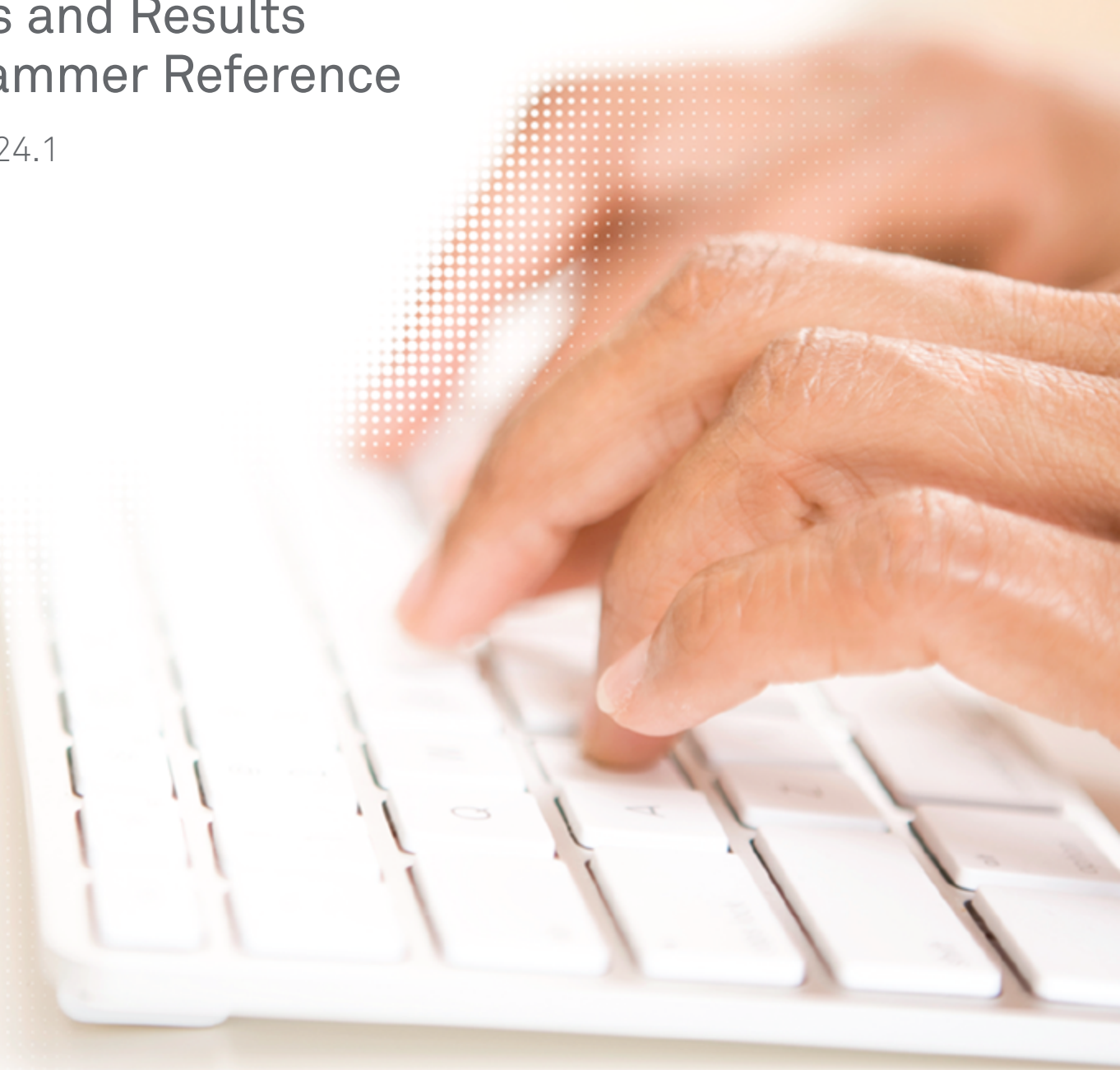


Quantumⁱ

Quantum Hub

Orders and Results
Programmer Reference

Release 24.1



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Release 24.1

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About this manual

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Introduction

This programmer reference provides information on creating web service client applications that interact with the Quest Diagnostics® Quatum® Hub. It is intended for programmers who will write client applications to interact with the following web service(s):

