Tier service.
4. Click on the Common Storage Setting tab on the upper right hand corner of the utility.
5. Look for couchdbhost, couchdbName, couchDBport, and ObservationProvider in the column cmm_st_pk.
6. By default, the cmm_st_text for couchdbhost is localhost. If couchDB and the CAREWare Business Tier are on separate servers, then set to the host name of the couchDB server.
7. By default, the cmm_st_text value for couchdbName is cw_socket_db.
8. By default, the cmm_st_text value for couchDBport is 5984.
9. Set the cmm_st_text for ObservationProvider to the primary key of the observation domain, if applicable.*
10. If you decide to use a user name and password for couchDB, those must set in couchdbUserName and couchdbPassword.
11. Click back to the Server Settings tab.
12. Click on Start Server.

CAREWare Server Settings

Server Settings | Services | Diagnostics | Database Info | Common Storage Settings

Common Storage Settings. Click on a value to edit it.

cmm_st_pk	cmm_st_text	cmm_st_date	cmm_st_number
ChangelogsAreR...			1
ChangelogTimeFi...		1/27/2009 2:33 ...	
clientMatchThres...			70
ClientURNLabel	Client URN		
CommonClientData			1
couchdbhost	localhost		
couchdbName	cw_socket_db		
couchdbPassword			
couchDBport	5984		
couchdbUserName			
cultureSettingString	en-US		
CWLabsSouceFil...	C:\Program Files\...		
DataBackupInter...			0
DataTierVersion			84.52
defaultHIVStatus	9		
DiagnosticMode			0
DOBDayDeduction			16
DOBMonthDedu...			18
DOBYearDeducti...			18
DocumentRecor...			100
EncryptFrmwrk	2.0		

When editing in SQL Management Studio, please follow these steps:

1. Log into the CAREWare database instance.
2. Expand the Databases folder.
3. Expand the CW_Data database.
4. Expand the Tables folder.
5. Find and open the table called cw_common_storage.
6. Look for couchdbhost, couchdbName, couchDBport, ObservationProvider in the column cmm_st_pk.

7. By default, the cmm_st_text for couchdbhost is localhost. If couchDB and the CAREWare Business Tier are on separate servers, then set to the host name of the couchDB server.
8. By default, the cmm_st_text value for couchdbName is cw_socket_db.
9. By default, the cmm_st_text value for couchDBport is 5984.
10. Set the cmm_st_text for ObservationProvider to the primary key of the observation domain, if applicable.*
11. If you decide to use a user name and password for couchDB, those must set in couchdbUserName and couchdbPassword.

* Observation domains allow users to add and import patient data for Ryan White "suspected" patients. They must meet specific conditions in order to be added there, and they cannot already exist in the importing domain.

Edit settings in HL7 Feed Settings

The F6: Common Storage Settings link opens the HL7 Common Storage Settings form. The form allows users to set values related to importing HL7.

Once common storage is configured, the next step is to turn on the import process indexes. There are different indexes for each message type - ADT, BAR, SCH, PWX, IMM, MDC and ORU—and the index labels begin with those message type abbreviations. Each message type has three associated indexes: Map Provider, Map Client, and Process Records. They are separated to make it easier to track down the processes.

There are two additional indexes that are shared across all HL7 message types: the HL7_Make_Document_Stubs and the System Events. Most indexes contain default field mappings, which tell CAREWare where to look in the HL7 message for certain data. To activate an index, a user logs in to the Central Administration domain, clicks on Administrative Options, and then edits the HL7 Feed Settings in the lower right-hand corner.

The F7: Advanced options screen allows users to create tasks which execute restfully on Couchbase thereby enabling data management easier for the ADT Interface. These will be useful for troubleshooting and cleanup purposes which adds to a reliable system.

HL7_Make_Document_Stubs Index

This index has three functions.

