



# BEA WebLogic Adapter for HL7<sup>®</sup>

## User Guide

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# About This Document

This document describes how to install, configure, and use the BEA WebLogic Adapter for HL7. This document is organized as follows:

- [Chapter 1, “Introducing the BEA WebLogic Adapter for HL7,”](#) describes the adapter, and how it relates to both HL7 business objects and WebLogic Integration.
- [Chapter 2, “Generating Schemas for HL7 Documents,”](#) describes how to generate schemas for your HL7 business objects.
- [Chapter 3, “Defining Application Views for HL7,”](#) describes how to use application views to configure events and services.
- [Chapter 4, “Writing and Editing Rule Specification Files,”](#) describes how to write rule specification files for validation.
- [Appendix A, “HL7 Document Index,”](#) describes the HL7 documents that are supported by the adapter.

## Who Should Read This Documentation

This document is intended for the following members of an integration team:

- **Integration Specialists**—Lead the integration design effort. Integration specialists have expertise in defining the business and technical requirements of integration projects, and in designing integration solutions that implement specific features of WebLogic Integration. The skills of integration specialists include business and technical analysis, architecture design, project management, and WebLogic Integration product knowledge.

- **Technical Analysts**—Provide expertise in an organization’s information technology infrastructure, including telecommunications, operating systems, applications, data repositories, future technologies, and IT organizations. The skills of technical analysts include technical analysis, application design, and information systems knowledge.
- **Enterprise Information System (EIS) Specialists**—Provide domain expertise in the systems that are being integrated using WebLogic Integration adapters. The skills of EIS specialists include technical analysis and application integration design.
- **System Administrators**—Provide in-depth technical and operational knowledge about databases and applications deployed in an organization. The skills of system administrators include capacity and load analysis, performance analysis and tuning, deployment topologies, and support planning.

## Additional Information

To learn more about the software components associated with the adapter, see the following documents:

- *BEA WebLogic Adapter for HL7 Release Notes*  
<http://edocs.bea.com/wl.adapters/hl7/docs812/pdf/relnotes.pdf>
- *BEA WebLogic Adapter for HL7 Installation and Configuration Guide*  
<http://edocs.bea.com/wl.adapters/hl7/docs812/pdf/install.pdf>
- *Introduction to the BEA WebLogic Adapters*  
<http://edocs.bea.com/wl.adapters/docs81/pdf/intro.pdf>
- BEA WebLogic Adapters Dev2Dev Product Documentation  
<http://dev2dev.bea.com/products/wl.adapters/index.jsp>
- Application Integration documentation  
<http://edocs.bea.com/wli/docs81/aiover/index.html>  
<http://edocs.bea.com/wli/docs81/aiuser/index.html>
- BEA WebLogic Integration documentation  
<http://edocs.bea.com/wli/docs81/index.html>
- BEA WebLogic Platform documentation  
<http://edocs.bea.com/platform/docs81/index.html>



- HL7 documentation

<http://www.hl7.org>

## How to Use This Document

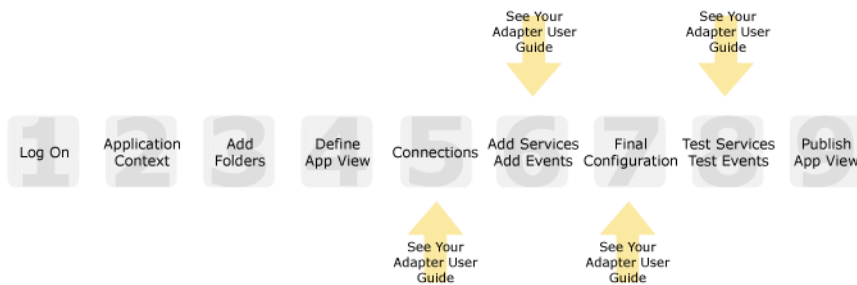
This document is designed to be used in conjunction with *Using the Application Integration Design Console*, available at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

*Using the Application Integration Design Console* describes, in detail, the process of defining an application view, which is a key part of making an adapter available to process designers and other users. What *Using the Application Integration Design Console* does *not* cover is the specific information about the Adapter for HL7 that you need to supply to complete the application view definition. You will find that information in this document.

At each point in *Using the Application Integration Design Console* where you need to refer to this document, you will see a note that directs you to a section in your adapter user guide, with a link to the edocs page for adapters. The following roadmap illustration shows where you need to refer from *Using the Application Integration Design Console* to this document.

**Figure 1 Information Interlock with *Using the Application Integration Design Console***



## Contact Us!

Your feedback on the BEA WebLogic Adapter for HL7 documentation is important to us. Send us e-mail at [docsupport@bea.com](mailto:docsupport@bea.com) if you have questions or comments. Your comments will be reviewed directly by the BEA professionals who create and update the BEA WebLogic Adapter for HL7 documentation.

In your e-mail message, please indicate that you are using the documentation for BEA WebLogic Adapter for HL7 and the version of the documentation.

If you have any questions about this version of BEA WebLogic Adapter for HL7, or if you have problems using the BEA WebLogic Adapter for HL7, contact BEA Customer Support through BEA WebSUPPORT at **www.bea.com**. You can also contact Customer Support by using the contact information provided on the Customer Support Card which is included in the product package.

When contacting Customer Support, be prepared to provide the following information:

- Your name, e-mail address, phone number, and fax number
- Your company name and company address
- Your machine type
- The name and version of the product you are using
- A description of the problem and the content of pertinent error messages

# Documentation Conventions

The following documentation conventions are used throughout this document.

Convention	Item
<b>boldface text</b>	Indicates terms defined in the glossary.
Ctrl+Tab	Indicates that you must press two or more keys simultaneously.
<i>italics</i>	Indicates emphasis or book titles.
monospace text	Indicates code samples, commands and their options, data structures and their members, data types, directories, and file names and their extensions. Monospace text also indicates text that you must enter from the keyboard. <i>Examples:</i> <pre>#include &lt;iostream.h&gt; void main ( ) the pointer psz chmod u+w * \tux\data\ap .doc tux.doc BITMAP float</pre>
<b>monospace boldface text</b>	Identifies significant words in code. <i>Example:</i> <pre>void <b>commit</b> ( )</pre>
<i>monospace italic text</i>	Identifies variables in code. <i>Example:</i> <pre>String <i>expr</i></pre>
UPPERCASE TEXT	Indicates device names, environment variables, and logical operators. <i>Examples:</i> <pre>LPT1 SIGNON OR</pre>
{ }	Indicates a set of choices in a syntax line. The braces themselves should never be typed.

Convention	Item
[ ]	<p>Indicates optional items in a syntax line. The brackets themselves should never be typed.</p> <p><i>Example:</i></p> <pre>buildobjclient [-v] [-o name ] [-f file-list]... [-l file-list]...</pre>
	<p>Separates mutually exclusive choices in a syntax line. The symbol itself should never be typed.</p>
...	<p>Indicates one of the following in a command line:</p> <ul style="list-style-type: none"> <li>• That an argument can be repeated several times in a command line</li> <li>• That the statement omits additional optional arguments</li> <li>• That you can enter additional parameters, values, or other information</li> </ul> <p>The ellipsis itself should never be typed.</p> <p><i>Example:</i></p> <pre>buildobjclient [-v] [-o name ] [-f file-list]... [-l file-list]...</pre>
.	<p>Indicates the omission of items from a code example or from a syntax line. The vertical ellipsis itself should never be typed.</p>

# Introducing the BEA WebLogic Adapter for HL7

This section introduces the BEA WebLogic Adapter for HL7 and describes how the adapter enables integration with HL7 documents and WebLogic Integration.

It includes the following topics:

- [About the BEA WebLogic Adapter for HL7](#)
- [Getting Started With the Adapter for HL7](#)

## About the BEA WebLogic Adapter for HL7

HL7 (Health Level Seven) was founded in 1987 to develop standards for electronic interchange for clinical, financial, and administrative information. The standards were developed for electronic interchange between independent healthcare-oriented computer systems such as hospital information systems, clinical laboratory systems, enterprise systems, and pharmacy systems.

The BEA WebLogic Adapter for HL7 connects to your HL7 system so that you can easily use your HL7 data within your business processes. The adapter provides scalable, reliable, and secure access to your HL7 system.

This section includes the following topics:

- [Supported HL7 Operations for Application Integration](#)
- [Supported HL7 Documents](#)
- [Supported Services](#)

- [Supported Events](#)
- [Benefits of the Adapter for HL7](#)

## Supported HL7 Operations for Application Integration

The Adapter for HL7 supports synchronous and asynchronous, bi-directional message interactions for HL7 documents.

It provides integration with the following HL7 operations:

- Access to HL7 documents using XML to handle both services and events
- The Adapter for HL7 defines transactions for transmitting data about:
  - Patient registration, admission, discharge, and transfers
  - Patient insurance, charges, and payers
  - Laboratory orders and test results
  - Image studies
  - Nursing and physician observations
  - Diet, pharmacy, and supply orders
  - Master files
  - Appointment scheduling
  - Problem lists
  - Clinical trial enrollments
  - Patient permissions
  - Voice dictations, advanced directives, and physiologic signals

## Supported HL7 Documents

The adapter provides pre-packaged support for HL7 standard documents. The adapter does not provide out-of-the-box support for customizing these formats. Contact BEA professional services if you need to customize these formats.

The adapter also includes sample files for each of the supported HL7 versions.

## Supported Services

The Adapter for HL7 supports five types of services, one for each type of transport supported by the adapter: MQSeries, File, HTTP, FTP, and TCP. In each case, the adapter sends a file to your HL7 system.

These are the services supported by Adapter for HL7:

- MQ service, which sends a file to an IBM MQSeries or WebSphere MQ queue.
- File service, which writes a file to a specific directory on disk.
- HTTP service, which sends a file through HTTP.
- FTP service, which sends a file through FTP.
- TCP service, which sends a file through TCP.

## Supported Events

The Adapter for HL7 supports five types of events, one for each type of transport supported by the adapter: MQSeries, File, HTTP, FTP, and TCP. In each case, the adapter picks up a file and passes it to the WebLogic Integration system.

These are the events supported by Adapter for HL7.

- MQ event, in which the adapter picks up a file from a specific IBM MQSeries or WebSphere MQ queue.
- File event, in which the adapter picks up a file from a specific directory on disk.
- HTTP event, in which the adapter picks up a file transmitted through HTTP.
- FTP event, in which the adapter picks up a file from a FTP server.
- TCP event, in which the adapter picks up a file transmitted through TCP.

## Benefits of the Adapter for HL7

The combination of the adapter and WebLogic Integration supplies everything you need to integrate your workflows and enterprise applications with your HL7 system. The Adapter for HL7 provides these benefits:

- Integration can be achieved without custom coding.

- Business processes can be started by events generated by your HL7 system.
- Business processes can request and receive data from your HL7 system using services.
- Adapter events and services are standards-based. The adapter services and events provide extensions to the *J2EE Connector Architecture* (JCA) version 1.0 from Sun Microsystems, Inc. For more information, see the Sun JCA page at the following URL:

<http://java.sun.com/j2ee/connector/>

- The adapter and WebLogic Integration solution is scalable. The BEA WebLogic Platform provides clustering, load balancing, and resource pooling for a scalable solution. For more information about scalability, see the following URL:

<http://edocs.bea.com/wls/docs81/cluster/index.html>

- The adapter and WebLogic Integration solution benefits from the fault-tolerant features of the BEA WebLogic Platform. For more information about high availability, see the following URL:

<http://edocs.bea.com/wli/docs81/deploy/index.html>

- The adapter and WebLogic Integration solution is secure, using the security features of the BEA WebLogic Platform and the security of your HL7 system. For more information about security, see the following URL:

<http://edocs.bea.com/wls/docs81/secintro/index.html>

## Getting Started With the Adapter for HL7

This section gives an overview of how to get started using the BEA WebLogic Adapter for HL7 within the context of an application integration solution. Integration with HL7 involves the following tasks:

- [Step 1: Design the Application Integration Solution](#)
- [Step 2: Determine the Required HL7 Business Workflows](#)
- [Step 3: Generate Schemas for HL7 Documents](#)
- [Step 4: Define Application Views and Configure Services and Events](#)
- [Step 5: Integrate Your HL7 System With Other BEA Software Components](#)
- [Step 6: Deploy the Solution to the Production Environment](#)



## Step 1: Design the Application Integration Solution

The first step is to design an application integration solution, which includes (but is not limited to) such tasks as:

- Defining the overall scope of application integration.
- Determining the business process(es) to integrate.
- Determining which WebLogic Platform components will be involved in the integration, such as web services or workflows designed in WebLogic Workshop, portals created in WebLogic Portal, and so on.
- Determining which external systems and technologies will be involved in the integration, such as HL7 systems and other EISs.
- Determining which BEA WebLogic Adapters will be required, such as the BEA WebLogic Adapter for HL7. An application integration solution can involve multiple adapters.

This step involves the expertise of business analysts, system integrators, and EIS specialists (including HL7 specialists). Note that an application integration solution can be part of a larger integration solution.

## Step 2: Determine the Required HL7 Business Workflows

Within the larger context of an application integration project, you must determine which specific HL7 documents are required for services and events to support the business processes in the application integration solution.

Factors to consider include (but are not limited to):

- Type of HL7 documents and transport used to access the HL7 system.
- HL7 transactions involved in business processes
- Logins required to access transports supported by your HL7 system and perform the required operations
- Whether operations are, from the adapter point of view:
  - services, which notify the HL7 system with a request for action, and, in addition, whether such services should be processed synchronously or asynchronously
  - events, which are notifications from the HL7 system that trigger workflows

This step involves the expertise of HL7 specialists, including analysts and administrators.

## Step 3: Generate Schemas for HL7 Documents

After identifying the HL7 documents required for the application integration solution, you must generate the XML schemas that will be used to exchange data with one or more HL7 systems:

- Services require two XML schemas: one for the HL7 system request and another for the HL7 system response.
- Events require a single XML schema to handle the data sent by the HL7 system.

To learn more about schemas, see [Chapter 2, “Generating Schemas for HL7 Documents.”](#)

## Step 4: Define Application Views and Configure Services and Events

After you create the schemas for your HL7 system services and events, you create an application view that provides an XML-based interface between WebLogic Server and a particular HL7 system within your enterprise. If you are accessing multiple HL7 systems, you define a separate application view for each HL7 system you want to access. To provide different levels of security access (such as “guest” and “administrator”), define a separate application view for each security level.

Once you define an application view, you can configure events and services in that application view that employ the XML schemas that you created in [“Step 3: Generate Schemas for HL7 Documents”](#) on page 1-6. To learn more about generating schemas, see [Chapter 2, “Generating Schemas for HL7 Documents.”](#)

To learn more about defining application views, see [Chapter 3, “Defining Application Views for HL7”](#) in conjunction with *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

## Step 5: Integrate Your HL7 System With Other BEA Software Components

Once you have configured and published one or more application views for integration with your HL7 system, you can integrate these application views into other BEA software components, such as workflows or Web services created in BEA WebLogic Workshop, or portals built with BEA WebLogic Portal.

For more information, see *Using the Application Integration Design Console*, particularly Chapter 3, “Using Application Views with Application Workflows,” at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

## Step 6: Deploy the Solution to the Production Environment

After you have designed, built, and tested your application integration solution, you can deploy it into a production environment. The following list describes some of the tasks involved in deploying an application integration:

- Design the deployment.
- Deploy the required components of the BEA WebLogic Platform.
- Install and deploy the BEA WebLogic Adapter for HL7 as described in *BEA WebLogic Adapter for HL7 Installation and Configuration Guide*
- Deploy your application views and schemas for integration with your HL7 system.
- Verify business processes in the production environment.
- Monitor and tune the deployment.



# Generating Schemas for HL7 Documents

The Adapter for HL7 uses XML documents to communicate with your HL7 system's integration objects for both services and events. The format of these documents is described by schemas.

The adapter generates schemas for you in the application view definition process. All you must specify is a location for these schemas, called a schema repository. This section describes the schemas and other structures the adapter generates when you define application views. It contains the following topics:

- [About Schemas](#)
- [About Validating HL7 Messages](#)
- [About Schema Repositories](#)
- [Next Steps](#)

## About Schemas

Each service or event the Adapter for HL7 uses is defined by a schema. All of the documents the adapter sends to, or receives from the EIS must be defined by schemas. These schemas are used as part of the message validation process. To learn more about message validation, see [“About Validating HL7 Messages” on page 2-2](#). The adapter uses the following schemas:

- [Service Requests](#)
- [Service Responses](#)
- [Events](#)

## Service Requests

*Service requests* are requests for action that your application makes to your HL7 system. Requests are defined by request schema. As part of the definition, the request schema defines the input parameters required by the HL7 system. The HL7 system responds to the request with a service response.

## Service Responses

*Service responses* are the way the HL7 system responds to a service request. A service response schema defines this service response. Service requests always have corresponding responses.

## Events

*Events* are generated by the HL7 system as a result of activity on that system. You can use these events to trigger an action in your application. For example, the HL7 system may generate an event when customer information is updated. If your application must do something when this happens, your application is a consumer of this event. Events are defined by event schema.

## About Validating HL7 Messages

HL7 messages are validated in two ways. First, the structure of the message is checked to make sure it conforms to the schema for its message type. Second, the content of the file is validated by the rules engine. The rules engine uses a rules file that contains pre-configured rules for the elements of the HL7 message. You can customize these rules, and you can also write your own rules to apply your own business logic.

## About Rules Files

After the document has been converted from the HL7 EDI format into XML, using the schema, the adapter uses the rules files to validate the contents of the document. The rules files are pre-built to apply the HL7-mandated rules. Rules are associated with the converted document by the document's root tag. The BEA WebLogic Adapter for HL7 is pre-configured to apply these rules to the document. To learn more about these documents, see [Chapter 4, "Writing and Editing Rule Specification Files."](#)

## About EDI to XML Transformation

The BEA WebLogic Adapter for HL7 automatically transforms HL7 EDI documents to XML and vice versa. You can use workflows to develop transformations from non-XML format to the HIPAA-mandated EDI format. In addition, you can use a business process workflow to build templates of business processes to convert to application-specific XML or EDI form."

## About Schema Repositories

The schema repository stores schema information. This section contains the following topics:

- [About the Contents of the Schema Repository](#)
- [About the Repository Manifest](#)

## About the Contents of the Schema Repository

The adapter automatically generates repository directories and components.

A schema repository consists of the following elements:

- Manifest file (`manifest.xml`) that describes the event and service schemas contained in the repository.
- Event and service schemas. The schemas are usually stored in files with an `.xsd` extension.
- HL7 document dictionaries. HL7 documents are described by dictionary files. For events, the adapter converts HL7 documents into XML on entry and, for services, converts from XML to HL7 on exit.
- Rules files. These rules files initiate the validation process by applying rules to the data.
- Code sets. These are files that are used to do some checking of the data values.
- Sample files. For each supported version of HL7, there is one sample file.

When you use the WebLogic Integration Application View Console to create an Application View, a schema repository is automatically created for you. In addition, the Application View creation process also creates a repository manifest and extracts the schemas into the repository.

## About the Repository Manifest

Each schema repository has a manifest that describes the repository and its contents. The repository manifest is an XML file named `manifest.xml`. This file is created automatically when the repository is generated. The root directory for the repository is based on your version of HL7 (version 2.3, 2.31, or 2.4).

The following is an example of a manifest file showing the relationships between events and schemas and service request and response schemas.

### Listing 2-1 Sample Repository Manifest (Portion Only)

---

```
</manifest>
  <connection/>
  <schemaref name="HL7_SCHEMA">
    <request root="HL7" file="oru_r01_v23.xsd" />
    <response root="HL7" file="oru_r01_v23.xsd" />
    <event root="HL7" file="oru_r01_v23.xsd" />
  </schemaref>
</manifest>
```

The repository has a connection section, which can be ignored for this adapter. It also has a schema reference section, named `schemaref`. The schema reference name appears in the drop-down list on the Add Service or Add Event screens in the WebLogic Integration Application View Console. Each named schema reference can contain three schemas, one of each type.

## Next Steps

After you have defined schemas for your events and services, the next step is to create an application view. An application view makes the services and events available to applications. To learn more about application views, see [Defining Application Views for HL7](#).



# Defining Application Views for HL7

An application view is a business-oriented interface to objects and operations within an EIS.