- **Orders.** There are 2 methods for submitting and acknowledging orders to Quest labs: a RESTful method called JAX-RS, and a SOAP method called JAX-WS. Both support the submission and acknowledgment of Advance Beneficiary Notice (ABN) and requisition requests.
- **Results.** Both JAX-RS and JAX-WS Results Retrieval web services support the retrieval and acknowledgment of the following lab result types from the Quatum Hub results database:
 - **HL7 results.** The client application can retrieve and acknowledge an individual results message, or a group of results messages, in HL7 format. Supported results formats include HL7 2.3, 2.3.1 and 2.5.1
 - **Printable (PDF) results.** The client application can retrieve and acknowledge a printable lab results document formatted in PDF
 - **Observation results.** The client application can retrieve and acknowledge results as a bundle of HL7 messages and PDF documents. A configuration option determines the type of PDF documents (clinical, enhanced, or both) that are delivered in the HL7 bundle

There is also a push method for receiving results. For more information, see [Chapter 14, “Push method for receiving lab results” beginning on page 430](#).

Intended audience

To use this programmer reference, you should have a working knowledge of the following subjects:

- One of the following application development environments:
 - Any Java® interactive development environment (IDE) or application text editor, for creating Java web service clients
 - Microsoft® Visual Studio®, for creating supported web service clients (for example, Visual Basic® or C#)
- The following standards-based programming technologies:
 - Web services
 - Extensible Markup Language (XML)
 - Secure Hypertext Transfer Protocol (HTTPS)
 - Simple Object Access Protocol (SOAP)
 - Web Services Definition Language (WSDL)
 - Open Authorization (OAuth) 2.0

Disclaimers

- This programmer reference provides a brief overview of each of the above development environments and technologies, but it by no means attempts to provide exhaustive documentation on any of these topics. Many third-party resources on these topics are available. To get started, see [“Related documentation” on page xvii](#) for a list of online resources
- All sample code referenced in this programmer reference and the associated Quantum Hub Implementation Toolkit (HIT) is provided for example purposes only, and it may need to be modified to work in your environment. It is provided “as is,” without warranty of any kind, or support, from Quest

What's new in this release

Quest Diagnostics Quanam Hub® provides no feature updates or enhancements for the release.

This *Orders and Results Programmer Reference* was updated to the latest Quest branding and style.

Documentation conventions

The documentation uses the following conventions:

- Manual titles, special terms, webpage and dialog box titles, menu items, toolbar button names, labels that appear on webpages and dialog boxes, and keyboard key names appear in *italic*
Italic is also used to indicate variables. For example, an email address might be presented as *name@company.com*. When typing the address, you would use the actual user name and company name rather than *name* and *company*
- Words that are being emphasized appear in **bold**
- Text that you type as well as code samples appear in `this type style`
- The greater than symbol (>) indicates a series of menu items to click. For example, the instructions to click the *File* menu item and then click *Open* might be presented in the following way: “Click *File* > *Open*”
- Important information is displayed in several ways:

Tip: A tip contains information that, while not essential, may make your task easier.

Note: A note indicates exceptions to the stated rule, or information that emphasizes or supplements important points in the main text. A note can supply information that might apply only in a special case.

Caution! A caution indicates that failure to take or avoid a specified action could result in losing data. When you see a caution, follow the instructions carefully.

- When viewing this manual using Adobe® Reader®, we recommend that you do the following to ensure optimal display:

Note: The following steps are specific to Adobe Reader version 23.x; the procedure may vary based on the version you are using.

- a Click *Edit* > *Preferences*.
- b In the *Categories* list, click *Page Display*.
- c In the *Rendering* area, clear the *Enhance thin lines* check box. You may also want to clear the *Use 2D graphics acceleration* check box, based on capabilities of your graphics card.

Note: The *Use 2D graphics acceleration* check box appears only if supported by your computer's hardware.

- d Click *OK*.

Abbreviations and acronyms

The following is a list of abbreviations and acronyms that are used in this manual.