- It breaks messages with multiple MSH and PID segments into single messages. A single message consists of one MSH segment, one PID segment, and the data that pertain to that pair.
- It creates a document stub that CAREWare uses to update the import status of the message.
- It also filters out specific event triggers associated with the message types. Currently CAREWare only imports the specified trigger events below.
  - ORU : R01
  - ADT: A01, A03, A11, A34, A35, A08
  - BAR: P01, P02, P03, P04, P05, P06 (only imports diagnoses in these messages)
  - SCH: S12, S13, S14
  - RAS: O01
  - VXR or VXR : V03, V04

HL7 Field Mappings - Default - HL7_Make_Document_Stubs

Field Mappings   4 / 4

CAREWare Field	Position	Segment ID	Mapping Set	
Alternate Provider ID	4.0	MSH		
Alternate Client ID	4.0	PID		
Primary Client ID	2.0	PID		
Primary Provider ID	5.0	MSH		

F1: Add Field map
F2: Edit Field map
F3: Format Field Map

Del: Delete Field Map

Esc: Close

Results per page: 100

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CAREWare creates the four default field mappings when the HL7_Make_Document_Stubs index is activated. The four are match_ptn_id, alt_match_ptn_id, alt_provider_id, and provider_id. These fields hold the default HL7 locations for the fields used to match the CAREWare domain and patient identifying values along with their alternates. The alternates are used when no values are found in the primary location; if the alternates are blank as well, that import will fail.

Map Provider Index

This index is used to match the provider ID defined in the previous index to a domain in CAREWare. CAREWare creates a mapping record if none exists, and it deletes the messages if the mappings are

incomplete or the activation code has not been entered. If a mapping is complete and an activation code is entered for the domain, CAREWare updates the status to *Map Client*.

The Lab Test Mapping Tool's Map Provider form lists all provider mappings. The Lab Test Mapping Tool can be accessed only in the Central Administration domain, via a button on the upper right side of the Administrative Options Menu. The Map Provider records indicate whether they are active—meaning that an activation code has already been registered—or inactive. There are no field mappings for this index. The activation code is generated by jProg and is sent out upon request, usually through the CAREWare Help Desk.

ADT, SCH, BAR Map Client Index

This index processes client matching, using the matching criteria set in the provider mappings. If the ID of an incoming record matches a CAREWare client record, and if that record meets the threshold requirement, then it will be updated to *Process Records*; otherwise the HL7 message will be deleted. The field mappings for this index are:

Field	Description
State	State code
Dgn Def	Diagnosis code
Gender	Gender code
Diagnosis Type	Diagnosis type
Patient Race	Race code

ORU, IMM, PWX and MDC Map Index

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HL7 Field Mappings - Marianas Trench Care Center - MYSYS_Map_Client
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Field Mappings					3 / 3
	CAREWare Field	Position	Segment ID	Mapping Set	
F1: Add Field map	Gender	8.0	PID	cw_gender_rft	
F2: Edit Field map	Patient Race	10.0	PID	cw_client_race_rft	
F3: Format Field Map	State	11.3	PID	cw_state_rft	
Del: Delete Field Map					
Esc: Close					

Results per page: 100   << Newer   Page 1 of 1   Older >>

This index processes client matching, using the matching criteria set in the provider mappings. If the ID of an incoming record matches a CAREWare client record, and if that record meets the threshold requirement, then it will be updated to *Process Records*; otherwise the HL7 message will be deleted. The field mappings for this index are:

Field	Description
Gender	Gender code
Patient Race	Race code
State	State code

ADT Process Records Index

HL7 Field Mappings - Marianas Trench Care Center - ADT_Process_Records

Field Mappings

F1: Add Field map
F2: Edit Field map
F3: Format Field Map

Del: Delete Field Map
Esc: Close

CAREWare Field	Position	Segment ID	Mapping Set
Dgn Date	5.0	DG1	
Case Mgr(cw_client_custom-M...	18.0	PID	cw_custom_referential
mm	1.0	MRG	
Zip	11.4	PID	
Dgn Comment	17.1	PV1	
Admission Type	4.0	PV1	cw_admission_type_rft
Vital Sign Date	44.0	PV1	
City	11.2	PID	
Gender	8.0	PID	cw_gender_rft
Diagnosis Type	6.0	DG1	cw_hl7_diagnosis_type_rft
Dgn Def	3.0	DG1	cw_diagnosis_definition
Patient Race	10.0	PID	cw_client_race_rft
acct	3.0	MRG	
dischargeDate	45	PV1	
address2	11.1	PID	
Vital_Sign_Admit_Reason	3.1	PV2	
State	11.3	PID	cw_state_rft
Patient Type	18.0	PV1	cw_patient_class_rft
Patient Class	2.0	PV1	cw_patient_class_rft
Visit_ID	18.0	PID	cw_vital_signs

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This index imports hospital admissions. The field mappings for this index are listed below.