This section presents the following topics:

- [How to Use This Document](#)
- [Before You Begin](#)
- [About Application Views](#)
- [About Defining Application Views](#)
- [Defining Service Connection Parameters](#)
- [Setting Service Properties](#)
- [Setting Event Properties](#)
- [Defining Event Connection Parameters](#)
- [Testing Services](#)
- [Testing Events Using a Service](#)
- [Testing Events Manually](#)

## How to Use This Document

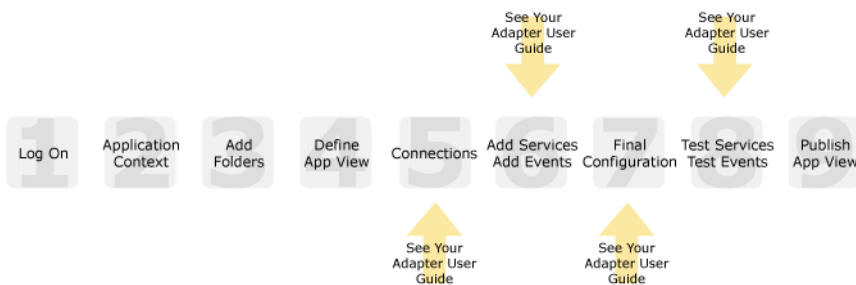
This document is designed to be used in conjunction with *Using the Application Integration Design Console*, available at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

*Using the Application Integration Design Console* describes, in detail, the process of defining an application view, which is a key part of making an adapter available to process designers and other users. What *Using the Application Integration Design Console* does *not* cover is the specific information—about connections to your HL7 system, as well as supported services and events—that you must supply as part of the application view definition. You will find that information in this section.

At each point in *Using the Application Integration Design Console* where you need to refer to this document, you will see a note that directs you to a section in your adapter user guide, with a link to the edocs page for adapters. The following road map illustration shows where you need to refer from *Using the Application Integration Design Console* to this document.

**Figure 3-1 Information Interlock with *Using the Application Integration Design Console***



## Before You Begin

Before you define an application view, make sure you have:

- Installed and deployed the adapter according to the instructions in *BEA WebLogic Adapter for HL7 Installation and Configuration Guide*.
- Determined which business processes need to be supported by the application view. The required business processes determine the types of services and events you include in your application views. Therefore, you must gather information about the application's business requirements from the business analyst. Once you determine the necessary business

processes, you can define and test the appropriate services and events. For more information, see [“Getting Started With the Adapter for HL7” on page 1-4](#).

- Gathered the connection information for your HL7 system. To learn more about this information, see your HL7 system administrator.

## About Application Views

An application view defines:

- Connection information for the EIS, including login information, connection settings, and so on.
- Service invocations, including the information the EIS requires for this request, as well as the request and response schemas associated with the service.
- Event notifications, including the information the EIS publishes and the event schema for inbound messages.

Typically, an application view is configured for a single business purpose and contains only the services and events required for that purpose. An EIS might have multiple application views, each defined for a different purpose.

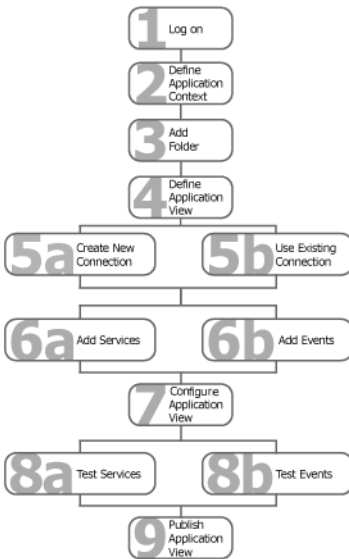
## About Defining Application Views

Defining an application view is a multi-step process described in *Using the Application Integration Design Console*, available at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

The information you enter depends on the requirements of your business process and your EIS system configuration. [Figure 3-2](#) summarizes the procedure for defining and configuring an application view.

**Figure 3-2 Process for Defining and Configuring an Application View**



To define an application view:

1. Log on to the WebLogic Integration Application View Console.
2. Define the application context by selecting an existing application or specifying a new application name and root directory.

This application will be using the events and services you define in your application view. The application view works within the context of this application.
3. Add folders as required to help you organize application views.
4. Define a new application view for your adapter.
5. Add a new connection service or select an existing one.

If you are adding a new connection service, see [“Defining Service Connection Parameters” on page 3-5](#) for details about HL7 requirements.
6. Add the events and services for this application view.

See the following sections for details about HL7 requirements:

  - [“Setting Service Properties” on page 3-6](#)

- “Setting Event Properties” on page 3-15
7. Perform final configuration tasks.
 

If you are adding an event connection, see “Defining Event Connection Parameters” on page 3-23 for details about HL7 requirements.
  8. Test all services and events to make sure they can properly interact with the target HL7 system.
 

See the following sections for details about HL7 requirements:

    - “Testing Services” on page 3-25
    - “Testing Events Using a Service” on page 3-26
    - “Testing Events Manually” on page 3-27
  9. Publish the application view to the target WebLogic Workshop application.
 

This is the application you specified in step 2. Publishing the application view allows workflow developers within the target application to interact with the newly published application view using an Application View control.

## Defining Service Connection Parameters



This information applies to “Step 5A, Create a New Browsing Connection” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

The Select Browsing Connection page allows you to choose the type of connection factory to associate with the application view. You can select a connection factory within an existing instance of the adapter or create a connection factory within a new adapter instance.

Adapter Instance:

[Create New...](#)

Click to create a new connection factory

Existing Adapter Instances:

Adapter Name	Operations	Description
Existing connection factories will be here.		

Existing connection factories will be here.

[Back](#)

After you enter a connection name and description, you use the Configure Connection Parameters page to specify connection parameters for a connection factory.

To create a new browsing connection:

1. In the Create New Browsing Connections page, enter a connection name and description as described in *Using the Application Integration Design Console*.

The Configure Connection Parameters page appears to allow you to configure the newly created connection factory within the new adapter instance.

*On this page, you supply parameters to connect to your EIS*

The BEA Application Explorer generates schema information for a session stored at a location that must be known to the general adapter. Enter this session location here. A session can support multiple connections.

Once you have entered the **session path** location, click on the pulldown arrow for the **connection name**, which will display a selection list of valid connections.

Session Path*	<input type="text" value="D:\Program Files\BEA Systems\BEA Application Explorer\sessions"/>	Specify a session path.
Connection Name*	<input type="text" value="IDES"/>	Specify a connection.
<input type="button" value="Connect to EIS"/>		

**Note:** A red asterisk ( \* ) indicates that a field is required.

2. Specify a session path and connection name.

This information enables the application view to interact with the target HL7 system. You need enter this information only once per application view.

3. Click Connect to EIS.

You return to the Create New Browsing Connections, where you can specify connection pool parameters and logging levels. For more information, see *Using the Application Integration Design Console* at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

## Setting Service Properties



This information applies to “Step 6A, Add a Service to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

Adapter for HL7 uses services to make requests of the HL7 system. A service consists of both a request and a response. The Adapter for HL7 supports the following services:

- [File Service](#)

- [FTP Service](#)
- [MQ Service](#)
- [TCP Service](#)
- [HTTP Service](#)

## File Service

1 2 3 4 5 **6** 7 8 9

This information applies to “Step 6A, Add a Service to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

A File service sends an HL7 file to a specific directory on disk. The HL7 system responds to the file it receives, sending a service response to the adapter.

To configure a File Service:

1. Enter a unique service name that describes the function the service performs.
2. Select File System Write from the Select list.

The Add Services page displays the fields required for this service type.

*On this page, you add services to your application view.*

Unique Service Name:\*

Select: File System Write ▼

HL7 Version*	v.2.3 ▼
directory*	<input type="text"/>
output file name/mask*	<input type="text"/>

**Note:** A red asterisk ( \* ) indicates that a field is required.

3. Enter the following information:

**Table 3-1 File Service Parameters**

Parameter	Description
HL7 Version	Version of HL7 messages passed

**Table 3-1 File Service Parameters (Continued)**

Parameter	Description
directory	Directory to which messages are written
output file name/mask	The file name to be used for the output file generated as a result of this operation.  A * in the filename expands to a timestamp.  A # in the filename is a mask for a sequence count. Each pound symbol (#) represents an integer value. For example, File## counts up to 99 before restarting at 0. File### counts up to 999 before restarting at 0, and so on.

4. See “[Common Service and Event Settings](#)” on page 3-14 for information about selecting a schema and configuring logging and tracing.

## FTP Service



This information applies to “Step 6A, Add a Service to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

An FTP service sends an HL7 file to a specific directory on the FTP host. The HL7 system responds to the file it receives, sending a service response to the adapter.

To configure an FTP Service:

1. Enter a unique service name that describes the function the service performs.
2. Select FTP Write from the Select list.

The Add Services page displays the fields required for this service type.



On this page, you add services to your application view.

Unique Service Name: \*

Select:

HL7 Version*	<input type="text" value="v.2.3"/> <input type="button" value="v"/>
Host name*	<input type="text"/>
Port number	<input type="text"/>
User Id*	<input type="text"/>
Password*	<input type="text"/>
destination*	<input type="text"/>
output file name/mask*	<input type="text"/>
Retry Interval	<input type="text"/>
Maxtries	<input type="text"/>

**Note:** A red asterisk ( \* ) indicates that a field is required.

3. Enter the following information:

**Table 3-2 FTP Service Parameters**

Parameter	Description
HL7 Version	Version of HL7 messages passed
Host name	The name of the FTP host
Port number	Port number to use for the FTP connection. Leave this field blank to use the default port number.
User ID	The user name to log in to the FTP server
Password	The password of the FTP user
destination	The directory on the FTP server to which to write the file

**Table 3-2 FTP Service Parameters (Continued)**

Parameter	Description
output file name/mask	The file name to be used for the output file generated as a result of this operation.  A * in the filename expands to a timestamp.  A # in the filename is a mask for a sequence count. Each pound symbol (#) represents an integer value. For example, File## counts up to 99 before restarting at 0. File### counts up to 999 before restarting at 0, and so on.
Retry interval	The maximum wait interval between retries when a connection fails. This is in the format xxH:xxM:xxS For example, 1 hour, 2 minutes, and 3 seconds is: 1H:2M:3S
Maxtries	The maximum number of retries to attempt when the adapter fails to connect or write the file.

4. See “[Common Service and Event Settings](#)” on page 3-14 for information about selecting a schema and configuring logging and tracing.

## MQ Service



This information applies to “Step 6A, Add a Service to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

An MQ service sends a file to an IBM MQSeries or WebSphere MQ queue. The HL7 system responds to the file it receives, sending a service response to the adapter.

To configure an MQ Service:

1. Enter a unique service name that describes the function the service performs.
2. Select MQEmit from the Select list.

The Add Services page displays the fields required for this service type.

On this page, you add services to your application view.

Unique Service Name: \*

Select:  ▼

HL7 Version*	<input type="text" value="v.2.3"/> ▼
Queue Manager*	<input type="text"/>
Queue Name*	<input type="text"/>
Correlation Id	<input type="text"/>
MQ Client Host	<input type="text"/>
MQ Client Port	<input type="text"/>
MQ Client Channel	<input type="text"/>

**Note:** A red asterisk ( \* ) indicates that a field is required.

3. Enter the following information:

**Table 3-3 MQ Service Parameters**

Parameter	Description
HL7 Version	Version of HL7 messages passed
Queue Manager	The name of the MQ Queue Manager to be used
Queue Name	The name of the MQSeries or WebSphere MQ queue on which the HL7 documents are received
Correlation ID	The correlation ID used in the MQ message header
MQ Client Host	For MQ Client only. The host where the MQ Server is located
MQ Client Port	For MQ Client only. The port number used to connect to an MQ Server
MQ Client Channel	For MQ Client only. The channel between an MQ Client and MQ Server

See [“Common Service and Event Settings” on page 3-14](#) for information about selecting a schema and configuring logging and tracing.

# TCP Service

1 2 3 4 5 **6** 7 8 9

This information applies to “Step 6A, Add a Service to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

A TCP service sends an HL7 file to the HL7 system using the TCP protocol. The HL7 system responds to the file it receives, sending a service response to the adapter.

To configure a TCP Service:

1. Enter a unique service name that describes the function the service performs.
2. Select TCPEmit from the Select list.

The Add Services page displays the fields required for this service type.

*On this page, you add services to your application view.*

Unique Service Name:\*

Select: TCPEmit

HL7 Version*	v.2.3 <input type="button" value="v"/>
host*	<input type="text"/>
port*	<input type="text"/>

**Note:** A red asterisk ( \* ) indicates that a field is required.

3. Enter the following information:

**Table 3-4 TCP Service Parameters**

Parameter	Description
HL7 Version	Version of HL7 messages passed
host	The name or address of the TCP host
Port number	Port number to use for the TCP connection. Leave this field blank to use the default port number.

- See “[Common Service and Event Settings](#)” on page 3-14 for information about selecting a schema and configuring logging and tracing.

## HTTP Service

1 2 3 4 5 **6** 7 8 9

This information applies to “Step 6A, Add a Service to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

An HTTP service sends a file through HTTP to the HL7 system. The HL7 system responds to the file it receives, sending a service response to the adapter.

To configure an HTTP Service:

- Enter a unique service name that describes the function the service performs.
- Select HTTP from the Select list.

The Add Services page displays the fields required for this service type.

*On this page, you add services to your application view.*

Unique Service Name: \*

Select: HTTP

HL7 Version*	v.2.3 <input type="button" value="v"/>
URL*	<input type="text"/>
header1_name=header1_value	<input type="text"/>
header2_name=header2_value	<input type="text"/>
header3_name=header3_value	<input type="text"/>
header4_name=header4_value	<input type="text"/>
header5_name=header5_value	<input type="text"/>
header6_name=header6_value	<input type="text"/>
header7_name=header7_value	<input type="text"/>
header8_name=header8_value	<input type="text"/>
header9_name=header9_value	<input type="text"/>
header10_name=header10_value	<input type="text"/>

**Note:** A red asterisk ( \* ) indicates that a field is required.

3. Enter the following information:

**Table 3-5 HTTP Service Parameters**

Parameter	Description
HL7 Version	Version of HL7 messages passed
URL	The HTTP-compliant URL where the adapter is to post the file
header_name=header_value	Ten optional headers and values that can be passed in the post operation. Use the following format: headername=headervalue

4. See “[Common Service and Event Settings](#)” on page 3-14 for information about selecting a schema and configuring logging and tracing.

## Common Service and Event Settings



This information applies to “Step 6A, Add a Service to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

You select a schema and select logging options the same way for all services.

To set common service settings:

1. In the Schema list, select the schema you want to use with this service.

For more information, see [Chapter 2, “Generating Schemas for HL7 Documents.”](#)

schema:

2. Configure tracing for this service, as follows:

Tracing displays runtime information in the console. You set the type and amount of information you wish to capture as part of the final configuration tasks. This is described in detail in *Using the Application Integration Design Console*.

### settings

Trace on/off	<input type="checkbox"/>
Verbose Trace on/off	<input type="checkbox"/>
Document Trace on/off	<input type="checkbox"/>

- a. Select the Trace on/off check box to enable tracing for this service. Tracing information appears in the runtime console.
  - b. Select the Verbose Trace on/off check box to enable more detailed tracing for this service.
  - c. Select the Document Trace on/off check box to include the document in the tracing information captured for this service.
3. Click Add to add the service.

For more information about the next step, see *Using the Application Integration Design Console* at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

## Setting Event Properties



This information applies to “Step 6B, Add an Event to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

An event defines how your application responds to events generated by HL7. The Adapter for HL7 supports the following events:

- [File Event](#)
- [FTP Event](#)
- [MQ Event](#)
- [TCP Event](#)
- [HTTP Event](#)

### File Event



This information applies to “Step 6B, Add an Event to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

In a File Event, the adapter picks up a file from a specific location on disk and passes it to an event variable that is set in a business process.

To configure a File Event:

1. Enter a unique event name that describes the function the event performs.
2. Select File System from the Select list.

The Add Events page displays the fields required for this event type.

*On this page, you add events to your application view.*

Unique Event Name: \*

Select:  ▾

Location*	<input type="text"/>
File Suffix*	<input type="text"/>
Polling interval	<input type="text" value="1"/>
Sort	<input type="checkbox"/>
Scan sub-directories	<input type="checkbox"/>
File-read limit (per scan)	<input type="text"/>
HL7 Version*	<input type="button" value="v2.3"/> ▾
Character Set Encoding*	<input type="button" value="ISO-8859-1"/> ▾

**Note:** A red asterisk ( \* ) indicates that a field is required.

3. Enter the following information:

**Table 3-6 File Event Parameters**

Parameter	Description
Location	<p>The directory where messages are received. DOS-style file patterns are valid for this parameter. You can specify a file pattern as well as a directory. For example, c : \xyz \ab*cd (without a file suffix) takes the file suffix from that parameter.</p> <p>If you use a pattern, files are selected based on the suffix and then the pattern. AB?CD selects ABxCD. AB*CD selects ABxxxCD.</p>



**Table 3-6 File Event Parameters (Continued)**

Parameter	Description
File Suffix	<p>File extension for the file event. This limits input files to those with the specified extensions. The “.” is not required. The minus sign (“-”) indicates that there is no extension.</p> <p>If the file extension is <code>zip</code>, the unzipped files must conform to the event schema, or they will fail. This function also works with transform configured.</p>
Polling interval	<p>This is a time, expressed as <code>xxH:xxM:xxS</code>. For example 1 hour, 2 minutes, and 3 seconds is: <code>1H:2M:3S</code></p> <p>This value is the maximum interval between checks for new documents. The higher this value, the longer the interval, and the fewer system resources that are used. The side effect of a high value is that a worker thread cannot respond to a stop command. If this value is set to 0, the listener runs once and terminates. The default value is 2 seconds.</p>
Sort	Sort incoming documents by arrival time. This is a boolean. Valid values are <code>TRUE</code> or <code>FALSE</code> . Setting this value to <code>TRUE</code> maintains the sequence of incoming documents, but may slow performance.
Scan sub-directories	Setting for scanning subdirectories for document to be processed. This is a boolean. Valid values are <code>TRUE</code> or <code>FALSE</code> .
File read limit (per scan)	The number of files read per sweep of the file directory
HL7 Version	Version of HL7 messages passed
Character Set Encoding	The character set encoding for inbound documents. For example, <code>UTF-8</code> . The default value is <code>ISO-8859-1 US and Western Europe</code> .

- See “[Common Service and Event Settings](#)” on page 3-14 for information about selecting a schema and configuring logging and tracing.

## FTP Event



This information applies to “Step 6B, Add an Event to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

In an FTP Event, the adapter picks up a file from a specific location on the FTP host and passes it to an event variable that is set in a business process.

To configure an FTP Event:

1. Enter a unique event name that describes the function the event performs.
2. Select FTP from the Select list.

The Add Events page displays the fields required for this event type.

*On this page, you add events to your application view.*

Unique Event Name: \*

Select:

User Id*	<input type="text"/>
Password*	<input type="text"/>
Host name*	<input type="text"/>
Location*	<input type="text"/>
File suffix	<input type="text"/>
Polling interval	<input type="text"/>
HL7 Version*	<input type="text" value="v2.3"/>
Character Set Encoding*	<input type="text" value="ISO-8859-1"/>

**Note:** A red asterisk ( \* ) indicates that a field is required.

3. Enter the following information:

**Table 3-7 FTP Event Parameters**

Parameter	Description
User ID	The user name to log in to the FTP server
Password	The password of the FTP user
Host name	The name of the FTP host

**Table 3-7 FTP Event Parameters (Continued)**

Parameter	Description
Location	<p>The directory on the FTP host from which to retrieve messages.</p> <p>You must append the file suffix (extension) to the file or files specified in this field. For example, you can specify a particular file such as: <code>/path/to/my/ftp/directory/myfile.xml</code> or a group of files, such as: <code>/path/to/my/ftp/directory/*.zip</code></p> <p>DOS-style file patterns are valid for this parameter.</p> <p>If you use a pattern, files are selected based on the suffix and then the pattern. <code>AB?CD</code> selects <code>ABxCD</code>. <code>AB*CD</code> selects <code>ABxxxCD</code>.</p> <p>If the file extension is <code>zip</code>, the unzipped files must conform to the event schema, or they will fail. This function also works with transform configured.</p>
File Suffix	This field is no longer used. You must specify a suffix in the location field.
Polling interval	<p>This is a time, expressed as <code>xxH:xxM:xxS</code>. For example 1 hour, 2 minutes, and 3 seconds is: <code>1H:2M:3S</code></p> <p>This value is the maximum interval between checks for new documents. The higher this value, the longer the interval, and the fewer system resources that are used. The side effect of a high value is that a worker thread cannot respond to a stop command. If this value is set to 0, the listener runs once and terminates. The default value is 2 seconds.</p>
HL7 Version	Version of HL7 messages passed
Character Set Encoding	The character set encoding for inbound documents. For example, UTF-8. The default value is ISO-8859-1 US and Western Europe.

- See “[Common Service and Event Settings](#)” on page 3-14 for information about selecting a schema and configuring logging and tracing.

## MQ Event



This information applies to “Step 6B, Add an Event to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

In an MQ Event, the adapter picks up a file from a specific IBM MQSeries or WebSphere MQ queue and passes it to an event variable that is set in a business process.

To configure an MQ Event:

1. Enter a unique event name that describes the function the event performs.
2. Select MQ from the Select list.

The Add Events page displays the fields required for this event type.