Abbreviation/Acronym	Description
ACLA	American Clinical Laboratory Association
ABN	Advanced Beneficiary Notice
AMA	American Medical Association
AOE	Ask on Order Entry
API	Application Programming Interface
ASP	Application Service Provider
B2B	Business-to-Business
CDC	Clinical Data Compendium
CLIA	<i>Clinical Laboratory Information Act</i>
CPT®	Current Procedural Terminology
DOS	Directory of Services
EAI	Enterprise Application Integration
eDOS	Electronic Exchange of Directory of Services
EHR	Electronic Health Record
EMR	Electronic Medical Record
FQDN	Fully Qualified Domain Name
GMT	Greenwich Mean Time
HL7	Health Level Seven
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol, Secure
ICD-10	<i>International Classification of Diseases (of the World Health Organization), 10th Revision</i>
IDE	Interactive Development Environment
IPA	Independent Physician Association
J2SE	Java 2 Platform, Standard Edition
LIS	Lab Information System
LOINC	Logical Observation Identifiers Names and Codes
NPI	National Provider Identifier

Abbreviation/Acronym	Description
OERDB	(Quest Diagnostics) Order Entry Rules Database
ORM	(HL7) Order Message
ORU	(HL7) Observational Report—Unsolicited
PDF	Portable Document Format
PPMS	Physician Practice Management System
PSC	(Quest) Patient Service Center
QLS	Quest Lab Systems, which originated from QLS.
RAM	Report Always Message
REST, RESTful	Representational State Transfer
SOAP	Simple Object Access Protocol Note: As of SOAP v1.2, referred to only as an acronym.
SSL	Secure Sockets Layer
SSO	Single Sign-On
TIQ	Test In Question
TNP	Test Not Performed
UDDI	Universal Description, Discovery, and Integration
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
W3C	World Wide Web Consortium
WebDAV	Web-based Distributed Authoring and Versioning
WSDL	Web Services Definition Language
XML	eXtensible Markup Language

Related documentation

In addition to this programmer reference, the following resource is also available:

Quest Diagnostics Quantum Hub Implementation Toolkit (HIT) document. Included with the HIT, this document (*hub_toolkit.pdf*) provides details about the HIT, including a description of the sample code, sample messages, and other tools and resources provided in the HIT. For more information, including instructions for downloading the HIT, see [“Quantum Hub Implementation Toolkit” on page 8](#).

Part I: Introduction

This section provides an overview of the Quest Diagnostics Quantum Hub, as well as important guidelines for interacting with Quest when building a client application.

This section includes the following chapters:

- [Chapter 1, “Quest Diagnostics Quantum Hub”](#) beginning on page 2
- [Chapter 2, “Interfacing with Quest Diagnostics”](#) beginning on page 9

Chapter 1: Quest Diagnostics Quantum Hub

In this chapter:

- About the Quantum Hub 3
- Order submission workflow 4
- Results retrieval workflow 6
- Quantum Hub Implementation Toolkit 8

About the Quantum Hub

The Quest Diagnostics Quantum Hub provides a standards-based platform for the submission of lab orders, and for the retrieval or delivery of lab results. This section provides an overview of the Quantum Hub.

An authorized username and password are required for accessing Quantum Hub web services.

Submitting orders

The Quantum Hub provides 2 API web services for submitting and acknowledging lab orders: JAX-RS (RESTful-based) and JAX-WS (SOAP-based). Both methods support communication between an electronic medical record (EMR) application and a Quest lab for processing. They also support Advance Beneficiary Notice (ABN) requests, requisition requests, and Ask at Order Entry (AOE) questions.

For a high-level overview of the order submission workflow, see [“Order submission workflow” on the next page](#).

Receiving results

When lab results are available for the orders you have submitted, the Quantum Hub provides the following methods for receiving your results:

- **Two API web services: JAX-RS (RESTful-based) and JAX-WS (SOAP-based).** Both provide a retrieval (or “pull”) method for retrieving results from the Quantum Hub. This requires that you write a web service client application to periodically query the Quantum Hub, retrieve the results when ready, and acknowledge the retrieval of each result. You can retrieve the following lab results types from the Quantum Hub results database:
 - **HL7 results.** The client application can retrieve and acknowledge an individual results message, or a group of results messages, in HL7 format. Supported results formats include HL7 2.3, 2.3.1, and LRI 2.5.1
 - **Printable (PDF) results.** The client application can retrieve and acknowledge a Printable lab results document (in PDF)
 - **Observation results.** The client application can retrieve and acknowledge results as a bundle of HL7 messages and PDF documents. A configuration option determines the type of PDF documents (clinical, enhanced, or both) that are delivered in the HL7 bundle

Note: For a high-level overview of the results retrieval workflow, see [“Results retrieval workflow” on page 6](#).