Field	Description	Note
Gender	Gender code	
Patient Race	Race code	
State	State code	
Dgn Date	Diagnosis date	
Mrn	the patient ID for patient merge events	
Zip	Client's zip code	
Dgn Comment	Diagnosis comments	
Admission Type	Admission type code	
Vital Sign Date	Hospital admission date	
Diagnosis Type	Diagnosis type code	
Dgn Def	diagnosis definition code	
Patient Race	Race code	
Acct	client account number	The previous acct# when doing a merge trigger event.
dischargeDate defines the discharge date in the HL7 message	Discharge date	
Vital_Sign_Admit_Reason	Reason for hospital admission	
Patient Type	patient type	

Patient Class	patient class	
Visit ID	the ID that is associated with the hospital admission	If a matching ID exists in a CAREWare record, the import performs an update instead of an insert.

BAR Process Records Index
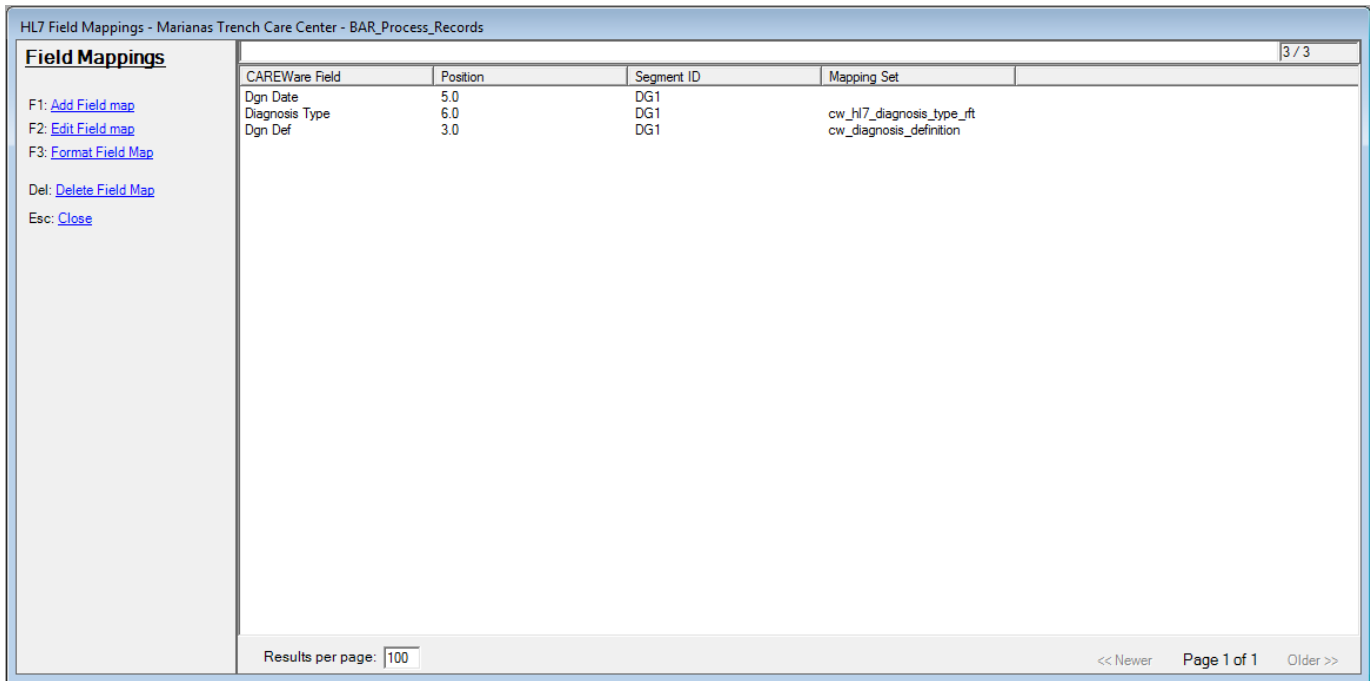
This index processes diagnosis imports.

- Dgn Def defines the diagnosis definition code in the HL7 message
- Diagnosis Type defines the diagnosis type code in the HL7 message
- Dgn Date defines where to find the diagnosis date in the HL7 message

Field	Description
Dgn Def	Diagnosis definition code
Diagnosis Type	Diagnosis type
Dgn Date	Diagnosis date

ORU Process Records Index

This index processes test data. All mappings are found in the lab test mapping tool.