*On this page, you add events to your application view.*

Unique Event Name:\*

Select:

Queue Manager*	<input type="text"/>
Queue Name*	<input type="text"/>
MQ Client Host	<input type="text"/>
MQ Client Port	<input type="text"/>
MQ Client Channel	<input type="text"/>
Polling Interval	<input type="text"/>
HL7 Version*	<input type="text" value="v2.3"/>
Character Set Encoding*	<input type="text" value="ISO-8859-1"/>

**Note:** A red asterisk ( \* ) indicates that a field is required.

3. Enter the following information:

**Table 3-8 MQ Event Parameters**

Parameter	Description
Queue Manager	The name of the MQ Queue Manager to be used
Queue Name	The name of the MQSeries or WebSphere MQ queue that the adapter polls for a document
MQ Client Host	For MQ Client only. The host where the MQ Server is located
MQ Client Port	For MQ Client only. The port number used to connect to an MQ Server
MQ Client Channel	For MQ Client only. The channel between an MQ Client and MQ Server

**Table 3-8 MQ Event Parameters (Continued)**

Parameter	Description
Polling Interval	The maximum wait interval (in the format <i>nnH:nnM:nnS</i> ) between checks for new documents. The higher this value, the longer the interval, and the fewer system resources that are used. However, if you set a high value, the worker thread cannot respond to a stop command. If timeout is set to 0, the listener runs once and terminates. Default is 2 seconds.
HL7 Version	Version of HL7 messages passed
Character Set Encoding	The character set encoding for inbound documents. For example, UTF-8. The default value is ISO-8859-1 US and Western Europe.

4. See “[Common Service and Event Settings](#)” on page 3-14 for information about selecting a schema and configuring logging and tracing.

## TCP Event

1 2 3 4 5 **6** 7 8 9

This information applies to “Step 6B, Add an Event to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

In a TCP Event, the adapter picks up a file via TCP and passes it to an event variable that is set in a business process.

To configure a TCP Event:

1. Enter a unique event name that describes the function the event performs.
2. Select TCP from the Select list.

The Add Events page displays the fields required for this event type.

On this page, you add events to your application view.

Unique Event Name:\*

Select:

TCP/IP Port*	<input type="text"/>
Allowable client host	<input type="text"/>
HL7 Version*	<input type="text" value="v2.3"/>
Character Set Encoding*	<input type="text" value="ISO-8859-1"/>

**Note:** A red asterisk ( \* ) indicates that a field is required.

3. Enter the following information:

**Table 3-9 TCP Event Parameters**

Parameter	Description
TCP/IP Port	The TCP port the adapter listens on
Allowable client host	The name or address of the client restricted to accessing this adapter
HL7 Version	Version of HL7 messages passed
Character Set Encoding	The character set encoding for inbound documents. For example, UTF-8. The default value is ISO-8859-1 US and Western Europe.

4. See “[Common Service and Event Settings](#)” on page 3-14 for information about selecting a schema and configuring logging and tracing.

## HTTP Event

1 2 3 4 5 **6** 7 8 9

This information applies to “Step 6B, Add an Event to an Application View” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

In an HTTP Event, the adapter picks up a file via HTTP and passes it to an event variable that is set in a business process.

To configure an HTTP Event:

1. Enter a unique event name that describes the function the event performs.
2. Select HTTP from the Select list.

The Add Events page displays the fields required for this event type.

*On this page, you add events to your application view.*

Unique Event Name:\*

Select:

port*	<input type="text"/>
HL7 Version*	v2.3 <input type="button" value="v"/>
Character Set Encoding*	ISO-8859-1 <input type="button" value="ISO"/>

**Note:** A red asterisk ( \* ) indicates that a field is required.

3. Enter the following information:

**Table 3-10 HTTP Event Parameters**

Parameter	Description
port	The port where the adapter should listen for the HTTP transfer
HL7 Version	Version of HL7 messages passed
Character Set Encoding	The character set encoding for inbound documents. For example, UTF-8. The default value is ISO-8859-1 US and Western Europe.

4. See “Common Service and Event Settings” on page 3-14 for information about selecting a schema and configuring logging and tracing.

## Defining Event Connection Parameters



This information applies to “Step 7, Perform Final Configuration Tasks” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

Once you have finished adding services and events and have saved your application view, you must perform some final configuration tasks, including configuring event delivery connections,

before testing the services and events. You perform these configuration tasks from the Final Configuration and Testing page.

To define event connection parameters:

1. In Connections area on the Application View Administration page, click Select/Edit.
2. In the Event Connection area, click Event to edit the default event connection.

The Configure Event Delivery Parameters page appears.

*On this page, you supply parameters to configure event delivery for this ApplicationView*

Password:	<input type="text"/>
SleepCount:	<input type="text"/>
UserName:	<input type="text"/>

Enter connection information for your system.

**Note:** A red asterisk ( \* ) indicates that a field is required.

3. Enter the following information:

**Table 3-11 Event Connection Parameters**

Parameter	Description
Password	The password for your WebLogic Server Administration Console user name
SleepCount	The number of seconds the adapter will wait between polling for events
UserName	Your WebLogic Server Administration Console user name, defined in the startWebLogic script

The event delivery parameters you enter on this page enable connection to your HL7 system and are used when generating events. The parameters are specific to the associated adapter and are defined in the `wli-ra.xml` file within the base adapter.

4. Click Save to save your event delivery parameter settings. Click Continue to return to the Edit Event Adapter page, and then click Back to return to the Final Configuration and Testing page.



The Edit Event Adapter page allows you to define event parameters and configure the information that will be logged for the connection factory. Select one of the following settings for the log:

- Log errors and audit messages
- Log warnings, errors, and audit messages
- Log informational, warning, error, and audit messages
- Log all messages

**Note:** For maximum tracing, select Log all Messages. This is the recommended setting to use when you are collecting debugging information for BEA support.

The table that follows describes the type of information that each logging message contains.

**Table 3-12 Logging message categories**

This type of message	Contains
Audit	Extremely important information related to the business processing performed by an adapter
Error	Information about an error that has occurred in the adapter, which may affect system stability
Warning	Information about a suspicious situation that has occurred. Although this is not an error, it could have an impact on adapter operation.
Information	Information about normal adapter operations

## Testing Services



This information applies to “Step 8A, Test an Application View’s Services” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

The purpose of testing an application view service is to evaluate whether that service interacts properly with the target HL7 system. When you test a service, you supply any inputs required to start the service. For the Adapter for HL7, the input is in the form of a valid XML string that acts as input for the service.

**Note:** You can test an application view only if it is deployed and only if it contains at least one event or service.

To test a service:

1. In the Application View Administration page, click the Test link beside the service to be tested.

The Test Services page appears.

2. In the Test Service window, copy the appropriate XML strings.
3. Click Test.

The results appear in the Test Results window.

If you are testing an MQ service, you can also check your MQSeries Explorer for results (select Queue Managers>*MyQueueManager*>Queues). If the service ran correctly, the queue now contains the message.

## Testing Events Using a Service



This information applies to “Step 8B, Test an Application View’s Events” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

The purpose of testing an application view event is to make sure that the adapter correctly handles events generated by HL7. When you test an event, you can trigger the event using a service or manually.

**Note:** You can test an application view only if it is deployed and only if it contains at least one event or service.

To test an event:

1. In the Application View Administration page, click the Test link beside the service to be tested.

The Test Events page appears.

2. Click Service and select a service that triggers the event you are testing.
3. In the Time field, enter a reasonable period of time to wait, specified in milliseconds, before the test times out (One second = 1000 milliseconds. One minute = 60,000 milliseconds.).

4. Click Test and enter the XML string needed to trigger the service.

The service is executed.

- If the test succeeds, the Test Result page appears, showing the event document, the service input document, and the service output document.
- If the test fails, the Test Result page displays only a Timed Out message.

## Testing Events Manually



This information applies to “Step 8B, Test an Application View’s Events” in *Using the Application Integration Design Console*, at the following URL:

<http://edocs.bea.com/wli/docs81/aiuser/index.html>

To test an event manually:

1. In the Time field, enter a reasonable period of time to wait, specified in milliseconds, before the test times out (One second = 1000 milliseconds. One minute = 60,000 milliseconds.).
2. Click Test. The test waits for an event to trigger it.
3. Using the triggering HL7 application, perform an action that executes the service that, in turn, tests the application view event.
  - If the test succeeds, the Test Result page appears. This page displays the event document from the application, the service input document, and the service output document.
  - If the test fails or takes too long, the Test Result page appears, showing a Timed Out message.



# Writing and Editing Rule Specification Files

This section explains how to write and edit rule specification files. It includes the following topics:

- [Writing Rule Specification Files](#)
- [About Built-in HL7 Rules](#)
- [About the HL7 Rule Set](#)
- [Writing Rules In Java](#)
- [Writing Rule Search Routines in Java](#)

A complete set of validation rules is supplied with the BEA WebLogic Adapter for HL7. However, occasionally it may be necessary to edit the supplied rule specification files. Also, validation may be applied to another type of document by creating a new rule specification file for it. This section provides details on constructing or editing a rule specification file.

## Writing Rule Specification Files

This section describes rule specification files, how to use them, and how to create new rules files.

It contains the following sections:

- [About Rule Specification Files](#)
- [Creating a Simple Rule Specification File](#)
- [About the Syntax for Writing Rules](#)

## About Rule Specification Files

The rule specification file is an XML document. One file must exist for each document type to be validated, as defined by its XML root element. For clarity, the root element of the rules file should match the root element of the document being validated. Contained within root element are the individual *rule* elements.

A production rule specification likely has many <rule> elements, as many as are required to validate the entire document. Building a complete rule specification involves identifying each element to be validated and selecting the appropriate rule for the type of validation required. For example, the checkList rule validates that the element contains only values from the supplied list. There also is an isFDate rule that validates that the element value has the proper date format (CCYYMMDD).

## Creating a Simple Rule Specification File

The structure for a simple rule specification file could be as follows:

```
<TestDoc>
  <using class="XDHI7Rules">
    <rule tag="EL1"    method="checkList"    code="a,b,c" />
    <rule tag="EL99"   method="isFDate"     code="RD8" />
  </using>
</TestDoc>
```

Here:

```
<TestDoc>
```

Represents the XML type of the document to be validated.

```
<using class="XDHI7Rules">
```

Selects a global rule class to be used. This option also eliminates the need to specify the class on each individual <rule> element. In this case, the built-in HL7 rule set, XDHI7Rules, is to be used. You may also write your own custom rule set in a Java class and specify it here. To learn more about creating custom rules in Java, see [Writing Rules In Java](#)

```
<rule tag="EL1">
```

Indicates that a rule is to be applied to the segment or element called "EL1".

```
method="checkList"
```

Identifies the actual rule to be applied. (This is a method of the global class being used as specified above; in this case, "XDHI7Rules"). The checkList rule validates that an

element contains only values from a defined list. There are many such built-in rules (see [“About the Syntax for Writing Rules” on page 4-3](#)).

`code="a,b,c"`

Is a parameter that the rule uses. In this case, `checkList` would validate that the SEG1 element contains values from this list (“a,b,c”). Each rule has a different set of parameters (see [“About the Syntax for Writing Rules” on page 4-3](#)).

`<rule tag="EL99" method="isFDate" code="RD8"/>`

Is a rule applied to an element named “EL99”. The rule to be applied is `isFDate`, which verifies that the element value contains a date format. In this case, the `code` attribute specifies which date format the value should be.

## About the Syntax for Writing Rules

The following table lists the general syntax for writing rules.

**Table 4-1 Rules for Writing Syntax**

Rule Element	Attribute	Description
<code>&lt;using&gt;</code>	<code>class=</code>	The Java program class containing all <code>&lt;rule&gt;</code> s within the section, unless overridden by a <code>class=</code> attribute in the <code>&lt;rule&gt;</code> entry itself.
<code>&lt;rule&gt;</code>	<code>tag=</code>	Names the right-most parts of the tag to which this rule applies. The rule applies to any node of the document that meets the tag criteria. For example, <code>DTM</code> causes this rule to be applied to every <code>DTM</code> in the incoming document. <code>X.DTM</code> applies to all <code>DTM</code> parts prefixed by <code>X</code> . Tags are case sensitive. If omitted, <code>stag</code> must be used.
<code>&lt;rule&gt;</code>	<code>stag=</code>	For HL7 documents, this is a specification subsection tag. For more information, see <a href="#">“About the Syntax for Writing Rules” on page 4-3</a> .
<code>&lt;rule&gt;</code>	<code>name=</code>	The rule’s identification; should be a unique name. This is used in trace messages to specify which rule caused a violation. If omitted, no unique identification can be given.

**Table 4-1 Rules for Writing Syntax (Continued)**

<b>Rule Element</b>	<b>Attribute</b>	<b>Description</b>
<code>&lt;rule&gt;</code>	<code>class=</code>	The rule class to which this rule belongs. This corresponds to a Java object class, and each rule is a method of the class. If this is omitted, the class from the enclosing USING tag is used.
<code>&lt;rule&gt;</code>	<code>method=</code>	The specific rule.
<code>&lt;rule&gt;</code>	<code>usage=</code>	Specify <code>usage=M</code> (mandatory) to indicate that there must be a value in the identified node. This check is applied before the actual rule logic is executed.

The rule *tag* and *method* attributes are required. The remaining attributes are rule-specific and their inclusion is based on the rule itself. The validation engine uses the required tags to identify the rule in question and to identify the node or nodes of the document to which it applies.

The rule document is located by the `<validation>` tag value in the dictionary's *system* section, and is identified with the specific document in its `<document>` entry.

## About Built-in HL7 Rules

The validation engine provides a set of HL7 rules (`class=XDH17Rules`) that can be used to validate most HL7 situations. You can apply these rules to any part of the incoming document. The rules use a standard set of attributes, as well as specialized attributes. Where the standard attributes are used, they are listed by name and not further described under each rule.

For HL7 documents, the `tag=` attribute used to position the rule has been joined by a `stag=` (specification tag) attribute. One or the other may be used. `Stag=` positions to a specification section at the appropriate subchild. For example, `stag=BPRO4` applies the rule to the fourth child of every BPR in the document.

Either `tag=` or `stag=` specifications allow subsection specification by appending `:<subsection>` to the end of the tag. Subsections are base 1. For example, if the value of a field, ABC03 is HC:123:XY, to apply the isN rule to the 123 subsection, the address would be `stag=ABC03:2`. Regardless of the subfield separator character (specified in character 104 of the ISA segment), the colon is used in the addressing tag.



## Using If/Then Date Format Rules

Some segments contain a triplet consisting of a subfield:

1. A code.
2. A date or time format such as RD8.
3. A date or time value encoded as per the designated format.

The allowed format depends on the code. To accommodate this, the code= attribute can be an if/then set:

```
code="if/then, if/then..."
```

Here the if and then clauses allow several items, separated by a |. If the code is in the if list, the format must be in the then list. If the code is not in the if list, the rule steps to the next if list. For example:

```
code="416|19/D8|RD8, 22/TM, 77/"
```

To omit the then clause, enter no information after the '/. In the above example, this would signify that if the type is 77, then no date format or date is to be checked.

## About the HL7 Rule Set

The following is a list of methods called by the rules engine to validate a document.

### isN

isN validates that a node is numeric with an optional leading sign.

```
<rule tag="xx" method="isN" />
```

**Table 4-2 isN**

Attribute	Meaning
min	Minimum number of digits required, not including sign. Optional.
max	Maximum number of digits permitted, not including sign. Optional.

### isR

isR validates that a node is numeric with an optional leading sign and a single decimal point.

```
<rule tag="xx" class="XDHL7Rules" method="isR" />
```

**Table 4-3 isR**

Attribute	Meaning
min	Minimum number of digits required, not including sign or radix. Optional.
max	Maximum number of digits permitted, not including sign or radix. Optional.

## isDate

isDate validates that a node is a CCYYMMDD format.

```
<rule tag="xx" class="XDHL7Rules" method="isDate" />
```

**Table 4-4 isR**

Attribute	Meaning
min	Minimum number of positions required. If omitted, 8 is assumed.
max	Maximum positions permitted. If omitted, 8 is assumed.

## isTime

isTime validates that a node is in HHMM[SS] format.

```
<rule tag="xx" method="isTime" />
```

**Table 4-5 isTime**

Attribute	Meaning
None	Not applicable.

## isFDATE

isFDate validates that a node has a proper date qualifier format (such as RD8) based on the code list. If the qualifier is in the list, then the next field must be a date in the format as defined by the qualifier. If the date is null, then the rule is successful.

```
<rule stag=CR603 method="isFDate" code="RD8" />
```

This example checks that the date value in field CR604 is formatted as per CR603.

**Table 4-6 isFDATE**

Attribute	Meaning
code	List of valid qualifiers.

## checkLen

checkLen validates that a node is of sufficient size (length). Note that many rules provide minimum and maximum checking. In such cases, do not use this rule, as it is not necessary.

```
<rule stag=HI03:3 method="checkLen" min="2" max="8" />
```

**Table 4-7 checkLen**

Attribute	Meaning
min	Minimum number of characters - Optional. If omitted, no check is performed.
max	Maximum number of characters - Optional. If omitted, no check is performed.

## checkUsage

checkUsage validates the presence of segment elements or components according to a pattern. The patterns validate the code in the independent variable. The *tag=* or *stag=* attribute can be used to locate the section to which the rule applies. The *domain=* attribute specifies whether elements or components are to be tested.

```
<rule name="simpler" tag="NAM" method="checkUsage" code="1=BK / S2 + R3,
3 ! BR + 5=KK / N2 + S3" />
```

```
<rule name="any" tag="NAM" method="checkUsage" code="1=?/ S2 + R3"/>
<rule name="complex" tag="QQ" method="checkUsage" code="2:3=CD + ((1=XX |
3=BP) | 1=AB)/R1 + (N3:1 | R:2)" />
```

In the “simpler” example, the value of the NAM element is under examination. If the value in child 1 contains BK, then check the usages of components 2 and 3. If the value in component 3 is NOT BR and the value in component 5 is KK, then component 2 must be null and component 3 may be null.

In the “any” example, 1=?/xxx means that if field 1 has any code but is not empty, then the remainder of the rule is evaluated.

The “complex” example demonstrates that nested logical conditions are allowed on either the if or the then side of the equation.

The values to be checked are expressed as <child>:<part> where either is optional. If <child> addressing is used, 03 in SVC, which is the third child of the SVC segment. Then, while a *stag* could address SVC03, the *tag* should be used to address the SVC directly.

Note that + is used for and to avoid the need to escape the & entity.

**Table 4-8**

Attribute	Meaning
Code	<p>The if/then validation criteria in the form</p> <pre>code := &lt;item&gt; [,&lt;item&gt;]*       item := &lt;if_exp&gt;[+   &lt;if_exp&gt;]*/&lt;then_spec&gt; [+   &lt;then_spec&gt;]*       if_exp := &lt;position&gt;&lt;op&gt;&lt;value&gt;       then_spec := &lt;action&gt;&lt;position&gt;       position := child   :composite   child:composite       child := integer       composite := integer       op := !   =</pre>
<b>&lt;action&gt; codes</b>	
R	A value in the field is required and must not be null.
N	The value in the field must be null, or the field must be missing.
S	The field may contain either a value or a null.
<p>A &lt;value&gt; of ? in an if clause means that the then side applies regardless of the code value.</p>	

## isCDate

isCDate validates that a node has a proper date qualifier format (such as RD8) based on the code list. If the qualifier is in the list, then the next field must be a date in the format as defined by the qualifier. This differs from isFDate() in that it uses portions of the value field of the node for data rather than following data fields.

```
<rule stag=CR603 method="isCDate" code="RD8" format="3", value="4"/>
```

**Table 4-9 isCDate**

Attribute	Meaning
code	List of valid qualifiers or if/then list if <i>type=</i> used.
format	Subfield number (base 1) containing the format position to be checked.
value	Subfield number (base 1) containing the date value to be checked.
type	Optional. If used, the code must be an if/then format (see <a href="#">“Using If/Then Date Format Rules” on page 4-5</a> ) rather than a simple list. The <i>type=</i> attribute identifies the piece (base 1) containing the qualifier to test against the if side of the if/then rule.

