

This document details how the HL7 Socket Interface imports diagnosis data into CAREWare. Diagnoses can be imported from ADT, SIU, and BAR messages. Although each message type has multiple trigger events, CAREWare only processes those specified below. The HL7 element "Message Type" is found in the MSH segment at position 9. The trigger event is a subfield of this element and is found at the first subfield, 9.1.

The following ADT messages primarily include demographic, insurance, poverty level, and hospital admission data:

- A01 (admit notification)
- A03 (discharge)
- A04 (patient registration)
- A08 (update patient information)
- A11 (cancel)
- A34 (merge patient)
- A35 (merge patient)

The following SIU event types are processed in CAREWare to import appointment, service, and referral data:

- S12 (new appointment)
- S13 (rescheduling)
- S14 (modification)

While CAREWare could import diagnoses from the above ADT and SIU message types, it is recommended to import diagnoses through BAR messages for better processing and reporting. The following message types are allowed:

- P01 (add patient account)
- P02 (purge patient account)
- P03 (post detailed financial transactions)
- P04 (generate bills and receivable statements)
- P05 (update account)
- P06 (end account)

Table 1.0: CAREWare's Diagnosis fields

CAREWare Field	Description	Comments
Diagnosis Date	Date of diagnosis	
ICD10/Diagnosis Code	Diagnosis Code	
Diagnosis Clinician	Clinician name	Optional

CAREWare Diagnosis Import

CAREWare's Socket Interface breaks down the import process into distinct steps called *Indexes*, each defined by specific functionality and an option for activation by admin users. All messages are initially processed by the *Make Stubs* index. This index parses the raw HL7 message and takes only the valid messages based on the message type and trigger event. It creates message stubs, which are representations of the HL7 message that hold the status and fields necessary for processing. The diagnosis Import process begins by activating the following indexes:

- BAR_Map_Provider
- BAR_Map_Client
- BAR_Process_Records

Upon a successful activation of these indexes, CAREWare then starts processing diagnosis stubs stored in the HL7 Socket holding tank with the status of "Map Provider."

BAR_Map_Provider Index

This index is used to assign the account provided in MSH 6 of the incoming HL7 message to a CAREWare provider. The MSH specifications can be found in table 1.1. CAREWare creates a mapping record if none exists, and if a mapping is complete and an activation code is entered for the provider, the message is moved to the Client Processing step. The Lab Test Mapping Tool's Map Provider form lists all provider mappings. The Map Provider records indicate whether they are active or inactive. Activation codes are generated and sent out by jProg upon request.

BAR_Map_Client Index

This index is used to match the HL7 message to a CAREWare patient found in the PID segment. The PID specifications can be found in table 1.2. The interface uses the Patient ID (External ID) found in the PID segment to identify patients. The provider mapping specification done in the Map Provider part of the process allows the user to specify which CAREWare field to use for matching. If the message does not contain a value for the PID element, the user can specify an alternate value using the field mapping in the *HL7_Make_Document_Stubs* index.

In addition to matching the patient based on the value, CAREWare uses a secondary check called the demographic threshold, which considers additional criteria even when the ID matches as described above. This additional check compares last name, first name, and date of birth, and the threshold set in the provider mappings determines how closely those demographic elements need to match in order for the record to be considered a match. When that threshold is not met, the message and all related stubs are marked for deletion. However, CAREWare also has a feature to automatically add new clients based on a user configurable setting.

In cases where the patient information does not match an existing CAREWare client record, the interface can still import results into an observation provider, which stores data for Ryan White-suspected patients, depending on whether diagnosis and generic condition results meet certain criteria. For diagnosis conditions, the interface checks for whether or not the patient had a particular diagnosis. For generic conditions, the user can set the interface to compare any segment element to

a user-defined value.

CAREWare also provides optional manual client matching functionality (screenshot below). Admin users can use this to review and match patient records within the provider that have been identified by the Map Provider process. Once enabled, Manual Client Matching is available across all providers importing data through the HL7 Socket Interface. An option to automatically add clients in case of a mismatch is available as well. It is recommended to use the "Auto-Add Clients" (screenshot below) with great caution because that could potentially increase the clients within the provider to unmanageable levels.