SCH Process Records Index

This index imports appointments in CAREWare. It will create services from subservice mappings when a complete appointment trigger is sent and no service exists. Below are the default field mappings.

Field	Description	Note
Dgn Def	diagnosis definition code	
Diagnosis Type	diagnosis type code	
Dgn Date	diagnosis date	
Appointment Subservice	subservice code	
Filler Status Code	filler code	
Appointment Schedule ID	ID that is associated with the appointment	If a matching ID exists in a CAREWare record, the import performs an update instead of an insert.
Appointment Time	appointment time	
Qty	Service Quantity	Optional field, if added, will use value. If not added, CAREWare will use the quantity set by the contract item.

SCH Process Referral Index

The index adds referrals for certain appointments (SIU messages) for a specific doctor or location, which can be mapped as pending external referrals, and it marks the referral as completed if the client shows up for the appointment. There is also an option to create a service for the added referral.

The referrals are added, deleted or added based on the filler status code mappings.

Field	Description	Note
Dgn Def	diagnosis definition code	
Diagnosis Type	diagnosis type code	
Dgn Date	diagnosis date	
Appointment Subservice	subservice code	Used to complete the referral by adding a service
Filler Status Code	filler code	
Rfr Date	Referral date	
Srv Category	Contains service category required for adding a referral	
Referral ID	Identifier for each referral	
Referral Class	Contains information for referral class	
External provider	Used to map external provider for referral	

IMM Process Records Index

The index processes immunization data and ensures it gets imported into CAREWare. Below are the field mappings for the immunization index

Field	Description
Immunization Def	Immunization definition code
Immunization Date	Immunization date

MDC Process Records Index

The index processes medication import into CAREWare as if the incoming medications are always the patient's latest medication records. The index there does the following

- Adds any medications that are not currently used by the patient
- Stops the existing (or current before import) medications of the patient, if the incoming medications are different to the existing medications
- Updates the start and stop dates of existing medication records to reflect the most overlapping time period as a result (of combination of incoming and existing meds)

Field	Description	Note
Quantity	Used to for quantity	
Frequency	Used for medication frequency	
Start date	Used as the medication start date	
End date	Used as medication end date	
Medication definition	Used to specify the type of available medication	Has all medication definitions based on domain available for mapping
Units	Used to specify units	
Form	Used to specify medication form	
Instructions	Used to specify medication instructions	
Strength	Used to specify strength for a medication	
Indication	Specifies medication Indication	Has all indications within the domain available for mapping

Prophylaxis	Specified medication prophylaxis	Has all prophylaxis within the domain available for mapping

HL7 Field Mappings - Marianas Trench Care Center - MDC_Process_Records

Field Mappings

F1: Add Field map
F2: Edit Field map
F3: Format Field Map

Del: Delete Field Map

Esc: Close

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CAREWare Field	Position	Segment ID	Mapping Set
Units	5.0	RXE	
Strength	25.0	RXE	
Medication Name	2.1	RXE	
mdc_quantity	1.0	RXE	
Frequency	1.1	RXE	cw_frequency_rft
Form	6.0	RXE	cw_ped_medication_form
Indication	27.0	RXE	cw_indication_rft
Prophylaxis	27.1	RXE	cw_prophylaxis_rft
Stop Date	1.4	RXE	
Instructions	7.0	RXE	
Medication	2.0	RXE	cw_available_medication
Start Date	1.3	RXE	

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PWX Process Records Index

As a special case of service import, CAREWare imports services from ORU messages. The ORU HL7 messages contain information that distinguishes them from the normal ORU messages which import labs, are built with service codes in the OBX 3.1 segments. The difference between service import of PWX and SCH related indexes are as follows

- PWX index can add and edit services without creating appointment records
- PWX index cannot import any custom fields while SCH index can
- PWX index cannot delete existing services while SCH index can

Field	Description
Contract Subservice map	Has all subservice contract related information for mapping
Service Date	Service Data

HL7 Client Provider Lookup (ADT, ORU, BAR, SCH)

This index allows the process to find the CAREWare domain by looking for the client first. If a client belongs to more than one domain, the user will indicate the target domain in a custom combo box in the client custom tab. If no domain is set, the process will use the domain for which the patient has the most services. The field mappings will be the same as the client mapping index.