## checkList

checkList validates that the content of a field is in the list. This must address a single field. The list may be explicitly defined or in a supplied file.

```
<rule tag="NM1. _01_Entity_Identifier_Code_" method="checkList"
  code="BD,BS,FI,MC,PC,SL,UP,XX" />
```

```
<rule tag="NM1. _01_Entity_Identifier_Code_" method="checkList"
  code="@ZIPCODES" />
```

**Table 4-10 checkList**

Attribute	Meaning
code	<p>One of the following:</p> <ol style="list-style-type: none"> <li>1. A list of comma separated codes.</li> <li>2. The @ symbol to specify a file that contains the list. The name supplied is an alias that must be resolved in the Custom Dictionary &lt;system&gt;&lt;preload&gt; section (see the following example).</li> <li>3. The name of a code list search routine.</li> </ol> <p>Code list search routines are Java classes that extend XDRuleList().</p>

## Example: Resolving a Checklist File Alias In the Custom Dictionary

This is the syntax required when using the checkList function with a file.

```
<system>
  <preload>
    <name file="XDRuleListFile(C:\\Hl7Codes\\ZipCodes.txt)">ZIPCODES</name>
  </preload>
</system>
```

The checkList supports a provided procedure named XDRuleListFile() that accepts a single parameter of the file name. The file must consist of a series of codes separated by blanks, commas, or new lines. For example, to use a rule that employs one of these built-in code lists, enter the procedure into the dictionary using the console, or add a <preload> entry to the <system> area of the dictionary. An example of how to accomplish this is given in [“Writing Rule Search Routines in Java” on page 4-14](#).

## checkEQ

checkEQ validates that if element a is present, element b must also be present and be equal to a. The elements a and b must be stags.

```
<rule tag="root" method="checkEQ" a="BPR10" b="TRB03" />
```

**Table 4-11 checkEQ**

Attribute	Meaning
a	Value that triggers the rule.
b	Value that must be equal to a if a is present and has a value.

## segXO

segXO exclusive or segment a or b may be present, but not both.

```
<rule tag="root" method="segXO" a="MIA" b="MOA" />
```

**Table 4-12 segXO**

Attribute	Meaning
a	First value.

**Table 4-12 segX0**

Attribute	Meaning
b	Second value.

## Writing Rules In Java

Rules can be written in Java, loaded by the system at startup, and applied by specification in a rule. A rule class extends `XDRuleClass` and can make use of any of its services. Each public method in the rule class that meets the rule signature can be applied by name as a rule. The rule methods can make use of service methods in the parental `XDRuleClass`.

In this example, a node is checked to determine whether its value is the word identified by the `value=` attribute. If it is not, an error has occurred.

On entry to the rule, the following parameters are passed:

**Table 4-13 Rules in Java**

Parameter	Description
Node	The node identified by the tag attribute in the rule. The rule method is called once for each node that matches the tag specification.
Value	The data value of the addressed node. This differs from the <code>node.getValue()</code> return if the tag contained a subfield address (for example, <code>tag=x:2</code> ).
Attributes	A <code>HashMap</code> of rule attributes. The rule method can check for any attributes that it desires. A <code>HashMap</code> is a fast implementation of a <code>Hashtable</code> that does not serialize.

### Example: Writing Rules in Java

This section describes how to write rules in Java for special situations.

```
import java.util.*;
import com.ibi.edaqm.*;
public class XDMyRules extends XDRuleClass
{
    public XDMyRules()
    {
```



```

    }
    public void specialRule(XDNode node, String value,
                           HashMap attributes)
                           throws XDEException
    {
        trace(XD.TRACE_DEBUG, "specialRule called with parms: " +
              node.getFullName() + ", " + attributes.toString());
        String testValue = (String)attributes.get("value");
        if (value.equals(testValue) )
        {
            node.setAssociatedVector(new XDEDIError(4, 0, error,"explanation"));
            throw new XDEException(XD.RULE, XD.RULE_VIOLATION,"node value
            "+value+" is not 'Value'");
        }
    }
}

```

Rule violations should throw an XDEException describing the violation.

The parental class provides a group of services to assist in preparing rules:

Method	Purpose
boolean isYYYYMMDD(String date)	Validates that a date is formatted correctly.
boolean isInList(String list, String value)	The value must be in the list.
void trace(int level, String msg)	The text of the message is written to the system trace file. The level should be XD.TRACE_DEBUG, XD.TRACE_ERROR, or XD.TRACE_ALL.

Rules can also use all methods in XDNode to address the values in the passed node and the tree in general.

Rule violations must be returned as XDEExceptions of class XD.RULE. Two causes are available: XD.RULE\_SYNTAX if the rule is in error, and XD.RULE\_VIOLATION if the data violates the rule. Syntax errors cause the document to be aborted, since it is presumed that rules have been

debugged. Violations are posted to the node by the rule, and the engine continues to process the document. Violations are traced by the engine and affect the later acknowledgement generation.

The error itself is posted to the node using the standard `XDNode` service `setAssociatedVector` (Object `o`), which records an object with the node. The special `EDIErrors` object, shown above, contains four elements:

Element	Meaning
Class	Class of the error. Should be 4 for a syntax error, resulting in AK4.
Reserved	Must be 0.
Error code	Code to be returned in the AKx (997).
Explanation	A string explaining the error. For use in tracing.

## Writing Rule Search Routines in Java

Short lists can be searched by built-in rule engine code. Longer lists, where the values in the list are obtained from an external source rather than from the attribute directly, require a rule list searcher tailored to the source. Lists might be obtained from a:

- Simple file.
- Database with values loaded at startup.
- Database with an access at each search request.

Each list may require its own search logic, tailored to the source and format of the list itself. To accommodate this, the rule engine allows list-specific search routines to be developed and added to the system. These routines are loaded at system initialization and terminated at system shutdown. Each routine must offer a search method that determines whether the passed value is valid.

Search routines must extend the `XDRuleList` class, which is part of the `com.ibm.edaqlm.XDRuleClass` package. The routine must offer three methods in the manner common to all XD extensions:

- `init (String[] args)` is called once at system initialization.
- `term ()` is called once at system termination. This method is called optionally.
- `search (String value)` is called when the rule is executed.

The Rule List search code is identified in the <preload> section of the <system> area of the dictionary. The Preloads console page manages this section.

```
<preload>
  <name file="RuleFileList(c:\ziplist.txt)" comment="validates zip
codes">ziplist</name>
</preload>
```

The following code specifies that a rule can be written that names the preloaded routine. This routine might load a list from a text file:

```
<rule tag="xxx" code="@ziplist" method="checklist"/>
```

## Example: Loading a Java File

The following is an example of loading a file containing codes:

```
import com.ibi.edaqm.*;
import java.util.*;
import java.io.*;
/**
 * A rule list handler is a routine called to enable users search lists during
 * execution
 * or the checkList rule. checkList() is a generally available rule to test
 * whether the
 * contents of a document field are valid. The rule list handler is invoked when
 * the code= attribute indicates the name of a coder routine rather than a simple
 * list.<P>
 * For example, <I>code="@list1"</I> will cause the search routine of the list1
 * class to
 * be invoked.<P>
 * The file read by this procedure consists of tokens separated by new line,
 * white space or commas.
 */
public class XDRuleListFile extends XDRuleList
{
    String[] list;
    ArrayList al = new ArrayList(127);
    public XDRuleListFile()
    {
    }
}
/**
 * The init method is called when a rule is loaded. It can perform any
 * necessary
 * initialization, and can store any persistent information in the object
 * store.
 */
}
```

```

    * @param parms Array of parameter string passed within the start command
init-name(parms).
    */
    public void init(String[] parms) throws XDException
    {
        if (parms == null)
        {
            throw new XDException(XD.RULE, XD.RULE_SYNTAX, "no parms
sent to " + name);
        }
        try
        {
            File f = new File(parms[0]);
            FileInputStream fs = new FileInputStream(f);
            long len = f.length();
            byte[] b = new byte[(int)len];
            fs.read(b);
            fs.close();
            String data = new String(b);
            StringTokenizer st = new StringTokenizer(data, " " +
XD.NEWLINE);
            while (st.hasMoreTokens())
            {
                String part = st.nextToken();
                al.add(part);
            }
        }
        catch (FileNotFoundException e)
        {
            throw new XDException(XD.RULE, XD.RULE_SYNTAX, "list file
"+parms[0] + " not found");
        }
        catch (IOException eio)
        {
            throw new XDException(XD.RULE, XD.RULE_SYNTAX, eio.toString());
        }
    }
    /**
    * The term() method is called when the worker is terminated. It is

```

NOT guaranteed

\* to be call, and applications should not rely upon this method to update data bases or

\* perform other critical operations.

\*/

public void term()

{

}

/\*\*

\* Search the given value to determine whether it is in the list.

\*

\* @param value String to test against the list

\* @return true if found, false otherwise

\*/

public boolean search(String value)

{

return al.contains(value);

}

}



# HL7 Document Index

This section documents the reference material supplied with the BEA WebLogic Adapter for HL7. It includes the following topics:

- [Message Definition Files](#)
- [Field Definitions](#)
- [Data Type Definitions](#)
- [Lookup Validation](#)
- [Sample Conversion](#)
- [Validation Rules File](#)
- [Error Codes](#)

## Message Definition Files

This section discusses the two main schema files that describe the HL7 messages (`Message.xsd` and `Segments.xsd`). These files describe to the HL7 parser how the HL7 messages are formatted.

# Messages.xsd

## Listing A-1 Messages.xsd

---

```
<?xml version = "1.0" encoding = "ISO-8859-1" ?>
<schema>

<!-- MESSAGE ORU_R01 -->
<!-- .. groups used in message ORU_R01 -->
<element name="ORU_R01.GROUP.1">
  <complexType>
    <sequence>
      <element minOccurs="0" maxOccurs="1" ref="OBX" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NTE" />
    </sequence>
  </complexType>
</element>
<element name="ORU_R01.GROUP.2">
  <complexType>
    <sequence>
      <element minOccurs="0" maxOccurs="1" ref="ORC" />
      <element minOccurs="1" maxOccurs="1" ref="OBR" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NTE" />
      <element minOccurs="1" maxOccurs="unbounded" ref="ORU_R01.GROUP.1" />
      <element minOccurs="0" maxOccurs="unbounded" ref="CTI" />
    </sequence>
  </complexType>
</element>
<element name="ORU_R01.GROUP.3">
  <complexType>
    <sequence>
      <element minOccurs="1" maxOccurs="1" ref="PID" />
      <element minOccurs="0" maxOccurs="1" ref="PD1" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NTE" />
      <element minOccurs="0" maxOccurs="1" ref="ORU_R01.GROUP.5" />
    </sequence>
  </complexType>
</element>
<element name="ORU_R01.GROUP.4">
  <complexType>
    <sequence>
      <element minOccurs="0" maxOccurs="1" ref="ORU_R01.GROUP.3" />
      <element minOccurs="1" maxOccurs="unbounded" ref="ORU_R01.GROUP.2" />
    </sequence>
  </complexType>
</element>
```



```

    </complexType>
  /element>
<element name="ORU_R01.GROUP.5">
  <complexType>
    <sequence>
      <element minOccurs="1" maxOccurs="1" ref="PV1" />
      <element minOccurs="0" maxOccurs="1" ref="PV2" />
    </sequence>
  </complexType>
</element>
<!-- .. message definition ORU_R01 -->
<element name="ORU_R01">
  <complexType>
    <sequence>
      <element minOccurs="1" maxOccurs="1" ref="MSH" />
      <element minOccurs="1" maxOccurs="unbounded" ref="ORU_R01.GROUP.4" />
      <element minOccurs="0" maxOccurs="1" ref="DSC" />
    </sequence>
  </complexType>
</element>
</schema>

```

---

This section from the schema file defines the message type ORU of event R01. There are numerous groups and sub-groups, which detail the sub-sections of the message. Some of these sub-sections are required, for example, ORU\_R01.GROUP.4, and others are allowed to occur numerous times, for example, ORU\_R01.GROUP.2.

# Segments.xsd

The following schema describes all the fields that make up each of the segments used in message ORU of event R01.

## Listing A-2 Segments.xsd

---

```
<?xml version = "1.0" encoding = "ISO-8859-1" ?>
<schema>

<!-- SEGMENT MSH -->

<element name="MSH">
  <complexType>
    <sequence>
      <element minOccurs="1" maxOccurs="1" ref="MSH.FIELD_SEP" />
      <element minOccurs="1" maxOccurs="1" ref="MSH.ENCDNG_CHRS" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.SND_APP" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.SND_FAC" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.RCV_APP" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.RCV_FAC" />
      <element minOccurs="1" maxOccurs="1" ref="MSH.MSG_DATETIME" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.SECURITY" />
      <element minOccurs="1" maxOccurs="1" ref="MSH.MSG_TYPE" />
      <element minOccurs="1" maxOccurs="1" ref="MSH.MSG_CNTRL_ID" />
      <element minOccurs="1" maxOccurs="1" ref="MSH.PRCNG_ID" />
      <element minOccurs="1" maxOccurs="1" ref="MSH.VRSN_ID" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.SQNC_NM" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.CNTN_PNTR" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.ACCEPT_ACK_TYP" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.APP_ACK_TYP" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.CNTRY_CDE" />
      <element minOccurs="0" maxOccurs="unbounded" ref="MSH.CHAR_SET" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.MSG_LANG" />
      <element minOccurs="0" maxOccurs="1" ref="MSH.ALT_CHAR_SET" />
    </sequence>
  </complexType>
</element>

<!-- SEGMENT PID -->

<!-- Patient Identificaion segment -->

<element name="PID">
  <complexType>
    <sequence>
      <element minOccurs="0" maxOccurs="1" ref="PID.SET_ID" />
    </sequence>
  </complexType>
</element>
```

```

<element minOccurs="0" maxOccurs="1" ref="PID.PATNT_ID" />
<element minOccurs="1" maxOccurs="unbounded" ref="PID.PATNT_ID_LST" />
<element minOccurs="0" maxOccurs="unbounded" ref="PID.ALT_PATNT_ID" />
<element minOccurs="1" maxOccurs="unbounded" ref="PID.PATNT_NAME" />
<element minOccurs="0" maxOccurs="unbounded" ref="PID.MTHR_MDN_NME" />
<element minOccurs="0" maxOccurs="1" ref="PID.DOB" />
<element minOccurs="0" maxOccurs="1" ref="PID.SEX" />
<element minOccurs="0" maxOccurs="unbounded" ref="PID.ALIAS" />
<element minOccurs="0" maxOccurs="unbounded" ref="PID.RACE" />
<element minOccurs="0" maxOccurs="unbounded" ref="PID.PATNT_ADDRSS" />
<element minOccurs="0" maxOccurs="1" ref="PID.COUNTY_CDE" />
<element minOccurs="0" maxOccurs="unbounded" ref="PID.PHNE_HME" />
<element minOccurs="0" maxOccurs="unbounded" ref="PID.PHNE_BUS" />
<element minOccurs="0" maxOccurs="1" ref="PID.PRMRY_LANG" />
<element minOccurs="0" maxOccurs="1" ref="PID.MRTL_STS" />
<element minOccurs="0" maxOccurs="1" ref="PID.RLGN" />
<element minOccurs="0" maxOccurs="1" ref="PID.PATNT_ACC_NM" />
<element minOccurs="0" maxOccurs="1" ref="PID.SSN_NM" />
<element minOccurs="0" maxOccurs="1" ref="PID.DVR_LCNS_NM" />
<element minOccurs="0" maxOccurs="unbounded" ref="PID.MTHR_ID" />
<element minOccurs="0" maxOccurs="unbounded" ref="PID.ETHNIC_GRP" />
<element minOccurs="0" maxOccurs="1" ref="PID.BRTH_PLG" />
<element minOccurs="0" maxOccurs="1" ref="PID.MLTPL_BRTH_IND" />
<element minOccurs="0" maxOccurs="1" ref="PID.BRTH_ORDR" />
<element minOccurs="0" maxOccurs="unbounded" ref="PID.CTZNSHP" />
<element minOccurs="0" maxOccurs="1" ref="PID.VTRNS_MIL_STS" />
<element minOccurs="0" maxOccurs="1" ref="PID.NTNLTY" />
<element minOccurs="0" maxOccurs="1" ref="PID.PATNT_DTH_DATETIME" />
<element minOccurs="0" maxOccurs="1" ref="PID.PATNT_DTH_IND" />
</sequence>
</complexType>
</element>

<!-- SEGMENT PD1 -->

<!-- Patient Additional Demographic segment -->

<element name="PD1">
  <complexType>
    <sequence>
      <element minOccurs="0" maxOccurs="unbounded" ref="PD1.LVNG_DPNDY" />
      <element minOccurs="0" maxOccurs="1" ref="PD1.LVNG_ARRNGMNT" />
      <element minOccurs="0" maxOccurs="unbounded" ref="PD1.PATNT_PRM_FAC" />
      <element minOccurs="0" maxOccurs="unbounded" ref="PD1.PATNT_PRM_CARE_PRV" />
    </sequence>
  </complexType>
</element>

<element minOccurs="0" maxOccurs="1" ref="PD1.STDNT_IND" />
<element minOccurs="0" maxOccurs="1" ref="PD1.HANDICAP" />
<element minOccurs="0" maxOccurs="1" ref="PD1.LVNG_WILL" />
<element minOccurs="0" maxOccurs="1" ref="PD1.ORG_NDR" />

```

```

    <element minOccurs="0" maxOccurs="1" ref="PD1.SEPARATE_BILL" />
    <element minOccurs="0" maxOccurs="unbounded" ref="PD1.DUP_PATNT" />
    <element minOccurs="0" maxOccurs="1" ref="PD1.PBLCTY_CDE" />
    <element minOccurs="0" maxOccurs="1" ref="PD1.PRTCTN_IND" />
  </sequence>
</complexType>
</element>

<!-- SEGMENT NK1 -->

<!-- Next of kin / associated parties segment -->

<element name="NK1">
  <complexType>
    <sequence>
      <element minOccurs="1" maxOccurs="1" ref="NK1.SET_ID" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.NME" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.RLTNSHP" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.ADDRSS" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.PHNE_NM" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.BUS_PHNE_NM" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.CNTCT_RLE" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.STRT_DTE" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.END_DTE" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.KIN_JOB_TITLE" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.KIN_JOB_CDE" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.KIN_EMP_NM" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.ORG_NME" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.MRTL_STS" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.SEX" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.DOB" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.LVNG_DPNDCY" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.AMBLTRY_STS" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.CTZNSHP" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.PRM_LANG" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.LVNG_ARNGMNT" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.PBLCTY_CDE" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.PRTCTN_IND" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.STDNT_IND" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.RLGN" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.MOTH_MDN_NME" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.NTNLTY" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.ETHNC_GRP" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.CNTCT_RSN" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.CNTCT_PRSN_NME" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.CNTCT_PRSN_NUM" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.CNTCT_PRSN_ADD" />
      <element minOccurs="0" maxOccurs="unbounded" ref="NK1.KIN_ID" />
      <element minOccurs="0" maxOccurs="1" ref="NK1.JOB_STS" />
    </sequence>
  </complexType>
</element>

```

```

        <element minOccurs="0" maxOccurs="unbounded" ref="NK1.RACE" />
        <element minOccurs="0" maxOccurs="1" ref="NK1.HANDICAP" />
        <element minOccurs="0" maxOccurs="1" ref="NK1.CNTCT_PRSN_SSN" />
    </sequence>
</complexType>
</element>

<!-- SEGMENT NTE -->

<!-- Notes and comments segment -->

<element name="NTE">
    <complexType>
        <sequence>
            <element minOccurs="0" maxOccurs="1" ref="NTE.SET_ID" />
            <element minOccurs="0" maxOccurs="1" ref="NTE.SRC" />
            <element minOccurs="0" maxOccurs="unbounded" ref="NTE.CMNT" />
            <element minOccurs="0" maxOccurs="1" ref="NTE.CMNT_TYP" />
        </sequence>
    </complexType>
</element>

<!-- SEGMENT PV1 -->

<!-- Patient visit segment -->

<element name="PV1">
    <complexType>
        <sequence>
            <element minOccurs="0" maxOccurs="1" ref="PV1.SET_ID" />
            <element minOccurs="1" maxOccurs="1" ref="PV1.PATNT_CLSS" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.ASGND_PATNT_LCTN" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.ADSMN_TYP" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.PREADMT_NUM" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.PRIOR_PATNT_LOC" />
            <element minOccurs="0" maxOccurs="unbounded" ref="PV1.ATNDNG_DCTR" />
            <element minOccurs="0" maxOccurs="unbounded" ref="PV1.RFRNG_DCTR" />
            <element minOccurs="0" maxOccurs="unbounded" ref="PV1.CNSLTNG_DCTR" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.HSPTL_SRVCE" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.TMP_LOC" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.PREADMIT_TST_IND" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.READMSSN_IND" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.ADMNT_SRC" />
            <element minOccurs="0" maxOccurs="unbounded" ref="PV1.AMBLTRY_STS" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.VIP_IND" />
            <element minOccurs="0" maxOccurs="unbounded" ref="PV1.ADMTTNG_DCTR" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.PATNT_TYP" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.VST_NUM" />
            <element minOccurs="0" maxOccurs="unbounded" ref="PV1.FNCL_CLSS" />
            <element minOccurs="0" maxOccurs="1" ref="PV1.CHRG_PRC_IND" />
        </sequence>
    </complexType>
</element>