The screenshot shows the 'Interface Settings' page for the 'HL7 Socket Interface'. The breadcrumb trail is 'Administrative Options > Data Import and Export Features > HL7 Socket Interface > Interface Settings'. There are links for 'Edit', 'Fallback Conditions', 'Couchbase Settings', and 'Back'. The page is titled 'Interface Settings' and contains two main sections: 'Client Matching' and 'Auto-Purge Settings'. In the 'Client Matching' section, 'Manual Matching' is unchecked and 'Auto Add Clients' is checked. The 'Auto-Purge Settings' section is divided into 'Settings for unmatched client data only' and 'Setting for purging the entire interface data'. The first section includes fields for 'Higher Interval (Days)' (60), 'Higher Score' (30), 'Last Higher Activity' (9/25/2020 12:01:00 AM), 'Lower Interval (Days)' (30), 'Lower Score' (3), and 'Last Lower Activity' (10/20/2020 12:01:00 AM). The second section includes a field for 'Interval (months)' (12).

Administrative Options > Data Import and Export Features > HL7 Socket Interface > Interface Settings

Edit Fallback Conditions Couchbase Settings Back

Interface Settings

Client Matching

Manual Matching: ☐

Auto Add Clients: ☒

Auto-Purge Settings

Settings for unmatched client data only

Higher Interval (Days): 60

Higher Score: 30

Last Higher Activity: 9/25/2020 12:01:00 AM

Lower Interval (Days): 30

Lower Score: 3

Last Lower Activity: 10/20/2020 12:01:00 AM

Setting for purging the entire interface data

Interval (months): 12

HL7_Client_Provider_Look_Up_BAR Index

CAREWare also provides an option to match providers and clients in one step using client-provider lookup indexes. When using lookup indexes, it is advised not to operate with other Map Provider/Map Client indexes activated to avoid inconsistent provider and client matching functionality. The lookup indexes search for patients across all CAREWare providers and set the provider and client values based on the setup. The following cases are possible:

- No client/provider combination is found: CAREWare automatically adds the client record to a provider according to conditions set on the Fallback Conditions screen (screenshot below).
- A single client/provider record is found: if the client threshold is met, the client is assigned to the provider; otherwise the fallback provider settings are used.
- Several clients in a provider are identified: CAREWare flags the importing client as "Duplicate"

and waits for user resolution.

- A single client is found in several providers: values entered for the client custom field for import provider are used for the import; if these are not found, the

Primary Provider calculation used in CAREWare's Custom Report module is used.

Segment	Position	FeedPK	Values
MSH	5	ADT	CAREWare, CWare

BAR_Process_Records Index

This document focuses on the BAR_Process_Records index. This Index is used to import diagnoses into CAREWare. Each message type imports different data into CAREWare. There are checks to make sure that all required data elements needed for particular imports are mapped prior to allowing the import to proceed. Before importing a diagnosis, CAREWare must know four required elements: the provider, the patient, the diagnosis, and the diagnosis date.

Table 1.1: MSH Specifications

SEQ	LEN	OPT	ELEMENT NAME	CAREWare Field	Required For Import	Comments
1	1	R	Field Separator		Yes	Indicates what delimiter to use to separate components when parsing.
2	4	R	Encoding Characters		Yes	
3	180	O	Sending Application		Yes	Used in conjunction with MSH 6 to ensure a unique provider mapping record. CAREWare uses this value to determine where the data

						originated from.
4	180	O	Sending Facility		No	Available as an alternative to MSH 3.
5	180	O	Receiving Application	Alternate Provider ID	Yes	Available as an alternative to MSH 6. If user sets this as the default provider identifier, this value will override the value MSH 6. If this is set as the alternate value, it will override MSH 6 if MSH 6 is empty.
6	180	O	Receiving Facility	Primary Provider ID	No	Used in conjunction with MSH 3 to create a unique provider mapping record. CAREWare uses this value to link to a CAREWare provider. jProg needs this value to create an activation code.
7	26	O	Date/Time Of Message		No	
8	40	O	Security		No	
9	7	R	Message Type		Yes	CAREWare uses this field to determine the message type and trigger event. Message type is in MSH 9.0 and trigger event is in MSH 9.1.
10	20	R	Message Control ID		No	
11	3	R	Processing ID		No	
12	8	R	Version ID		No	
13	15	O	Sequence Number		No	
14	180	O	Continuation Pointer		No	
15	2	O	Accept Acknowledgment Type		No	
16	2	O	Application Acknowledgment Type		No	
17	2	O	Country Code		No	
18	6	O	Character Set		No	
19	60	O	Principal Language Of		No	