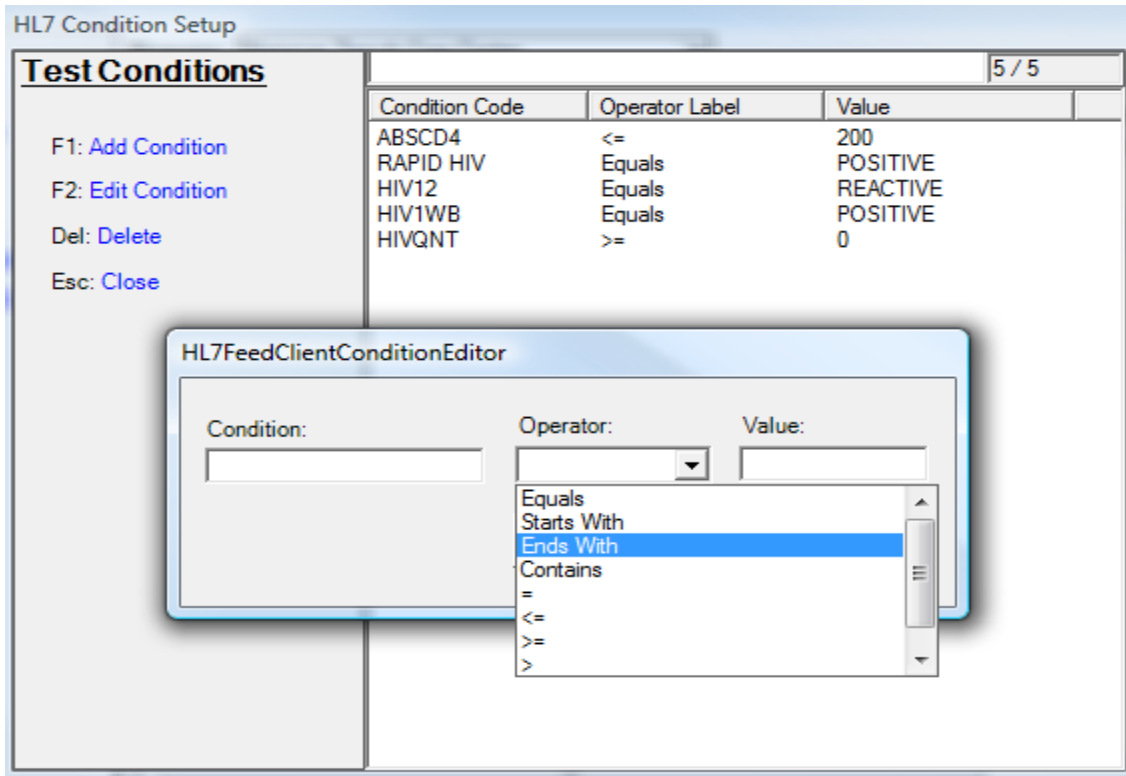| Field	Description
State	State code
Dgn Def	Diagnosis code
Gender	Gender code
Diagnosis Type	Diagnosis type
Patient Race	Race code

User Notification

This feature allows users to specify the email address to which CAREWare will send import summaries. Users can specify the time span between emails as well as the exact time to send the emails.

Test Conditions

This feature allows users to specify the test conditions that determine whether a patient is added to the observation domain when results are processed. The Condition Code is the test code sent by the lab. The Operator is the user-specified mathematical or string comparison operator. For quantitative results, it is recommended to use one of the following the mathematical operators:

- = (equals)
- < (less than)
- > (greater than)
- <= (less than or equal to)
- >= (greater than or equal to)

For qualitative test results, users can use string comparison operators such as "Equals," "Starts With," "Ends with," and "Contains."