```

```

<element minOccurs="0" maxOccurs="1" ref="PV1.CRTSY_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV1.CRDT_RTNG" />
<element minOccurs="0" maxOccurs="unbounded" ref="PV1.CNTRCT_CODE" />
<element minOccurs="0" maxOccurs="unbounded" ref="PV1.CNTRCT_EFFCTV_DTE"
/>
<element minOccurs="0" maxOccurs="unbounded" ref="PV1.CNTRCT_AMMNT" />
<element minOccurs="0" maxOccurs="unbounded" ref="PV1.CNTRCT_PRD" />
<element minOccurs="0" maxOccurs="1" ref="PV1.INTRST_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV1.TRNSFR_BAD_DEBT_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV1.TRNSFR_BAD_DEBT_DTE" />
<element minOccurs="0" maxOccurs="1" ref="PV1.BAD_DEBT_AGENCY_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV1.BAD_DEBT_TRNSFR_AMNT" />
<element minOccurs="0" maxOccurs="1" ref="PV1.BAD_DEBT_RCVRY_AMNT" />
<element minOccurs="0" maxOccurs="1" ref="PV1.DLT_ACCNT_IND" />
<element minOccurs="0" maxOccurs="1" ref="PV1.DLT_ACCNT_DTE" />
<element minOccurs="0" maxOccurs="1" ref="PV1.DSCHRG_DSPSTN" />
<element minOccurs="0" maxOccurs="1" ref="PV1.DSCHRG_LOC" />
<element minOccurs="0" maxOccurs="1" ref="PV1.DIET_TYP" />
<element minOccurs="0" maxOccurs="1" ref="PV1.SRVCNG_FAC" />
<element minOccurs="0" maxOccurs="1" ref="PV1.BED_STS" />
<element minOccurs="0" maxOccurs="1" ref="PV1.ACCNT_STS" />
<element minOccurs="0" maxOccurs="1" ref="PV1.PNDNG_LOC" />
<element minOccurs="0" maxOccurs="1" ref="PV1.PRIOR_TMP_LOC" />
<element minOccurs="0" maxOccurs="1" ref="PV1.ADMT_DTE" />
<element minOccurs="0" maxOccurs="unbounded" ref="PV1.DSCHRG_DTE" />
<element minOccurs="0" maxOccurs="1" ref="PV1.CRRNT_PATNT_BLNC" />
<element minOccurs="0" maxOccurs="1" ref="PV1.TOT_CHRGS" />
<element minOccurs="0" maxOccurs="1" ref="PV1.TOT_ADJSMNTS" />
<element minOccurs="0" maxOccurs="1" ref="PV1.TOT_PYMNTS" />
<element minOccurs="0" maxOccurs="1" ref="PV1.ALTRNT_VST_ID" />
<element minOccurs="0" maxOccurs="1" ref="PV1.VST_IND" />
<element minOccurs="0" maxOccurs="unbounded" ref="PV1.OTHR_HLTHCR_PRVDR"
/>
</sequence>
</complexType>
</element>
<!-- SEGMENT PV2 -->
<!--atient visit additional information segment -->
<element name="PV2">
<complexType>
<sequence>
<element minOccurs="0" maxOccurs="1" ref="PV2.PRIOR_PNDNG_LOC" />
<element minOccurs="0" maxOccurs="1" ref="PV2.ACCMMDTN_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.ADMT_RSN" />
<element minOccurs="0" maxOccurs="1" ref="PV2.TRNSFR_RSN" />
<element minOccurs="0" maxOccurs="unbounded" ref="PV2.PATNT_VAL" />

```

```

<element minOccurs="0" maxOccurs="1" ref="PV2.PATNT_VAL_LOC" />
<element minOccurs="0" maxOccurs="unbounded" ref="PV2.VST_USR_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.EXPCTD_ADMT_DATETIME" />
<element minOccurs="0" maxOccurs="1" ref="PV2.EXPCTD_DSCHRG_DATETIME" />
<element minOccurs="0" maxOccurs="1" ref="PV2.ESTMTD_LNGTH_INPATNT_STAY"
/>
<element minOccurs="0" maxOccurs="1" ref="PV2.ACTL_LNGTH_INPATNT_STAY" />
<element minOccurs="0" maxOccurs="1" ref="PV2.VST_DSCRPTN" />
<element minOccurs="0" maxOccurs="unbounded" ref="PV2.RFRRL_SRC_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.PRVS_SRVC_DTE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.EMPLYMNT_ILLNSS_RLTD_IND" />
<element minOccurs="0" maxOccurs="1" ref="PV2.PRG_STS_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.PRG_STS_DTE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.SPCL_PRGM_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.RTNTN_IND" />
<element minOccurs="0" maxOccurs="1" ref="PV2.EXPCTD_NUM_INSRNC_PLNS" />
<element minOccurs="0" maxOccurs="1" ref="PV2.VST_PBLCTY_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.VST_PRTCTN_IND" />
<element minOccurs="0" maxOccurs="unbounded" ref="PV2.CLNC_ORG_NAME" />
<element minOccurs="0" maxOccurs="1" ref="PV2.PATNT_STS_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.VST_PRTY_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.PRVS_TRTMNT_DTE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.EXPCTD_DSCHRG_DSPSTN" />
<element minOccurs="0" maxOccurs="1" ref="PV2.SGNTRE_ON_FILE_DTE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.FRST_SMLR_ILLNSS_DTE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.PATNT_CHRGE_ADJSTMNT_CODE"
/>
<element minOccurs="0" maxOccurs="1" ref="PV2.RCRRNG_SRVCE_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.BLLNG_MEDIA_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.EXPCTD_SRGRY_DATETIME" />
<element minOccurs="0" maxOccurs="1" ref="PV2.MLTRY_PRTNRSHP_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.MLTRY_NON_AVLBLTY_CODE" />
<element minOccurs="0" maxOccurs="1" ref="PV2.NWBRN_BABY_IND" />
<element minOccurs="0" maxOccurs="1" ref="PV2.BABY_DTND_IND" />
</sequence>
</complexType>
</element>

<!-- SEGMENT ORC -->

<!-- Common Order segment -->

<element name="ORC">
  <complexType>
    <sequence>
      <element minOccurs="0" maxOccurs="1" ref="ORC.ORDER_CNTRL" />
      <element minOccurs="0" maxOccurs="1" ref="ORC.PLCR_ORDR_NUM" />
      <element minOccurs="0" maxOccurs="1" ref="ORC.FLLR_ORDR_NUM" />
      <element minOccurs="0" maxOccurs="1" ref="ORC.PLCR_GRP_NUM" />
    </sequence>
  </complexType>
</element>

```

```

<element minOccurs="0" maxOccurs="1" ref="ORC.ORDER_STS" />
<element minOccurs="0" maxOccurs="1" ref="ORC.RSPNS_FLG" />
<element minOccurs="0" maxOccurs="1" ref="ORC.QNTY_TMNG" />
<element minOccurs="0" maxOccurs="1" ref="ORC.PARENT" />
<element minOccurs="0" maxOccurs="1" ref="ORC.XN_DATETIME" />
<element minOccurs="0" maxOccurs="unbounded" ref="ORC.ENTRD_BY" />
<element minOccurs="0" maxOccurs="unbounded" ref="ORC.VRFD_BY" />
<element minOccurs="0" maxOccurs="unbounded" ref="ORC.ORDERNG_PRVDR" />
<element minOccurs="0" maxOccurs="1" ref="ORC.ENTRS_LOC" />
<element minOccurs="0" maxOccurs="unbounded" ref="ORC.14" />
<element minOccurs="0" maxOccurs="1" ref="ORC.CLL_BCK_PHNE_NUM" />
<element minOccurs="0" maxOccurs="1" ref="ORC.ORDER_EFF_DATETIME" />
<element minOccurs="0" maxOccurs="1" ref="ORC.ORDER_CNTRL_CODE_RSN" />
<element minOccurs="0" maxOccurs="1" ref="ORC.ENTRNG_ORG" />
<element minOccurs="0" maxOccurs="unbounded" ref="ORC.ENTRNG_DVCE" />
<element minOccurs="0" maxOccurs="1" ref="ORC.ADNVCD_BNFCRY_NTCE_CODE" />
/sequence>
</complexType>
</element>

<!-- SEGMENT OBR -->

<!-- Observation request segment -->

<element name="OBR">
  <complexType>
    <sequence>
      <element minOccurs="0" maxOccurs="1" ref="OBR.SET_ID" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.PLCR_ORDER_NUM" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.FLLR_ORDER_NUM" />
      <element minOccurs="1" maxOccurs="1" ref="OBR.UNVRSL_SRVC_ID" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.PRIORITY" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.RQSTD_DATETIME" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.OBSRVTN_DATETIME" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.OBSRVTN_END_DATETIME" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.CLLCTN_VLME" />
      <element minOccurs="0" maxOccurs="unbounded" ref="OBR.CLLCTN_ID" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.SPCMN_ACTN_CODE" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.DNGR_CODE" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.RLVNT_CLNCL_INF" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.SPCMEN_RCVD_DATETIME" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.SPCMEN_SRC" />
      <element minOccurs="0" maxOccurs="unbounded" ref="OBR.ORDERNG_PRVDR" />
      <element minOccurs="0" maxOccurs="unbounded"
        ref="OBR.ORDER_CLLBCK_PHNE_NUM" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.PLCR_FLD_1" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.PLCR_FLD_2" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.FLLR_FLD_1" />
      <element minOccurs="0" maxOccurs="1" ref="OBR.FLLR_FLD_2" />
    </sequence>
  </complexType>
</element>

```



```

<element minOccurs="0" maxOccurs="1" ref="OBR.RPRT_DATETIME" />
<element minOccurs="0" maxOccurs="1" ref="OBR.CHRG_TO_PRCTCE" />
<element minOccurs="0" maxOccurs="1" ref="OBR.DGNSTC_SRV_SCT_ID" />
<element minOccurs="0" maxOccurs="1" ref="OBR.RSLT_STS" />
<element minOccurs="0" maxOccurs="1" ref="OBR.PRNT_RSLT" />
<element minOccurs="0" maxOccurs="unbounded" ref="OBR.QNTY_TMNG" />
<element minOccurs="0" maxOccurs="unbounded" ref="OBR.RSLT_COPIES_TO" />
<element minOccurs="0" maxOccurs="1" ref="OBR.PRNT" />
<element minOccurs="0" maxOccurs="1" ref="OBR.TRNSPRTN_MDE" />
<element minOccurs="0" maxOccurs="unbounded" ref="OBR.RSN_FOR_STDY" />
<element minOccurs="0" maxOccurs="1" ref="OBR.PRNCPL_RSLT_INTRPRTR" />
<element minOccurs="0" maxOccurs="unbounded"
      ref="OBR.ASSTNT_RSLT_INTRPRTR" />
<element minOccurs="0" maxOccurs="unbounded" ref="OBR.TCHNCN" />
<element minOccurs="0" maxOccurs="unbounded" ref="OBR.TRNSCRPTNST" />
<element minOccurs="0" maxOccurs="1" ref="OBR.SCHDLN_DATETIME" />
<element minOccurs="0" maxOccurs="1" ref="OBR.NUM_SMPL_CNTNRS" />
<element minOccurs="0" maxOccurs="unbounded" ref="OBR.TRNSPRT_LGSTCS" />
<element minOccurs="0" maxOccurs="unbounded" ref="OBR.CLLCTRS_CMMNT" />
<element minOccurs="0" maxOccurs="1" ref="OBR.TRNSPRT_ARRNGMNT_RSPNSBLTY"
      />
<element minOccurs="0" maxOccurs="1" ref="OBR.TRNSPRT_ARRNGD" />
<element minOccurs="0" maxOccurs="1" ref="OBR.ESCRT_RQRD" />
<element minOccurs="0" maxOccurs="unbounded"
      ref="OBR.PLNND_PATNT_TRNSPRT_CMMNT" />
</sequence>
</complexType>
</element>

<!-- SEGMENT OBX -->

<!-- Observation/result segment -->

<element name="OBX">
  <complexType>
    <sequence>
      <element minOccurs="0" maxOccurs="1" ref="OBX.SET_ID" />
      <element minOccurs="1" maxOccurs="1" ref="OBX.VALUE_TYP" />
      <element minOccurs="1" maxOccurs="1" ref="OBX.OBSRVTN_ID" />
      <element minOccurs="0" maxOccurs="1" ref="OBX.OBSRVTN_SUB_ID" />
      <element minOccurs="1" maxOccurs="1" ref="OBX.OBSRVTN_VALUE" />
      <element minOccurs="0" maxOccurs="1" ref="OBX.UNITS" />
      <element minOccurs="0" maxOccurs="1" ref="OBX.RFRNCS_RNG" />
      <element minOccurs="0" maxOccurs="1" ref="OBX.ABNRML_FLGS" />
      <element minOccurs="0" maxOccurs="unbounded" ref="OBX.PRBLTY" />
      <element minOccurs="0" maxOccurs="1" ref="OBX.NATURE_OF_ABNRML_TST" />
      <element minOccurs="1" maxOccurs="1" ref="OBX.OBSRV_RSLT_STS" />
      <element minOccurs="0" maxOccurs="1" ref="OBX.DATE_LST_OBS_NRML_VAL" />
      <element minOccurs="0" maxOccurs="1" ref="OBX.USR_DFND_ACCSS_CHK" />
    </sequence>
  </complexType>
</element>

```

```

        <element minOccurs="0" maxOccurs="1" ref="OBX.OBSV_DATETIME" />
        <element minOccurs="0" maxOccurs="1" ref="OBX.PRCERS_ID" />
        <element minOccurs="0" maxOccurs="1" ref="OBX.RSPNSBLE_OBSRVR" />
        <element minOccurs="0" maxOccurs="unbounded" ref="OBX.OBSRVTN_MTHD" />
    </sequence>
</complexType>
</element>

<!-- SEGMENT CTI -->

<element name="CTI">
    <complexType>
        <sequence>
            <element minOccurs="1" maxOccurs="1" ref="CTI.SPNSR_STDY_ID" />
            <element minOccurs="0" maxOccurs="1" ref="CTI.STDY_PHSE_ID" />
            <element minOccurs="0" maxOccurs="1" ref="CTI.STDY_SCHDLT_TIME_PNT" />
        </sequence>
    </complexType>
</element>

<!-- SEGMENT DSC -->

<element name="DSC">
    <complexType>
        <sequence>
            <element minOccurs="0" maxOccurs="1" ref="DSC.CNTNTN_PNTR" />
        </sequence>
    </complexType>
</element>
</schema>

```

---

## Field Definitions

The field definitions file, `FIELDS.xsd`, defines field definitions. The field definition includes a long name (descriptive definition) and a reference to the data type. For more information about the data type definition, see [“Data Type Definitions” on page A-26](#).

### Listing A-3 Field Definitions

---

```

<?xml version="1.0" encoding="ISO-8859-1"?>
<schema>
    <ACC_DATE_TIME longName="Date Time" type="TS"/>
    <ACC_CODE longName="Code" type="CE"/>
    <ACC_LOCATION longName="Location Time" type="ST"/>

```

```

<ACC_AUTO_STATE longName="State Auto Accident occurred in" type="CE"/>
<ACC_JOB_IND longName="Job Accident Indicator" type="ID"/>
<ACC_DEATH_IND longName="Death Indicator" type="ID"/>
<AL1_ID longName="ID" type="SI"/>
<AL1_ALLERGEN_TYPE longName="Allergen Type Code" type="IS"/>
<AL1_ALLERGEN_DESC longName="Allergen Code Description" type="CE"/>
<AL1_ALLERGY_SEVERITY longName="Allergy severity code" type="IS"/>
<AL1_ALLERGY_REACTION longName="Allergy Reacation code" type="ST"/>
<AL1_ID_DATE longName="Identification Date" type="DT"/>
<DB1_ID longName="ID" type="SI"/>
<DB1_PERSON_CODE longName="Disabled Person Code" type="IS"/>
<DB1_PERSON_ID longName="Disabled Person Identifier" type="CX"/>
<DB1_INDICATOR longName="Disability Indicator" type="ID"/>
<DB1_START_DATE longName="Disability Start Date" type="DT"/>
<DB1_END_DATE longName="Disability End Date" type="DT"/>
<DB1_RETURN_WORK longName="Disability Return to Work Date" type="DT"/>
<DB1_UNABLE_WORK longName="Disability Unable to Work Date" type="DT"/>
<DG1_ID longName="ID" type="SI"/>
<DG1_CODE_METHOD longName="Diagnosis Coding Method" type="ID"/>
<DG1_CODE longName="Diagnosis Code" type="CE"/>
<DG1_DESC longName="Diagnosis Description" type="ST"/>
<DG1_DATE longName="Diagnosis Date Time" type="TS"/>
<DG1_TYPE longName="Diagnosis Type" type="IS"/>
<DG1_MAJOR_CAT longName="Major diagnosis category" type="CE"/>
<DG1_RELATED_GROUP longName="Diagnostic Related Group" type="CE"/>
<DG1_DRG_APP_IND longName="DRG Approval Indicator" type="ID"/>
<DG1_DRG_GRP_REV_CODE longName="DRG Grouper Review code" type="IS"/>
<DG1_OUTLIER_TYPE longName="Outlier Type" type="CE"/>
<DG1_OUTLIER_DAYS longName="Outlier Days" type="NM"/>
<DG1_OUTLIER_COST longName="Outlier Cost" type="CP"/>
<DG1_GRP_VER_TYPE longName="Grouper Version and Type" type="ST"/>
<DG1_PRIORITY longName="Diagnosis Priority" type="ID"/>
<DG1_CLINICIAN longName="Diagnosing Clinician" type="XCN"/>
<DG1_CLASS longName="Diagnosis Classification" type="IS"/>
<DG1_CONFID_IND longName="Confidential Indicator" type="ID"/>
<DG1_ATTESTATION_DATE longName="Attestation DateTime" type="TS"/>
<DRG_RELATED_GROUP longName="Diagnostic Related Group" type="CE"/>
<DRG_ASSIGNED_DATE longName="DRG Assigned Date Time" type="TS"/>
<DRG_APP_IND longName="DRG Approval Indicator" type="ID"/>
<DRG_GRP_REV_CODE longName="DRG Grouper Review Code" type="IS"/>
<DRG_OUTLIER_TYPE longName="Outlier Type" type="CE"/>
<DRG_OUTLIER_DAYS longName="Outlier Days" type="NM"/>
<DRG_OUTLIER_COST longName="Outlier Cost" type="CP"/>
<DRG_PAYOR longName="DRG Payor" type="IS"/>
<DRG_OUTLIER_REIMBUR longName="Outlier Reimbursement" type="CP"/>
<DRG_CONFID_IND longName="Confidential Indicator" type="ID"/>
<EVN_TYPE_CODE longName="Event Type Code" type="ID"/>
<EVN_RECORD_DATE longName="Recorded Date Time" type="TS"/>
<EVN_DATE_PLANNED_EVN longName="Date Time Planned Event" type="TS"/>

```

```

<EVN_REASON_CODE longName="Event Reason Code" type="IS"/>
<EVN_OP_ID longName="Operator ID" type="XCN"/>
<EVN_OCCURRED longName="Event Occurred" type="TS"/>
<GT1_ID longName="ID" type="SI"/>
<GT1_NUMBER longName="Guarantor Number" type="CX"/>
<GT1_NAME longName="Guarantor Name" type="XPN"/>
<GT1_SPOUSE_NAME longName="Guarantor Spouse Name" type="XPN"/>
<GT1_ADDRESS longName="Guarantor Address" type="XAD"/>
<GT1_PHONE_HOME longName="Guarantor Phone number Home" type="XTN"/>
<GT1_PHONE_BUSINESS longName="Guarantor Phone number business" type="XTN"/>
<GT1_DOB longName="Guarantor Date Time of Birth" type="TS"/>
<GT1_ADMIN_SEX longName="Guarantor Administrative sex" type="IS"/>
<GT1_TYPE longName="Guarantor type" type="IS"/>
<GT1_RELATIONSHIP longName="Guarantor relationship" type="CE"/>
<GT1_SSN longName="Guarantor SSN" type="ST"/>
<GT1_DATE_BEGIN longName="Guarantor Date Begin" type="DT"/>
<GT1_DATE_END longName="Guarantor Date End" type="DT"/>
<GT1_PRIORITY longName="Guarantor Priority" type="NM"/>
<GT1_EMPLOYER_NAME longName="Guarantor Employer Name" type="XPN"/>
<GT1_EMPLOYER_ADD longName="Guarantor Employer Address" type="XAD"/>
<GT1_EMPLOYER_PHONE longName="Guarantor Employer Phone" type="XTN"/>
<GT1_EMPLOYEE_ID longName="Guarantor Employee ID" type="CX"/>
<GT1_EMPLOYMENT_STATUS longName="Guarantor Employment Status" type="IS"/>
<GT1_ORG_NAME longName="Guarantor Organization Name" type="XON"/>
<GT1_BILL_HOLD_FLG longName="Guarantor Billing Hold Flag" type="ID"/>
<GT1_CREDIT_RATING longName="Guarantor Credit Rating Code" type="CE"/>
<GT1_DEATH_DATE longName="Guarantor Death Date and Time" type="TS"/>
<GT1_DEATH_FLG longName="Guarantor Death Flag" type="ID"/>
<GT1_CHARGE_ADJ longName="Guarantor Charge Adjustment Code" type="CE"/>
<GT1_HOUSEHOLD_INCOME longName="Guarantor Household annual income" type="CP"/>
<GT1_HOUSEHOLD_SIZE longName="Guarantor Household size" type="NM"/>
<GT1_EMPLOYER_ID longName="Guarantor Employer ID Number" type="CX"/>
<GT1_MARITAL_STATUS longName="Guarantor Marital Status code" type="CE"/>
<GT1_HIRE_EFF_DATE longName="Guarantor Hire Effective Date" type="DT"/>
<GT1_EMPLOY_STOP_DATE longName="Employment Stop Date" type="DT"/>
<GT1_LIVING_DEPEND longName="Living Dependency" type="IS"/>
<GT1_AMBULATORY_STAT longName="Ambulatory Status" type="IS"/>
<GT1_CITIZEN longName="Citizenship" type="CE"/>
<GT1_PRIMARY_LANG longName="Primary Language" type="CE"/>
<GT1_LIVING_ARRANG longName="Living Arrangement" type="IS"/>
<GT1_PUB_CODE longName="Publicity Code" type="CE"/>
<GT1_PROTECT_IND longName="Protection Indicator" type="ID"/>
<GT1_STUDENT_IND longName="Student Indicator" type="IS"/>
<GT1_RELIGION longName="Religion" type="CE"/>
<GT1_MOTHER_MAIDEN_NAME longName="Mother Maiden Name" type="XPN"/>
<GT1_NATIONALITY longName="Nationality" type="CE"/>
<GT1_ETHNIC_GROUP longName="Ethnic Group" type="CE"/>
<GT1_CONTACT_NAME longName="Contact Persons Name" type="XPN"/>
<GT1_CONTACT_PHONE longName="Contact Persons Phone number" type="XTN"/>