			Message			
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Table 1.2: PID Specifications

SEQ	LEN	OPT	ELEMENT NAME	CAREWare Field	Required For Import	Comments
1	4	O	Set ID - Patient ID		No	
2	20	O	Patient ID (External ID)	Primary Client ID	Yes	Default field where CAREWare looks for matching patient value.
3	20	R	Patient ID (Internal ID)	Primary/Alternate Client ID	No	Can be used as matching patient identifier. If user sets this as the default patient identifier, this value will override the value PID 2. If this is set as the alternate value, it will override PID 2 if PID 2 is empty.
4	20	O	Alternate Patient ID - PID	Primary/Alternate Client ID	No	Can be used as matching patient identifier. If user sets this as the default patient identifier, this value will override the value in PID 2. If this is set as the alternate value, it will override PID 2 if PID 2 is empty.
5	48	R	Patient Name	Last Name, First Name, Middle Name	No	If patient name is not set, CAREWare will match patients by matching patient value only. Users must set CAREWare's threshold (secondary check) to 0.
6	48	O	Mother's Maiden Name		No	
7	26	O	Date/Time of Birth		No	If date of birth is not set, make sure CAREWare's threshold (secondary check) is low enough to account for this. YYYY.
8	1	O	Sex	Sex at Birth	No	Only mandatory if new patient is added.
9	48	O	Patient Alias		No	
10	1	O	Race	Patient Race,	No	Single patient race

				Race Subgroup		
11	106	O	Patient Address	Address, Address Continued, City, State, Zip	No	Address^Address Continued^City^State^Zip
12	4	B	County Code	County	No	
13	40	O	Phone Number - Home	Phone	No	
14	40	O	Phone Number - Business		No	
15	60	O	Primary Language		No	
16	1	O	Marital Status		No	
17	3	O	Religion		No	
18	20	O	Patient Account Number	acct	No	
19	16	O	SSN Number - Patient		No	
20	25	O	Driver's License Number - Patient		No	
21	20	O	Mother's Identifier		No	
22	3	O	Ethnic Group	Hispanic	No	
23	60	O	Birth Place		No	
24	2	O	Multiple Birth Indicator		No	
25	2	O	Birth Order		No	
26	4	O	Citizenship		No	
27	60	O	Veterans Military Status		No	
28	80	O	Nationality		No	
29	26	O	Patient Death Date and Time	deathDate	No	
30	1	O	Patient Death Indicator	Vtl Status	No	

Any fields not defined here can be imported if set to other segments. If they are set to other segments, those segments must exist in the HL7 message in order to be imported. If the fields are set and the segments do not exist, CAREWare will error out, stating that it is trying to get data from a segment that does not exist in the message.

Table 1.3: DG1 Specifications

SEQ	LEN	OPT	ELEMENT NAME	CAREWare Field	Required for Import	Comments
1	4	R	Set ID - DG1			
2	2	(B) R	Diagnosis Coding Method			
3	60	O	Diagnosis Code	Diagnosis Code (ICD10 code)	Yes	
4	40	B	Diagnosis Description			
5	26	O	Diagnosis Date/Time	Diagnosis date	Yes	
6	2	R	Diagnosis Type		Yes	
7	60	B	Major Diagnostic Category			
8	4	B	Diagnostic Related Group			
9	2	B	DRG Approval Indicator			
10	2	B	DRG Grouper Review Code			
11	60	B	Outlier Type			
12	3	B	Outlier Days			
13	12	B	Outlier Cost			
14	4	B	Grouper Version And Type			
15	2	B	Diagnosis Priority			
16	60	O	Diagnosing Clinician	Comment	No	CW saves the doctor's name in comments.
17	3	O	Diagnosis Classification			
18	1	O	Confidential Indicator			
19	26	O	Attestation Date/Time			

Sample Update Patient Info Message (Minimum)

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MSH|^~\&|SENDAPP|||PROVIDERID|||BAR^P01
PID|1|123456||BAR^TESTER||20010101|F
DG1|1|ICD-10-CM|R51|HA
(headache)|20171022230000|F|||||||123456789^Test^Residen t
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