HL7 Condition Setup

Test Conditions

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Condition Code	Operator Label	Value
ABSCD4	<=	200
RAPID HIV	Equals	POSITIVE
HIV12	Equals	REACTIVE
HIV1WB	Equals	POSITIVE
HIVQNT	>=	0

F1: Add Condition

F2: Edit Condition

Del: Delete

Esc: Close

HL7FeedClientConditionEditor

Condition:

Operator:

Value:

Equals
Starts With
Ends With
Contains
=
<=
>=
>

Diagnosis Conditions

This feature allows users to specify the diagnosis conditions that determine whether a patient is added to the observation domain when results are processed. The operator contains the string comparison operators, and the value is the ICD code that identifies the diagnosis.
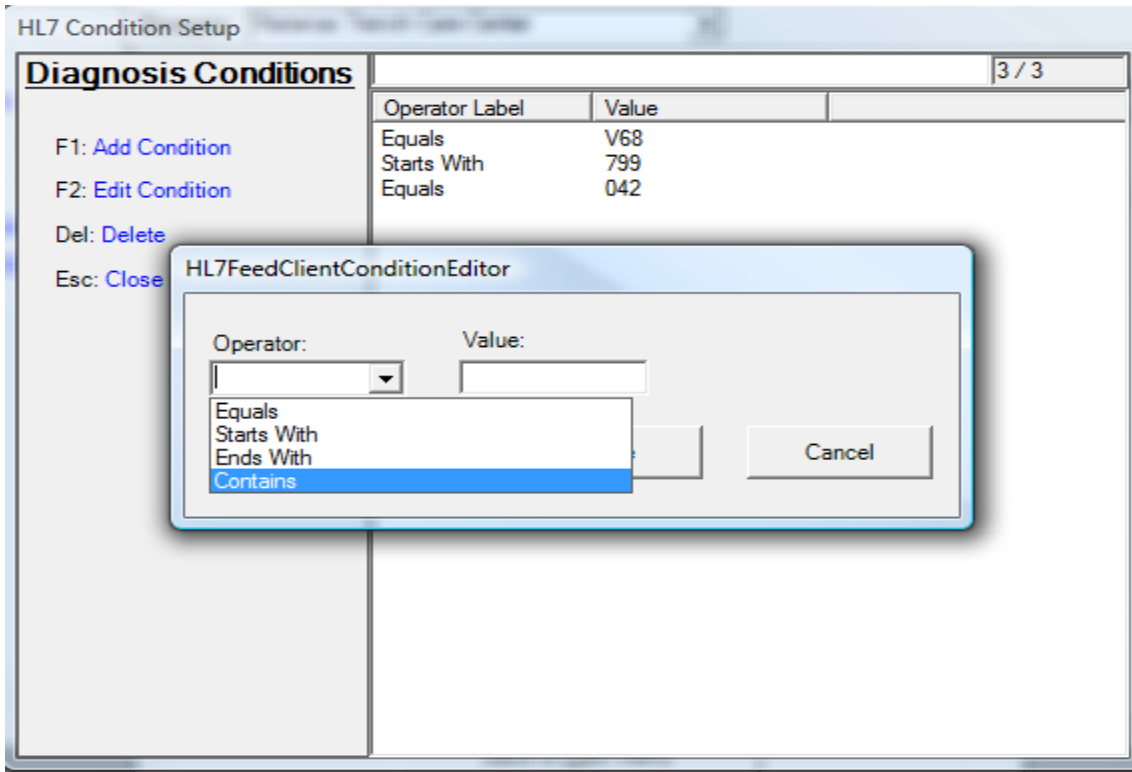
Generic Conditions