```

```

<GT1_CONTACT_REASON longName="Contact Reason" type="CE"/>
<GT1_CONTACT_RELATION longName="Contact relationship" type="IS"/>
<GT1_JOB_TITLE longName="Job title" type="ST"/>
<GT1_JOB_CODE longName="Job code" type="JCC"/>
<GT1_EMP_ORG_NAME longName="Guarantor Employers Organization Name"
  type="XON"/>
<GT1_HANDICAP longName="Handicap" type="IS"/>
<GT1_JOB_STATUS longName="Job Status" type="IS"/>
<GT1_FIN_CLASS longName="Guarantor Financial Class" type="FC"/>
<GT1_RACE longName="Guarantor Race" type="CE"/>
<IN1_ID longName="ID" type="SI"/>
<IN1_PLAN_ID longName="Insurance Plan ID" type="CE"/>
<IN1_COMPANY_ID longName="Insurance Company ID" type="CX"/>
<IN1_COMPANY_NAME longName="Insurance Company Name" type="XON"/>
<IN1_COMPANY_ADD longName="Insurance Company Address" type="XAD"/>
<IN1_COMPANY_CONTACT longName="Insurance Company Contact" type="XPN"/>
<IN1_COMPANY_CONTACT_TEL longName="Insurance Company Tel No" type="XTN"/>
<IN1_GROUP_NUMBER longName="Group Number" type="ST"/>
<IN1_GROUP_NAME longName="Group Name" type="XON"/>
<IN1_GROUP_EMP_ID longName="Insured Group Emp Id" type="CX"/>
<IN1_GROUP_EMP_NAME longName="Insured Group Emp Name" type="XON"/>
<IN1_PLAN_EFF_DATE longName="Plan Effective Date" type="DT"/>
<IN1_PLAN_EXP_DATE longName="Plan Expiration Date" type="DT"/>
<IN1_AUTH_INFO longName="Authorization Information" type="CM_AI"/>
<IN1_PLAN_TYPE longName="Plan Type" type="IS"/>
<IN1_NAME_INSURED longName="Name of Insured" type="XPN"/>
<IN1_INSURED_RELATION longName="Insured relationship to Patient" type="CE"/>
<IN1_INSURED_DOB longName="Insured Date Of Birth" type="TS"/>
<IN1_INSURED_ADD longName="Insured Address" type="XAD"/>
<IN1_ASSIGN_BENEFIT longName="Assignment of Benefits" type="IS"/>
<IN1_COORD_BENEFIT longName="Coordination of Benefits" type="IS"/>
<IN1_COORD_BENEFIT_PRIOR longName="Coord of Benefits priority" type="ST"/>
<IN1_NOTICE_ADMIS_FLG longName="Notice of Admission Flag" type="ID"/>
<IN1_NOTICE_ADMIS_DATE longName="Notice of Admission Date" type="DT"/>
<IN1_REP_ELIG_FLG longName="Report of Eligibility Flag" type="ID"/>
<IN1_REP_ELIG_DATE longName="Report of Eligibility Date" type="DT"/>
<IN1_RELEASE_INFO_CODE longName="Release Information Code" type="IS"/>
<IN1_PREADMIT_CERT longName="PreAdmit Certificate" type="ST"/>
<IN1_VERIFICATION_DATE longName="Verification Date Time" type="TS"/>
<IN1_VERIFICATION_BY longName="Verificaion By" type="XCN"/>
<IN1_TYPE_AGREE_CODE longName="Type of Agreement code" type="IS"/>
<IN1 BILLING_STATUS longName="Billing Status" type="IS"/>
<IN1_LIFETIME_RESERVE_DAYS longName="Lifetime Reserve Days" type="NM"/>
<IN1_DELAY_BEFORE_LR_DAY longName="Delay Before LR Days" type="NM"/>
<IN1_COMPANY_PLAN_CODE longName="Company Plan Code" type="IS"/>
<IN1_POLICY_NUMBER longName="Policy Number" type="ST"/>
<IN1_POLICY_DEDUCT longName="Policy Deductible" type="CP"/>
<IN1_POLICY_LIMIT_AMT longName="Policy Limit Amount" type="CP"/>
<IN1_POLICY_LIMIT_DAYS longName="Policy Limit Days" type="NM"/>

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<IN1_ROOM_RATE_SEMI_PRIV longName="Room Rate Semi private" type="CP"/>
<IN1_ROOM_RATE_PRIV longName="Room Rate private" type="CP"/>
<IN1_INSURED_EMPLOY_STAT longName="Insured Employment Status" type="CE"/>
<IN1_INSURED_ADMIN_SEX longName="Insured Administrative Sex" type="IS"/>
<IN1_INSURED_EMPLOYER_ADD longName="Insured Employers Address" type="XAD"/>
<IN1_VERIFICATION_STAT longName="Verification Status" type="ST"/>
<IN1_PRIOR_INS_PLAN longName="Prior Insurance Plan ID" type="IS"/>
<IN1_COVER_TYPE longName="Coverage Type" type="IS"/>
<IN1_HANDICAP longName="Handicap" type="IS"/>
<IN1_INSURED_ID longName="Insured ID Number" type="CX"/>
<IN2_EMPLOYEE_ID longName="Insureds Employee ID" type="CX"/>
<IN2_SSN longName="Insureds Social Security Number" type="ST"/>
<IN2_EMPLOYER_NAME longName="Insureds Employers Name and ID" type="XCN"/>
<IN2_EMPLOYER_INFO longName="Employer Information Data" type="IS"/>
<IN2_MAIL_CLAIM_PARTY longName="Mail Claim Party" type="IS"/>
<IN2_MEDICARE_CARD_NO longName="Medicare Health Ins Card Number" type="ST"/>
<IN2_MEDICAID_CASE_NAME longName="Medicaid Case Name" type="XPN"/>
<IN2_MEDICAID_CASE_NUMBER longName="Medicaid Case Number" type="ST"/>
<IN2_MILITARY_SPONSOR longName="Military Sponsor Name" type="XPN"/>
<IN2_MILITARY_ID longName="Military ID Number" type="ST"/>
<IN2_DEP_MILITARY_RECIPIENT longName="Dependent Of Military Recipient"
type="CE"/>
<IN2_MILITARY_ORG longName="Military Organization" type="ST"/>
<IN2_MILITARY_STATION longName="Military Station" type="ST"/>
<IN2_MILITARY_SERVICE longName="Military Service" type="IS"/>
<IN2_MILITARY_RANK longName="Military Rank" type="IS"/>
<IN2_MILITARY_STATUS longName="Military Status" type="IS"/>
<IN2_MILITARY_RETIRE_DATE longName="Military Retire Date" type="DT"/>
<IN2_MILITARY_NON_AVAIL_COF longName="Military Non-Avail Cert On File"
type="ID"/>
<IN2_BABY_COVERAGE longName="Baby Coverage" type="ID"/>
<IN2_COMBINE_BABY_BILL longName="Combine Baby Bill" type="ID"/>
<IN2_BLOOD_DEUCT longName="Blood Deductible" type="ST"/>
<IN2_SPEC_COVER_APP_NAME longName="Special Coverage Approval Name"
type="XPN"/>
<IN2_SPEC_COVER_APP_TITLE longName="Special Coverage Approval Title"
type="ST"/>
<IN2_NON_COVER_INS_CODE longName="Non-Covered Insurance Code" type="IS"/>
<IN2_PAYOR_ID longName="Payor ID" type="CX"/>
<IN2_PAYOR_SUBSCRIBE_ID longName="Payor Subscriber ID" type="CX"/>
<IN2_ELIG_SOURCE longName="Eligibility Source" type="IS"/>
<IN2_ROOM_COVER_TYPE longName="Room Coverage Type Amount" type="CM_RMC"/>
<IN2_POLICY_TYPE longName="Policy Type Amount" type="CM_PTA"/>
<IN2_DAILY_DEDUCT longName="Daily Deductible" type="CM_DDI"/>
<IN2_LIVING_DEPEND longName="Living Dependency" type="IS"/>
<IN2_AMBULATORY_STATUS longName="Ambulatory Status" type="IS"/>
<IN2_CITIZEN longName="Citizenship" type="CE"/>
<IN2_PRIMARY_LANG longName="Primary Language" type="CE"/>
<IN2_LIVING_ARRANG longName="Living Arrangement" type="IS"/>

```

```

<IN2_PUB_CODE longName="Publicity Code" type="CE"/>
<IN2_PROTECT_IND longName="Protection Indicator" type="ID"/>
<IN2_STUDENT_IND longName="Student Indicator" type="IS"/>
<IN2_RELIGION longName="Religion" type="CE"/>
<IN2_MOTHER_MAIDEN_NAME longName="Mothers Maiden Name" type="XPN"/>
<IN2_NATIONALITY longName="Nationality" type="CE"/>
<IN2_ETHNIC_GROUP longName="Ethnic Group" type="CE"/>
<IN2_MARITAL_STATUS longName="Marital Status" type="CE"/>
<IN2_EMPLOY_START_DATE longName="Insureds Employment Start Date" type="DT"/>
<IN2_EMPLOY_STOP_DATE longName="Employment Stop Date" type="DT"/>
<IN2_JOB_TITLE longName="Job Title" type="ST"/>
<IN2_JOB_CODE longName="Job Code Class" type="JCC"/>
<IN2_JOB_STATUS longName="Job Status" type="IS"/>
<IN2_EMPLOYER_CONTACT_NAME longName="Employer Contact Person Name"
type="XPN"/>
<IN2_EMPLOYER_CONTACT_TEL longName="Employer Contact Person Phone Number"
type="XTN"/>
<IN2_EMPLOYER_CONTACT_REASON longName="Employer Contact Reason" type="IS"/>
<IN2_INSURED_CONTACT_NAME longName="Insureds Contact Persons Name"
type="XPN"/>
<IN2_INSURED_CONTACT_TEL longName="Insureds Contact Person Phone Number"
type="XTN"/>
<IN2_INSURED_CONTACT_REASON longName="Insureds Contact Person Reason"
type="IS"/>
<IN2_RELATION_START_DATE longName="Relationship To The Patient Start Date"
type="DT"/>
<IN2_RELATION_STOP_DATE longName="Relationship To The Patient Stop Date"
type="DT"/>
<IN2_INS_CONTACT_REASON longName="Insurance Co. Contact Reason" type="IS"/>
<IN2_INS_CONTACT_TEL longName="Insurance Co Contact Phone Number" type="XTN"/>
<IN2_POLICY_SCOPE longName="Policy Scope" type="IS"/>
<IN2_POLICY_SOURCE longName="Policy Source" type="IS"/>
<IN2_PATIENT_MEMBER_NO longName="Patient Member Number" type="CX"/>
<IN2_GUARANTOR_RELATION longName="Guarantors Relationship To Insured"
type="CE"/>
<IN2_INSURED_TEL longName="Insureds Phone Number - Home" type="XTN"/>
<IN2_INSURED_EMPLOYER_TEL longName="Insureds Employer Phone Number"
type="XTN"/>
<IN2_MILITARY_HANDICAP_PROG longName="Military Handicapped Program"
type="CE"/>
<IN2_SUSPEND_FLG longName="Suspend Flag" type="ID"/>
<IN2_COPAY_LIMIT_FLG longName="Copay Limit Flag" type="ID"/>
<IN2_STOPLOSS_LIMIT_FLG longName="Stoploss Limit Flag" type="ID"/>
<IN2_INSURED_ORG_NAME longName="Insured Organization Name And ID" type="XON"/>
<IN2_INSURED_EMPLOYER_ORG longName="Insured Employer Organization Name And ID"
type="XON"/>
<IN2_RACE longName="Race" type="CE"/>
<IN2_HCFA_RELATION longName="HCFA Patients Relationship to Insured" type="CE"/>
<IN3_ID longName="Set ID - IN3" type="SI"/>