Generic conditions allow a user to specify any value from any place in the HL7 message as a condition that will trigger the addition of a patient to the observation domain. The Condition box is where the user enters the HL7 code, the Operator box allows the user to set the comparison operator, and the Value is the HL7 value. The Segment is the HL7 message segment, and the Position allows the user to specify the exact location.
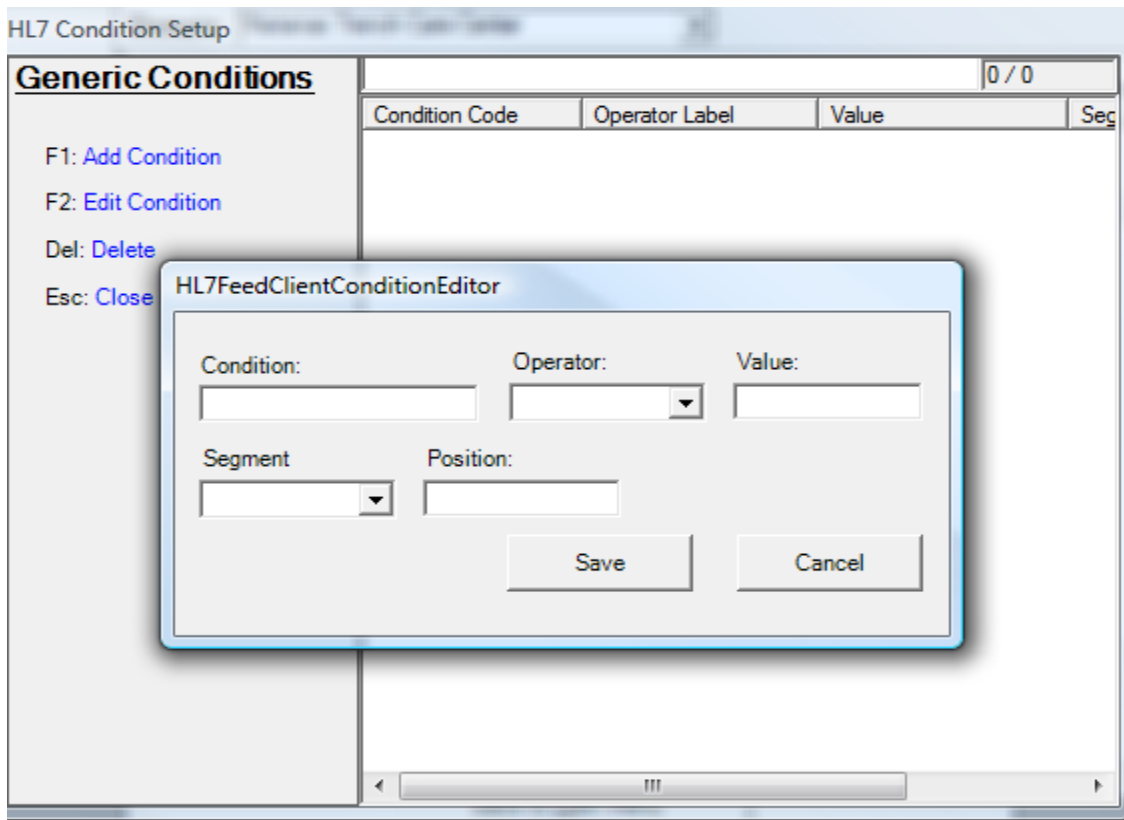
Auto Add Encounter

When this box is checked, CAREWare automatically adds an encounter date if no encounter date exists for any encounter data (tests, diagnoses, or hospital admissions) that come in. Unchecking will not remove encounter dates that were previously automatically added; it will simply not add encounter dates for existing imports.

How to Add Services Using SCH message types

CAREWare typically imports SCH message segments as appointment/scheduling data. Appointments in CAREWare can be linked to services in cases where the appointments are marked as completed. CAREWare uses filler status codes to determine an appointment type; there are several of these codes, and CAREWare groups them into three categories: Pending, Complete, and Delete.
- *Pending* appointments will add appointment records,
- *Delete* appointments will delete records, and
- *Complete* appointments will set the previous *Pending* appointment to "Met".

The value for the filler status code, by default, is located in the SCH segment at position 25, and the field mapping is labeled "Filler Status Code." Users should review and edit the mappings if necessary. When a completed appointment comes across, CAREWare systematically adds the appointment if it doesn't exist or finds it by using the appointment ID value. The appointment ID, by default, is found in the SCH segment at position 1. This value is set to allow CAREWare to know which appointment to update

if a *Pending* record was previously sent. Once the import links or adds a new appointment, it then searches for existing services that match the mapped subservice and appointment date. If it finds a match, CAREWare uses that service and links that service to the appointment. If it does not find a match, CAREWare creates a new service record referencing that subservice. If the "Qty" field mapping is not included, CAREWare uses the default quantity for that subservice. The default quantity is set when the mapped subservice is initially added to the contract. Once the service has been matched or added, CAREWare then updates the appointment to "Met."

Auto Add Clients

When this box is checked, CAREWare automatically adds a new client if the incoming HL7 message contains a patient which is not matched using the provided patient identifier. Sites need to enable this feature with caution.

Updating Field mappings

Most indexes contain default field mappings, which tell CAREWare where to look in the HL7 message for certain data elements. While some of the default field mappings are configurable by users, they need to exercise caution when changing them. We recommend users to contact the CAREWare Help Desk or the jProg implementation specialist before changing them, to ensure it will not affect the import process adversely.