```

```

<IN3_CERT_NO longName="Certification Number" type="CX"/>
<IN3_CERT_BY longName="Certified By" type="XCN"/>
<IN3_CERT_REQ longName="Certification Required" type="ID"/>
<IN3_PENALTY longName="Penalty" type="CM_PEN"/>
<IN3_CERT_DATE longName="Certification Date/Time" type="TS"/>
<IN3_CERT_MOD_DATE longName="Certification Modify Date/Time" type="TS"/>
<IN3_OPERATOR longName="Operator" type="XCN"/>
<IN3_CERT_BEGIN_DATE longName="Certification Begin Date" type="DT"/>
<IN3_CERT_END_DATE longName="Certification End Date" type="DT"/>
<IN3_DAYS longName="Days" type="CM_DTN"/>
<IN3_NONCONCUR_CODE longName="Non-Concur Code/Description" type="CE"/>
<IN3_NONCONCUR_EFF_DATE longName="Non-Concur Effective Date/Time" type="TS"/>
<IN3_PHYS_REV longName="Physician Reviewer" type="XCN"/>
<IN3_CERT_CONTACT longName="Certification Contact" type="ST"/>
<IN3_CERT_CONTACT_TEL longName="Certification Contact Phone Number"
type="XTN"/>
<IN3_APPEAL_REASON longName="Appeal Reason" type="CE"/>
<IN3_CERT_AGENCY longName="Certification Agency" type="CE"/>
<IN3_CERT_AGENCY_TEL longName="Certification Agency Phone Number" type="XTN"/>
<IN3_PRECERT_REQ_WIN longName="Pre-Certification Req/Window" type="CM_PCF"/>
<IN3_CASE_MANAGER longName="Case Manager" type="ST"/>
<IN3_SEC_OPN_DATE longName="Second Opinion Date" type="DT"/>
<IN3_SEC_OPN_STATUS longName="Second Opinion Status" type="IS"/>
<IN3_SEC_OPN_DOC_RX longName="Second Opinion Documentation Received"
type="IS"/>
<IN3_SEC_OPN_PHYS longName="Second Opinion Physician" type="XCN"/>
<PR1_ID longName="Set ID - PR1" type="SI"/>
<PR1_PROC_CODE_METHOD longName="Procedure Coding Method" type="IS"/>
<PR1_PROC_CODE longName="Procedure Code" type="CE"/>
<PR1_PROC_DESC longName="Procedure Description" type="ST"/>
<PR1_PROC_DATE longName="Procedure Date/Time" type="TS"/>
<PR1_PROC_FUNC_TYPE longName="Procedure Functional Type" type="IS"/>
<PR1_PROC_MINS longName="Procedure Minutes" type="NM"/>
<PR1_ANESTHESIOLOGIST longName="Anesthesiologist" type="XCN"/>
<PR1_ANESTH_CODE longName="Anesthesia Code" type="IS"/>
<PR1_ANESTH_MINS longName="Anesthesia Minutes" type="NM"/>
<PR1_SURGEON longName="Surgeon" type="XCN"/>
<PR1_PROC_PRACT longName="Procedure Practitioner" type="XCN"/>
<PR1_CONSENT_CODE longName="Consent Code" type="CE"/>
<PR1_PROC_PRIORITY longName="Procedure Priority" type="ID"/>
<PR1_ASS_DIAG_CODE longName="Associated Diagnosis Code" type="CE"/>
<PR1_PROC_CODE_MOD longName="Procedure Code Modifier" type="CE"/>
<ROL_ID longName="Role Instance ID" type="EI"/>
<ROL_ACT_CODE longName="Action Code" type="ID"/>
<ROL_ROLE longName="Role-ROL" type="CE"/>
<ROL_PERSON longName="Role Person" type="XCN"/>
<ROL_BEGIN_DATE longName="Role Begin Date/Time" type="TS"/>
<ROL_END_DATE longName="Role End Date/Time" type="TS"/>
<ROL_DURATION longName="Role Duration" type="CE"/>

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<ROL_ACT_REASON longName="Role Action Reason" type="CE"/>
<UB1_ID longName="Set ID - UB1" type="SI"/>
<UB1_BLOOD_DEDUCT longName="Blood Deductible (43)" type="NM"/>
<UB1_BLOOD_FURNISHED longName="Blood Furnished-Pints Of (40)" type="NM"/>
<UB1_BLOOD_REPLACED longName="Blood Replaced-Pints (41)" type="NM"/>
<UB1_BLOOD_NOT_REPLACED longName="Blood Not Replaced-Pints(42)" type="NM"/>
<UB1_CO_INS_DAYS longName="Co-Insurance Days (25)" type="NM"/>
<UB1_COND_CODE longName="Condition Code (35-39)" type="IS"/>
<UB1_COVER_DAYS longName="Covered Days - (23)" type="NM"/>
<UB1_NON_COVER_DAYS longName="Non Covered Days - (24)" type="NM"/>
<UB1_VALUE_AMT_CODE longName="Value Amount and Code (46-49)" type="CM_UVC"/>
<UB1_GRACE_DAYS longName="Number Of Grace Days (90)" type="NM"/>
<UB1_SPEC_PROG_IND longName="Special Program Indicator (44)" type="CE"/>
<UB1_PSRO_UR_APP_IND longName="PSRO/UR Approval Indicator (87)" type="CE"/>
<UB1_PSRO_UR_APP_FROM longName="PSRO/UR Approved Stay-Fm (88)" type="DT"/>
<UB1_PSRO_UR_APP_TO longName="PSRO/UR Approved Stay-To (89)" type="DT"/>
<UB1_OCCURRENCE longName="Occurrence (28-32)" type="CM_OCD"/>
<UB1_OCCURRENCE_SPAN longName="Occurrence Span (33)" type="CE"/>
<UB1_OCCUR_SPAN_START_DATE longName="Occur Span Start Date(33)" type="DT"/>
<UB1_OCCUR_SPAN_END_DATE longName="Occur Span End Date (33)" type="DT"/>
<UB1_UB82_LOC2 longName="UB-82 Locator 2" type="ST"/>
<UB1_UB82_LOC9 longName="UB-82 Locator 9" type="ST"/>
<UB1_UB82_LOC27 longName="UB-82 Locator 27" type="ST"/>
<UB1_UB82_LOC45 longName="UB-82 Locator 45" type="ST"/>
<UB2_ID longName="Set ID - UB2" type="SI"/>
<UB2_CO_INS_DAYS longName="Co-Insurance Days (9)" type="ST"/>
<UB2_COND_CODE longName="Condition Code (24-30)" type="IS"/>
<UB2_COVER_DAYS longName="Covered Days (7)" type="ST"/>
<UB2_NON_COVER_DAYS longName="Non-Covered Days (8)" type="ST"/>
<UB2_VALUE_AMT_CODE longName="Value Amount and Code" type="CM_UVC"/>
<UB2_OCCURRENCE_CODE longName="Occurrence Code and Date (32-35)"
type="CM_OCD"/>
<UB2_OCCURRENCE_SPAN longName="Occurrence Span Code/Dates (36)"
type="CM_OSP"/>
<UB2_UB92_LOC2 longName="UB92 Locator 2 (State)" type="ST"/>
<UB2_UB92_LOC11 longName="UB92 Locator 11 (State)" type="ST"/>
<UB2_UB92_LOC31 longName="UB92 Locator 31 (National)" type="ST"/>
<UB2_DOC_CTRL_NO longName="Document Control Number" type="ST"/>
<UB2_UB92_LOC49 longName="UB92 Locator 49 (National)" type="ST"/>
<UB2_UB92_LOC56 longName="UB92 Locator 56 (State)" type="ST"/>
<UB2_UB92_LOC57 longName="UB92 Locator 57 (National)" type="ST"/>
<UB2_UB92_LOC78 longName="UB92 Locator 78 (State)" type="ST"/>
<UB2_SPEC_VISIT_CNT longName="Special Visit Count" type="NM"/>
<CTI_SPNSR_STDY_ID longName="Sponsor Study ID" type="EI"/>
<CTI_STDY_PHSE_ID longName="Study Phase Identifier" type="CE"/>
<CTI_STDY_SCHDLD_TIME_PNT longName="Study Scheduled Time Point" type="CE"/>
<DSC_CNT_PNTR longName="Continuation Pointer" type="ST"/>
<MSH_FIELD_SEP longName="Field Separator" type="ST"/>
<MSH_ENCDNG_CHRS longName="Encoding Characters" type="ST"/>

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<MSH_SND_APP longName="Sending Application" type="HD"/>
<MSH_SND_FAC longName="Sending Facility" type="HD"/>
<MSH_RCV_APP longName="Receiving Application" type="HD"/>
<MSH_RCV_FAC longName="Receiving Facility" type="HD"/>
<MSH_MSG_DATETIME longName="Date/Time Of Message" type="TS"/>
<MSH_SECURITY longName="Security" type="ST"/>
<MSH_MSG_TYPE longName="Message Type" type="CM"/>
<MSH_MSG_CNTRL_ID longName="Message Control ID" type="ST"/>
<MSH_PRCSNG_ID longName="Processing ID" type="PT"/>
<MSH_VRSN_ID longName="Version ID" type="ID"/>
<MSH_SQNC_NM longName="Sequence Number" type="NM"/>
<MSH_CNTN_PNTR longName="Continuation Pointer" type="ST"/>
<MSH_ACCPT_ACK_TYP longName="Accept Acknowledgment Type" type="ID"/>
<MSH_APP_ACK_TYP longName="Application Acknowledgment Type" type="ID"/>
<MSH_CNTRY_CDE longName="Country Code" type="ID"/>
<MSH_CHAR_SET longName="Character Set" type="ID"/>
<MSH_MSG_LANG longName="Principal Language Of Message" type="CE"/>
<NK1_SET_ID longName="Set ID - NK1" type="SI"/>
<NK1_NME longName="Name" type="XPN"/>
<NK1_RLTNSHP longName="Relationship" type="CE"/>
<NK1_ADDRSS longName="Address" type="XAD"/>
<NK1_PHNE_NM longName="Phone Number" type="XTN"/>
<NK1_BUS_PHNE_NM longName="Business Phone Number" type="XTN"/>
<NK1_CNTCT_RLE longName="Contact Role" type="CE"/>
<NK1_STRT_DTE longName="Start Date" type="DT"/>
<NK1_END_DTE longName="End Date" type="DT"/>
<NK1_KIN_JOB_TITLE longName="Next of Kin / Associated Parties Job Title"
type="ST"/>
<NK1_KIN_JOB_CDE longName="Next of Kin / Associated Parties Job Code/Class"
type="JCC"/>
<NK1_KIN_EMP_NM longName="Next of Kin / Associated Parties Employee Number"
type="CX"/>
<NK1_ORG_NME longName="Organization Name - NK1" type="XON"/>
<NK1_MRTL_STS longName="Marital Status" type="CE"/>
<NK1_SEX longName="Sex" type="IS"/>
<NK1_DOB longName="Date/Time Of Birth" type="TS"/>
<NK1_LVNG_DPNDY longName="Living Dependency" type="IS"/>
<NK1_AMBLTRY_STS longName="Ambulatory Status" type="IS"/>
<NK1_CTZNSHP longName="Citizenship" type="CE"/>
<NK1_PRM_LANG longName="Primary Language" type="CE"/>
<NK1_LVNG_ARNGMNT longName="Living Arrangement" type="IS"/>
<NK1_PBLCTY_CDE longName="Publicity Code" type="CE"/>
<NK1_PRTCTN_IND longName="Protection Indicator" type="ID"/>
<NK1_STDNT_IND longName="Student Indicator" type="IS"/>
<NK1_RLGN longName="Religion" type="CE"/>
<NK1_MOTH_MDN_NME longName="Mother's Maiden Name" type="XPN"/>
<NK1_NTNLTY longName="Nationality" type="CE"/>
<NK1_ETHNC_GRP longName="Ethnic Group" type="CE"/>
<NK1_CNTCT_RSN longName="Contact Reason" type="CE"/>

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<NK1_CNTCT_PRSN_NME longName="Contact Person?s Name" type="XPN"/>
<NK1_CNTCT_PRSN_NUM longName="Contact Person?s Telephone Number" type="XTN"/>
<NK1_CNTCT_PRSN_ADD longName="Contact Person?s Address" type="XAD"/>
<NK1_KIN_ID longName="Next of Kin/Associated Party?s Identifiers" type="CX"/>
<NK1_JOB_STS longName="Job Status" type="IS"/>
<NK1_RACE longName="Race" type="CE"/>
<NK1_HANDICAP longName="Handicap" type="IS"/>
<NK1_CNTCT_PRSN_SSN longName="Contact Person Social Security Number"
type="ST"/>
<NTE_SET_ID longName="Set ID - NTE" type="SI"/>
<NTE_SRC longName="Source of Comment" type="ID"/>
<NTE_CMNT longName="Comment" type="FT"/>
<NTE_CMNT_TYP longName="Comment Type" type="CE"/>
<OBR_SET_ID longName="Set ID - OBR" type="SI"/>
<OBR_PLCR_ORDR_NUM longName="Placer Order Number" type="EI"/>
<OBR_FLLR_ORDR_NUM longName="Filler Order Number" type="EI"/>
<OBR_UNVRSL_SRVCE_ID longName="Universal Service ID" type="CE"/>
<OBR_PRIORITY longName="Priority-OBR" type="ID"/>
<OBR_RQSTD_DATETIME longName="Requested Date/time" type="TS"/>
<OBR_OBSRVTN_DATETIME longName="Observation Date/Time #" type="TS"/>
<OBR_OBSRVTN_END_DATETIME longName="Observation End Date/Time #" type="TS"/>
<OBR_CLLCTN_VLME longName="Collection Volume *" type="CQ"/>
<OBR_CLLCTN_ID longName="Collector Identifier *" type="XCN"/>
<OBR_SPCMN_ACTN_CODE longName="Specimen Action Code *" type="ID"/>
<OBR_DNGR_CODE longName="Danger Code" type="CE"/>
<OBR_RLVNT_CLNCL_INF longName="Relevant Clinical Info." type="ST"/>
<OBR_SPCMEN_RCVD_DATETIME longName="Specimen Received Date/Time *" type="TS"/>
<OBR_SPCMEN_SRC longName="Specimen Source *" type="CM_SPS"/>
<OBR_ORDRNG_PRVDR longName="Ordering Provider" type="XCN"/>
<OBR_ORDR_CLLBCK_PHNE_NUM longName="Order Callback Phone Number" type="XTN"/>
<OBR_PLCR_FLD_1 longName="Placer Field 1" type="ST"/>
<OBR_PLCR_FLD_2 longName="Placer Field 2" type="ST"/>
<OBR_FLLR_FLD_1 longName="Filler Field 1 +" type="ST"/>
<OBR_FLLR_FLD_2 longName="Filler Field 2 +" type="ST"/>
<OBR_RPRT_DATETIME longName="Results Rpt/Status Chng - Date/Time +" type="TS"/>
<OBR_CHRG_TO_PRCTCE longName="Charge to Practice +" type="CM"/>
<OBR_DGNSTC_SRV_SCT_ID longName="Diagnostic Serv Sect ID" type="ID"/>
<OBR_RSLT_STS longName="Result Status +" type="ID"/>
<OBR_PRNT_RSLT longName="Parent Result +" type="CM_PRL"/>
<OBR_QNTY_TMNG longName="Quantity/Timing" type="TQ"/>
<OBR_RSLT_COPIES_TO longName="Result Copies To" type="XCN"/>
<OBR_PRNT longName="Parent" type="CM"/>
<OBR_TRNSPRTN_MDE longName="Transportation Mode" type="ID"/>
<OBR_RSN_FOR_STDY longName="Reason for Study" type="CE"/>
<OBR_PRNCPL_RSLT_INTRPRTR longName="Principal Result Interpreter +"
type="CM_NDL"/>
<OBR_ASSTNT_RSLT_INTRPRTR longName="Assistant Result Interpreter +"
type="CM_NDL"/>
<OBR_TCHNCN longName="Technician +" type="CM_NDL"/>

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<OBR_TRNSCRPTNST longName="Transcriptionist +" type="CM_NDL"/>
<OBR_SCHDLDD_DATETIME longName="Scheduled Date/Time +" type="TS"/>
<OBR_NUM_SMPPL_CNTNRS longName="Number of Sample Containers *" type="NM"/>
<OBR_TRNSPRT_LGSTCS longName="Transport Logistics of Collected Sample *"
  type="CE"/>
<OBR_CLLCTRS_CMMNT longName="Collector?s Comment *" type="CE"/>
<OBR_TRNSPRT_ARRNGMNT_RSPNSBLTY longName="Transport Arrangement
  responsibility" type="CE"/>
<OBR_TRNSPRT_ARRNGD longName="Transport Arranged" type="ID"/>
<OBR_ESCRT_RQRD longName="Escort Required" type="ID"/>
<OBR_PLNND_PATNT_TRNSPRT_CMMNT longName="Planned Patient Transport Comment"
  type="CE"/>
<OBX_SET_ID longName="Set ID - OBX" type="SI"/>
<OBX_VALUE_TYP longName="Value Type" type="ID"/>
<OBX_OBSRVTN_ID longName="Observation Identifier" type="CE"/>
<OBX_OBSRVTN_SUB_ID longName="Observation Sub-ID" type="ST"/>
<OBX_OBSRVTN_VALUE longName="Observation Value" type="@OBX_VALUE_TYP"/>
<OBX_UNITS longName="Units" type="CE"/>
<OBX_RFRNCS_RNG longName="References Range" type="ST"/>
<OBX_ABNRML_FLGS longName="Abnormal Flags" type="ID"/>
<OBX_PRBLTY longName="Probability" type="NM"/>
<OBX_NATURE_OF_ABNRML_TST longName="Nature of Abnormal Test" type="ID"/>
<OBX_OBSRV_RSLT_STS longName="Observation Result Status" type="ID"/>
<OBX_DATE_LST_OBS_NRML_VAL longName="Date Last Obs Normal Values" type="TS"/>
<OBX_USR_DFND_ACCSS_CHKS longName="User Defined Access Checks" type="ST"/>
<OBX_OBSV_DATETIME longName="Date/Time of the Observation" type="TS"/>
<OBX_PRDCERS_ID longName="Producer's ID" type="CE"/>
<OBX_RSPNSBLE_OBSVR longName="Responsible Observer" type="XCN"/>
<OBX_OBSRVTN_MTHD longName="Observation Method" type="CE"/>
<ORC_ORDR_CNTRL longName="Order Control" type="ID"/>
<ORC_PLCR_ORDR_NUM longName="Placer Order Number" type="EI"/>
<ORC_FLLR_ORDR_NUM longName="Filler Order Number" type="EI"/>
<ORC_PLCR_GRP_NUM longName="Placer Group Number" type="EI"/>
<ORC_ORDR_STS longName="Order Status" type="ID"/>
<ORC_RSPNS_FLG longName="Response Flag" type="ID"/>
<ORC_QNTY_TMNG longName="Quantity/Timing" type="TQ"/>
<ORC_PARENT longName="Parent" type="CM"/>
<ORC_XN_DATETIME longName="Date/Time of Transaction" type="TS"/>
<ORC_ENTRD_BY longName="Entered By" type="XCN"/>
<ORC_VRFD_BY longName="Verified By" type="XCN"/>
<ORC_ORDRNG_PRVDR longName="Ordering Provider" type="XCN"/>
<ORC_ENTRS_LOC longName="Enterer?s Location" type="PL"/>
<ORC_ENTRS_LOC longName="Call Back Phone Number" type="XTN"/>
<ORC_CLL_BCK_PHNE_NUM longName="Order Effective Date/Time" type="TS"/>
<ORC_ORDR_EFF_DATETIME longName="Order Control Code Reason" type="CE"/>
<ORC_ORDR_CNTRL_CODE_RSN longName="Entering Organization" type="CE"/>
<ORC_ENTRNG_ORG longName="Entering Device" type="CE"/>
<ORC_ENTRNG_DVCE longName="Action By" type="XCN"/>
<ORC_ADNVCD_BNFCRY_NTCE_CODE longName="Advanced Beneficiary Notice Code"

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type="CE"/>
<ORC_ORD_FAC_NAME longName="Ordering Facility Name" type="XON"/>
<ORC_ORD_FAC_ADD longName="Ordering Facility Address" type="XAD"/>
<ORC_ORD_FAC_PHONE longName="Ordering Facility Phone Number" type="XTN"/>
<ORC_ORD_PROV_ADD longName="Ordering Provider Address" type="XAD"/>
<PD1_LVNG_DPNCY longName="Living Dependency" type="IS"/>
<PD1_LVNG_ARRNGMNT longName="Living Arrangement" type="IS"/>
<PD1_PATNT_PRM_FAC longName="Patient Primary Facility" type="XON"/>
<PD1_PATNT_PRM_CARE_PRV longName="Patient Primary Care Provider Name "
type="XCN"/>
<PD1_STDNT_IND longName="Student Indicator" type="IS"/>
<PD1_HANDICAP longName="Handicap" type="IS"/>
<PD1_LVNG_WILL longName="Living Will" type="IS"/>
<PD1_ORGN_DNR longName="Organ Donor" type="IS"/>
<PD1_SEPARATE_BILL longName="Separate Bill" type="ID"/>
<PD1_DUP_PATNT longName="Duplicate Patient" type="CX"/>
<PD1_PBLCTY_CDE longName="Publicity Code" type="CE"/>
<PD1_PRTCTN_IND longName="Protection Indicator" type="ID"/>
<PID_SET_ID longName="Set ID - PID" type="SI"/>
<PID_PATNT_ID longName="Patient ID" type="CX"/>
<PID_PATNT_ID_LST longName="Patient Identifier List" type="CX"/>
<PID_ALT_PATNT_ID longName="Alternate Patient ID - PID" type="CX"/>
<PID_PATNT_NAME longName="Patient Name" type="XPN"/>
<PID_MTHR_MDN_NME longName="Mother's Maiden Name" type="XPN"/>
<PID_DOB longName="Date/Time Of Birth" type="TS"/>
<PID_SEX longName="Sex" type="IS"/>
<PID_ALIAS longName="Patient Alias" type="XPN"/>
<PID_RACE longName="Race" type="CE"/>
<PID_PATNT_ADDRSS longName="Patient Address" type="XAD"/>
<PID_COUNTY_CDE longName="County Code" type="IS"/>
<PID_PHNE_HME longName="Phone Number - Home" type="XTN"/>
<PID_PHNE_BUS longName="Phone Number - Business" type="XTN"/>
<PID_PRRY_LANG longName="Primary Language" type="CE"/>
<PID_MRRL_STS longName="Marital Status" type="CE"/>
<PID_RLGN longName="Religion" type="CE"/>
<PID_PATNT_ACC_NM longName="Patient Account Number" type="CX"/>
<PID_SSN_NM longName="SSN Number - Patient" type="ST"/>
<PID_DRVR_LCNS_NM longName="Driver's License Number - Patient" type="DLN"/>
<PID_MTHR_ID longName="Mother's Identifier" type="CX"/>
<PID_ETHNIC_GRP longName="Ethnic Group" type="CE"/>
<PID_BRTH_PLG longName="Birth Place" type="ST"/>
<PID_MLTPLE_BRTH_IND longName="Multiple Birth Indicator" type="ID"/>
<PID_BRTH_ORDR longName="Birth Order" type="NM"/>
<PID_CTZNSHP longName="Citizenship" type="CE"/>
<PID_VTRNS_MIL_STS longName="Veterans Military Status" type="CE"/>
<PID_NTNLTY longName="Nationality" type="CE"/>
<PID_PATNT_DTH_DATE_TIME longName="Patient Death Date and Time" type="TS"/>
<PID_PATNT_DTH_IND longName="Patient Death Indicator" type="ID"/>
<PV1_SET_ID longName="Set ID - PV1" type="SI"/>

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<PV1_PATNT_CLSS longName="Patient Class" type="IS"/>
<PV1_ASGND_PATNT_LCTN longName="Assigned Patient Location" type="PL"/>
<PV1_ADMSN_TYP longName="Admission Type" type="IS"/>
<PV1_PREADMT_NUM longName="Preadmit Number" type="CX"/>
<PV1_PRIOR_PATNT_LOC longName="Prior Patient Location" type="PL"/>
<PV1_ATNDNG_DCTR longName="Attending Doctor" type="XCN"/>
<PV1_RFRNG_DCTR longName="Referring Doctor" type="XCN"/>
<PV1_CNSLTNG_DCTR longName="Consulting Doctor" type="XCN"/>
<PV1_HSPTL_SRVCE longName="Hospital Service" type="IS"/>
<PV1_TMP_LOC longName="Temporary Location" type="PL"/>
<PV1_PREADMIT_TST_IND longName="Preadmit Test Indicator" type="IS"/>
<PV1_READMSSN_IND longName="Re-admission Indicator" type="IS"/>
<PV1_ADMNT_SRC longName="Admit Source" type="IS"/>
<PV1_AMBLTRY_STS longName="Ambulatory Status" type="IS"/>
<PV1_VIP_IND longName="VIP Indicator" type="IS"/>
<PV1_ADMTTNG_DCTR longName="Admitting Doctor" type="XCN"/>
<PV1_PATNT_TYP longName="Patient Type" type="IS"/>
<PV1_VST_NUM longName="Visit Number" type="CX"/>
<PV1_FNCL_CLSS longName="Financial Class" type="FC"/>
<PV1_CHRG_PRC_IND longName="Charge Price Indicator" type="IS"/>
<PV1_CRTSY_CODE longName="Courtesy Code" type="IS"/>
<PV1_CRDT_RTNG longName="Credit Rating" type="IS"/>
<PV1_CNTRCT_CODE longName="Contract Code" type="IS"/>
<PV1_CNTRCT_EFFCTV_DTE longName="Contract Effective Date" type="DT"/>
<PV1_CNTRCT_AMMNT longName="Contract Amount" type="NM"/>
<PV1_CNTRCT_PRD longName="Contract Period" type="NM"/>
<PV1_INTRST_CODE longName="Interest Code" type="IS"/>
<PV1_TRNSFR_BAD_DEBT_CODE longName="Transfer to Bad Debt Code" type="IS"/>
<PV1_TRNSFR_BAD_DEBT_DTE longName="Transfer to Bad Debt Date" type="DT"/>
<PV1_BAD_DEBT_AGENCY_CODE longName="Bad Debt Agency Code" type="IS"/>
<PV1_BAD_DEBT_TRNSFR_AMNT longName="Bad Debt Transfer Amount" type="NM"/>
<PV1_BAD_DEBT_RCVRY_AMNT longName="Bad Debt Recovery Amount" type="NM"/>
<PV1_DLT_ACCNT_IND longName="Delete Account Indicator" type="IS"/>
<PV1_DLT_ACCNT_DTE longName="Delete Account Date" type="DT"/>
<PV1_DSCHRG_DSPSTN longName="Discharge Disposition" type="IS"/>
<PV1_DSCHRG_LOC longName="Discharged to Location" type="CM"/>
<PV1_DIET_TYP longName="Diet Type" type="CE"/>
<PV1_SRVCNG_FAC longName="Servicing Facility" type="IS"/>
<PV1_BED_STS longName="Bed Status" type="IS"/>
<PV1_ACCNT_STS longName="Account Status" type="IS"/>
<PV1_PNDNG_LOC longName="Pending Location" type="PL"/>
<PV1_PRIOR_TMP_LOC longName="Prior Temporary Location" type="PL"/>
<PV1_ADMT_DTE longName="Admit Date/Time" type="TS"/>
<PV1_DSCHRG_DTE longName="Discharge Date/Time" type="TS"/>
<PV1_CRRNT_PATNT_BLNC longName="Current Patient Balance" type="NM"/>
<PV1_TOT_CHRG longName="Total Charges" type="NM"/>
<PV1_TOT_ADJSMNTS longName="Total Adjustments" type="NM"/>
<PV1_TOT_PYMNTS longName="Total Payments" type="NM"/>
<PV1_ALTRNT_VST_ID longName="Alternate Visit ID" type="CX"/>

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<PV1_VST_IND longName="Visit Indicator" type="IS"/>
<PV1_OTHR_HLTHCR_PRIVDR longName="Other Healthcare Provider" type="XCN"/>
<PV2_PRIOR_PNDNG_LOC longName="Prior Pending Location" type="PL"/>
<PV2_ACCMMDTN_CODE longName="Accommodation Code" type="CE"/>
<PV2_ADMT_RSN longName="Admit Reason" type="CE"/>
<PV2_TRNSFR_RSN longName="Transfer Reason" type="CE"/>
<PV2_PATNT_VAL longName="Patient Valuables" type="ST"/>
<PV2_PATNT_VAL_LOC longName="Patient Valuables Location" type="ST"/>
<PV2_VST_USR_CODE longName="Visit User Code" type="IS"/>
<PV2_EXPCTD_ADMT_DATETIME longName="Expected Admit Date/Time" type="TS"/>
<PV2_EXPCTD_DSCHRG_DATETIME longName="Expected Discharge Date/Time"
type="TS"/>
<PV2_ESTMTD_LNGTH_INPATNT_STAY longName="Estimated Length of Inpatient Stay"
type="NM"/>
<PV2_ACTL_LNGTH_INPATNT_STAY longName="Actual Length of Inpatient Stay"
type="NM"/>
<PV2_VST_DSCRPTN longName="Visit Description" type="ST"/>
<PV2_RFRRL_SRC_CODE longName="Referral Source Code" type="XCN"/>
<PV2_PRVS_SRVC_DTE longName="Previous Service Date" type="DT"/>
<PV2_EMPLYMNT_ILLNSS_RLTD_IND longName="Employment Illness Related Indicator"
type="ID"/>
<PV2_PRG_STS_CODE longName="Purge Status Code" type="IS"/>
<PV2_PRG_STS_DTE longName="Purge Status Date" type="DT"/>
<PV2_SPCL_PRGM_CODE longName="Special Program Code" type="IS"/>
<PV2_RTNTN_IND longName="Retention Indicator" type="ID"/>
<PV2_EXPCTD_NUM_INSRNC_PLNS longName="Expected Number of Insurance Plans"
Type="NM"/>
<PV2_VST_PBLCTY_CODE longName="Visit Publicity Code" type="IS"/>
<PV2_VST_PRTCTN_IND longName="Visit Protection Indicator" type="ID"/>
<PV2_CLNC_ORG_NAME longName="Clinic Organization Name" type="XON"/>
<PV2_PATNT_STS_CODE longName="Patient Status Code" type="IS"/>
<PV2_VST_PRTY_CODE longName="Visit Priority Code" type="IS"/>
<PV2_PRVS_TRTMNT_DTE longName="Previous Treatment Date" type="DT"/>
<PV2_EXPCTD_DSCHRG_DSPSTN longName="Expected Discharge Disposition"
type="IS"/>
<PV2_SGNTRE_ON_FILE_DTE longName="Signature on File Date" type="DT"/>
<PV2_FRST_SMLR_ILLNSS_DTE longName="First Similar Illness Date" type="DT"/>
<PV2_PATNT_CHRGE_ADJSTMNT_CODE longName="Patient Charge Adjustment Code"
type="CE"/>
<PV2_RCRRNG_SRVC_CODE longName="Recurring Service Code" type="IS"/>
<PV2_BLLNG_MEDIA_CODE longName="Billing Media Code" type="ID"/>
<PV2_EXPCTD_SRGRY_DATETIME longName="Expected Surgery Date " type="TS"/>
<PV2_MLTRY_PRTNRSHP_CODE longName="Military Partnership Code" type="ID"/>
<PV2_MLTRY_NON_AVLBLTY_CODE longName="Military Non-Availability Code"
Type="ID"/>
<PV2_NWBRN_BABY_IND longName="Newborn Baby Indicator" type="ID"/>
<PV2_BABY_DTND_IND longName="Baby Detained Indicator" type="ID"/>
<ZLR_ORD_PROVIDER_ADD longName="Ordering Providers Address" type="XAD"/>
<ZLR_ORD_FAC_NAME longName="Ordering Facility Name" type="XON"/>

```

```

<ZLR_ORD_FAC_ADD longName="Ordering Facility Address" type="XAD"/>
<ZLR_ORD_FAC_PHONE longName="Ordering Facility Phone" type="XTN"/>
<ZLR_PATIENT_AGE longName="Patient Age" type="SN"/>
<ZLR_NEXT_KIN_NAME longName="Next of Kin/Assoc. Name" type="XPN"/>
<ZLR_NEXT_KIN_RELATION longName="Next of Kin/Assoc. Relationship" type="CE"/>
<ZLR_NEXT_KIN_ADD longName="Next of Kin/Assoc. Address" type="XAD"/>
<ZLR_NEXT_KIN_PHONE longName="Next of Kin/Assoc. Phone" type="XTN"/>
<!-- Batch control segments -->
<FHS_FIELD_SEP longName="Field Sparator" type="ST"/>
<FHS_ENCDNG_CHRS longName="Encoding Characters" type="ST"/>
<FHS_SND_APP longName="Sending Application" type="ST"/>
<FHS_SND_FAC longName="Sending Facility" type="ST"/>
<FHS_RCV_APP longName="Receiving Application" type="ST"/>
<FHS_RCV_FAC longName="Receiving Facility" type="ST"/>
<FHS_DATETIME longName="Creation timestamp" type="TS"/>
<FHS_SECURITY longName="Security" type="ST"/>
<FHS_NAME longName="file name/id/type" type="ST"/>
<FHS_COMMENT longName="Comments" type="ST"/>
<FHS_CONTROL_ID longName="Control ID" type="ST"/>
<FHS_REF_CONTROL_ID longName="Reference file control id" type="ST"/>
<FTS_BATCH_COUNT longName="Batch Count" type="NM"/>
<FTS_COMMENT longName="File trailer Comment" type="ST"/>
<BHS_FIELD_SEP longName="Field Sparator" type="ST"/>
<BHS_ENCDNG_CHRS longName="Encoding Characters" type="ST"/>
<BHS_SND_APP longName="Sending Application" type="ST"/>
<BHS_SND_FAC longName="Sending Facility" type="ST"/>
<BHS_RCV_APP longName="Receiving Application" type="ST"/>
<BHS_RCV_FAC longName="Receiving Facility" type="ST"/>
<BHS_DATETIME longName="Creation timestamp" type="TS"/>
<BHS_SECURITY longName="Security" type="ST"/>
<BHS_NAME longName="Batch name/id/type" type="ST"/>
<BHS_COMMENT longName="Comments" type="ST"/>
<BHS_CONTROL_ID longName="Control ID" type="ST"/>
<BHS_REF_CONTROL_ID longName="Reference batch control id" type="ST"/>
<BTS_MSG_COUNT longName="Message Count" type="ST"/>
<BTS_COMMENT longName="Batch Trailer Comment" type="ST"/>
<BTS_TOTALS longName="Batch Totals" type="NM"/>
</schema>

```

---

## Data Type Definitions

The following data types require format validation. The notation uses square brackets ( [ ] ) to define optionality.



**Table A-1 Data Types Requiring Format Validation**

<b>Name</b>	<b>Description</b>	<b>Format</b>
DT	Date	Must be in the format YYYY[[MM]DD].
NM	Numeric	Must contain a number. A sign (+/-) is optional. A decimal point is optional.
SI	Sequence ID	Must contain a non-negative integer.
ST	String	Should contain only printable ASCII characters. Should be less than 200 characters.
TM	Time	Should be in the format HH[MM[SS[.S[S[S[S]]]]]] [+/-ZZZZ]
TN	Telephone Number	For use in countries conforming to the United States standard. Should be in the format [NN] [(999)] 999-9999 [X99999] [B99999] [C any text] X99999 – an optional extension number B99999 – an optional beeper number C - any comments.
TS	Time Stamp	Should be in the format YYYY[MM[DD[HHMM[SS[.S[S[S[S]]]]]]]] [+/-ZZZZ]

## Lookup Validation

The following table shows the various fields of segments of Message ORU that require lookup validation.

**Table A-2 Message ORU Requiring Validation**

<b>Table</b>	<b>HL7/User</b>	<b>Table Number</b>
0001	User	Sex
0002	User	Marital Status
0003	HL7	Event Type
0004	User	Patient Class

**Table A-2 Message ORU Requiring Validation (Continued)**

<b>Table</b>	<b>HL7/User</b>	<b>Table Number</b>
0005	User	Race
0006	User	Religion
0007	User	Admission Type
0009	User	Ambulatory Status
0010	User	Physician ID
0018	User	Patient Type
0021	User	Bad debt agency code
0023	User	Admit source
0032	User	Charge/price indicator
0038	HL7	Order status
0044	User	Contract code
0045	User	Courtesy code
0046	User	Credit rating
0063	User	Relationship
0064	User	Financial Class
0069	User	Hospital service
0070	HL7	Specimen source codes
0073	User	Interest rate code
0074	HL7	Diagnostic service section ID
0078	HL7	Abnormal flags
0080	HL7	Nature of abnormal testing
0085	HL7	Observation result status codes
0087	User	Preadmit test indicator

**Table A-2 Message ORU Requiring Validation (Continued)**

<b>Table</b>	<b>HL7/User</b>	<b>Table Number</b>
0092	User	Re-admission indicator
0099	User	VIP indicator
0104	HL7	Version ID
0105	HL7	Source of comment
0110	User	Transfer to bad debt code
0111	User	Delete account code
0112	User	Discharge disposition
0113	User	Discharged to location
0114	User	Diet type
0115	User	Serving facility
0116	User	Bed status
0117	User	Account status
0119	HL7	Order control codes
0121	HL7	Response flag
0123	HL7	Result status
0124	HL7	Transportation mode
0125	HL7	Value type
0129	User	Accommodation code
0130	User	Visit user code
0131	User	Contact role
0136	HL7	Yes/no indicator
0155	HL7	Accept/application acknowledgment conditions

**Table A-2 Message ORU Requiring Validation (Continued)**

<b>Table</b>	<b>HL7/User</b>	<b>Table Number</b>
0171	User	Citizenship
0172	User	Veterans Military status
0189	User	Ethnic group
0203	User	Identifier type
0211	HL7	Alternate character sets
0212	User	Nationality
0213	User	Purge status
0215	User	Publicity code
0216	User	Patient status code
0217	User	Visit priority code
0218	User	Patient charge adjustment code
0219	User	Recurring service code
0220	User	Living arrangement
0222	User	Contact reason
0223	User	Living dependency
0224	HL7	Transport arranged
0225	HL7	Escort required
0231	User	Student status
0295	User	Handicap
0296	User	Primary language
0311	User	Job status
0315	User	Living will
0316	User	Organ donor

**Table A-2 Message ORU Requiring Validation (Continued)**

Table	HL7/User	Table Number
0326	User	Visit indicator
0327	User	Job code/class
0328	User	Employee classification
0339	User	Advanced beneficiary notice code

## Sample Conversion

An XML conversion from an HL7 ORU message.

**Listing A-4 XML Conversion from an HL7 ORU Message**

```

<!-- MSH|^~\&|XRAY|CDB|||ORU^R01|K172|P<cr>                                -->
<!-- PID|1|0123456|1||ROBERTSON^JOHN^H|||||9821111<cr> -->
<!-- OBR|1|X89?1501^OE|78912^RD|71020^CHEST XRAY AP &                                -->
<!-- LATERAL|R|198703291530|19873290800||JBM|N<cr>-->
<!-- OBX|1|CE|71020^RADIOLOGIST'S IMPRESSION|4|^MASS LEFT LOWER
LOBE|1||A|F<cr> -->
<!-- OBX|2|CE|71020|2|^INFILTRATE RIGHT LOWER LOBE||A|F<cr>-->
<!-- OBX|3|CE|71020|3|^HEART SIZE NORMAL||N|F<cr> -->
<!-- OBX|4|FT|71020|1|circular density (2 x 2 cm) is seen in the posterior
segment -->
<!-- of the LLL.A second, less well?defined infiltrated circulation density
-->
<!-- is seen in the R mid lung field and appears to cross the minor -->
<!--fissure#|||||F<cr> -->
<!-- OBX|5|CE|71020||71020^Follow up CXR 1 month||30?45||||F<cr> -->

<!DOCTYPE ORU>
<ORU>
<MSH>
<MSH.FIELD_SEP>|</MSH.FIELD_SEP>
<MSH.ENCDNG_CHRS>^~\&amp;</MSH.ENCDNG_CHRS>
<MSH.SND_APP>XRAY</MSH.SND_APP>
<MSH.RCV_APP>CDB</MSH.RCV_APP>
<MSH.MSG_TYPE>
<CM_MSG.MSG_TYP>ORU</CM_MSG.MSG_TYP>

```

```

<CM_MSG.TRGR_TYP>R01</CM_MSG.TRGR_TYP>
</MSH.MSG_TYPE>
<MSH.MSG_CNTRL_ID>K172</MSH.MSG_CNTRL_ID>
<MSH.PRCSNG_ID>P</MSH.PRCSNG_ID>
</MSH>
<PID>
<PID.SET_ID>1</PID.SET_ID>
<PID.PATNT_ID>0123456?1</PID.PATNT_ID>
<PID.ALT_PATNT_ID_LIST>1</PID.ALT_PATNT_ID_LIST>
<PID.PATNT_NAME>
<PN.FMLY_NME>ROBERTSON</PN.FMLY_NME>
<PN.GVN_NME>JOHN</PN.GVN_NME>
<PN.MDDL_NME>H</PN.MDDL_NME>
</PID.PATNT_NAME>
<PID.COUNTY_CDE>9821111</PID.COUNTY_CDE>
</PID>
<OBR>
<OBR.SET_ID>1</OBR.SET_ID>
<OBR.PLCR_ORDR_NUM>
<EI.ENTY_ID>X89?1501</EI.ENTY_ID>
<EI.NMSPC_ID>OE</EI.NMSPC_ID>
</OBR.PLCR_ORDR_NUM>
<OBR.FLLR_ORDR_NUM>
<EI.ENTY_ID>78912</EI.ENTY_ID>
<EI.NMSPC_ID>RD</EI.NMSPC_ID>
</OBR.FLLR_ORDR_NUM>
<OBR.UNVRSL_SRVCE_ID>
<CE.ID>71020</CE.ID>
<CE.TXT>CHEST XRAY AP & LATERAL</CE.TXT>
</OBR.UNVRSL_SRVCE_ID>
<OBR.PRIORITY>R</OBR.PRIORITY>
<OBR.RQSTD_DATETIME>198703291530</OBR.RQSTD_DATETIME>
<OBR.OBSRVTN_DATETIME>19873290800</OBR.OBSRVTN_DATETIME>
<OBR.CLLCTN_ID>JBM</OBR.CLLCTN_ID>
<OBR.SPCMN_ACTN_CODE>N</OBR.SPCMN_ACTN_CODE>
</OBR>
<OBX>
<OBX.SET_ID>1</OBX.SET_ID>
<OBX.VALUE_TYP>CE</OBX.VALUE_TYP>
<OBX.OBSRVTN_ID>
<CE.ID>71020</CE.ID>
<CE.TXT>RADIOLOGIST'S IMPRESSION</CE.TXT>
</OBX.OBSRVTN_ID>
<OBX.OBSRVTN_SUB_ID>4</OBX.OBSRVTN_SUB_ID>

```

```

<OBX.UNITS>
<CE.TXT>MASS LEFT LOWER LOBE</CE.TXT>
</OBX.UNITS>
<OBX.RFRNCNS_RNG>1</OBX.RFRNCNS_RNG>
<OBX.PRBLTY>A</OBX.PRBLTY>
<OBX.OBSRV_RSLT_STS>F</OBX.OBSRV_RSLT_STS>
</OBX>
<OBX>
<OBX.SET_ID>2</OBX.SET_ID>
<OBX.VALUE_TYP>CE</OBX.VALUE_TYP>
<OBX.OBSRVTN_ID>
<CE.ID>71020</CE.ID>
</OBX.OBSRVTN_ID>
<OBX.OBSRVTN_SUB_ID>2</OBX.OBSRVTN_SUB_ID>
<OBX.OBSRVTN_VALUE>
<CE.TXT>INFILTRATE RIGHT LOWER LOBE</CE.TXT>
</OBX.OBSRVTN_VALUE>
<OBX.ABNRML_FLGS>A</OBX.ABNRML_FLGS>
<OBX.NATURE_OF_ABNRML_TST>F</OBX.NATURE_OF_ABNRML_TST>
</OBX>
<OBX>
<OBX.SET_ID>3</OBX.SET_ID>
<OBX.VALUE_TYP>CE</OBX.VALUE_TYP>
<OBX.OBSRVTN_ID>
<CE.ID>71020</CE.ID>
</OBX.OBSRVTN_ID>
<OBX.OBSRVTN_SUB_ID>3</OBX.OBSRVTN_SUB_ID>
<OBX.OBSRVTN_VALUE>
<CE.TXT>HEART SIZE NORMAL</CE.TXT>
</OBX.OBSRVTN_VALUE>
<OBX.ABNRML_FLGS>N</OBX.ABNRML_FLGS>
<OBX.NATURE_OF_ABNRML_TST>F</OBX.NATURE_OF_ABNRML_TST>
</OBX>
<OBX>
<OBX.SET_ID>4</OBX.SET_ID>
<OBX.VALUE_TYP>FT</OBX.VALUE_TYP>
<OBX.OBSRVTN_ID>
<CE.ID>71020</CE.ID>
</OBX.OBSRVTN_ID>
<OBX.OBSRVTN_SUB_ID>1</OBX.OBSRVTN_SUB_ID>
<OBX.OBSRVTN_VALUE>
<CE.TXT>circular density (2 x 2 cm) is seen in the posterior segment of the
LLL. A second, less well defined infiltrated circulation density is seen in
the R mid lung field and appears to cross the minor fissure#</CE.TXT>

```

```

</OBX.OBSRVTN_VALUE>
<OBX.NATURE_OF_ABNRML_TST>F</OBX.NATURE_OF_ABNRML_TST>
</OBX>
<OBX>
<OBX.SET_ID>5</OBX.SET_ID>
<OBX.VALUE_TYP>CE</OBX.VALUE_TYP>
<OBX.OBSRVTN_ID>
<CE.ID>71020</CE.ID>
</OBX.OBSRVTN_ID>
<OBX.OBSRVTN_VALUE>
<CE.ID>71020</CE.ID>
<CE.TXT>Follow up CXR 1 month</CE.TXT>
</OBX.OBSRVTN_VALUE>
<OBX.RFRNCS_RNG>30?45</OBX.RFRNCS_RNG>
<OBX.OBSRV_RSLT_STS>F</OBX.OBSRV_RSLT_STS>
</OBX>
</ORU>

```

---

## Validation Rules File

The following is a partial rules file that will be used to define the rules of HL7 validation. There are two table lookup methods; one for tables that are defined as part of HL7 and another for user tables that vary from implementation to implementation.

### Listing A-5 Rules File

---

```

<ORU>
<using class="XDHL7Rules">
<rule tag="MSH.FIELD_SEP" method="isString" code="">
<rule tag="MSH.ENCDNG_CHRS" method="isString" code="">
<rule tag="MSH.SND_APP" method="isString" code="">
<rule tag="MSH.SND_FAC" method="isString" code="">
<rule tag="MSH.RCV_APP" method="isString" code="">
<rule tag="MSH.RCV_FAC" method="isString" code="">
<rule tag="MSH.MSG_DATETIME" method="isDateTime" code="">
<rule tag="MSH.SECURITY" method="isString" code="">
<rule tag="MSH.MSG_TYPE" method="inHL7Lookup" code="table=0076">
<rule tag="MSH.MSG_CNTRL_ID" method="isString" code="">
<rule tag="MSH.PRCNG_ID" method="isString" code="">
<rule tag="MSH.VRSN_ID" method="inHL7Lookup" code="table=0104">
<rule tag="MSH.SQNC_NM" method="isNumeric" code="">

```



```

<rule tag="MSH.CNTN_PNTR" method="isString" code="">
<rule tag="MSH.ACCEPT_ACK_TYP" method="inUserLookup" code="0155">
<rule tag="MSH.APP_ACK_TYP" method="inUserLookup" code="0155">
<rule tag="MSH.CNTRY_CDE" method="isString" code="">
<rule tag="MSH.CHAR_SET" method="inUserLookup" code="0211">
<rule tag="MSH.MSG_LANG" method="isString" code="">
<rule tag="MSH.ALT_CHAR_SET" method="isString" code="">
</using>
</ORU>

```

---

## Error Codes

The error codes returned in acknowledgment documents are defined in the following HL7 table 0357.

**Table A-3 Error Codes**

Code	Meaning
0	Message Accepted
100	Segment sequence error
101	Required field missing
102	Data type error
103	Table value not found
200	Unsupported message type
201	Unsupported event code
202	Unsupported processing id
203	Unsupported version id
204	Unknown key identifier
205	Duplicate key identifier
206	Application record locked
207	Application internal error



---

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