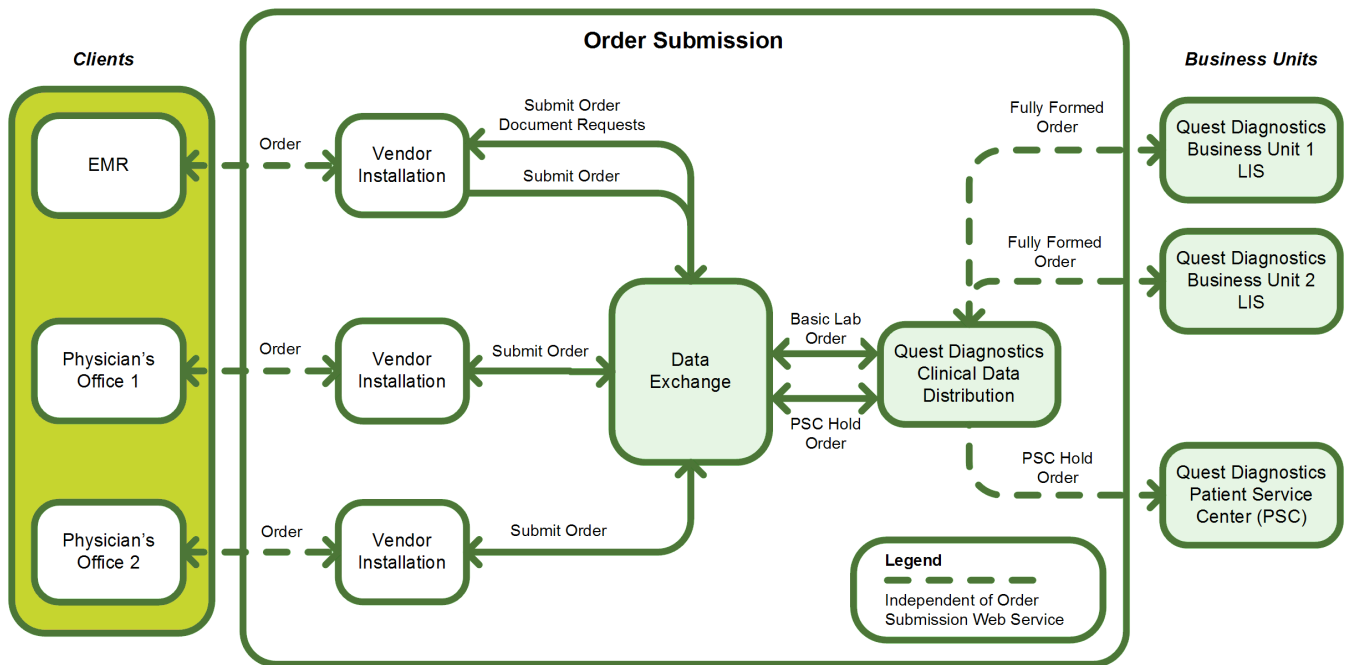
- **Results Push.** The results push method allows the Quantum Hub to deliver (or “push”) lab results to your server as soon as the results are available. When the results are on your server, you can distribute them to your clients as usual. The results push method is convenient because it delivers the lab results directly to your server via HTTPS. This method requires authentication between the Quantum Hub and your server, and it requires that an HL7 acknowledgment (ACK) message be sent to the Quantum Hub for each result you receive

Note: For details on results push, see [Chapter 14, “Push method for receiving lab results” beginning on page 430](#).

Both methods of receiving results require certification through the vendor certification process.

Order submission workflow

The Orders web services enable an EMR system to submit electronic lab orders to a Quest lab through a common and consistent web services interface. The following diagram provides a high-level overview of the components involved in Orders web service transactions, and illustrates the information flow between the Orders web services and each of the participating components.



Orders web services features

The primary features of the Orders web services include the following:

- Provide a web service application programming interface (API) that enables EMR systems to transmit fully formed order messages to a Quest laboratory information system (LIS)
- Provide a secure web-based connection between an EMR system and the Quantum Hub, as well as between the Quantum Hub and Quest business units (BUs), which are laboratories and/or Patient Service Centers
- Receive (and store for 366 days) order messages from EMR systems in a standard HL7 format
- Submit order messages to the designated Quest lab in a standard HL7 format
- Enable the direct electronic submission of Patient Service Center (PSC) hold orders, which are submitted to a Quest PSC for processing or sample collection (eg, having blood drawn) prior to final submission to the lab for testing
- Allow requests for order documents, such as order requisitions and ABN evaluations for orders with Medicare carriers
- Provide an order entry support API for business rule queries, such as: Ask at Order Entry (AOE), test codes, diagnostic codes, order edits, specimen information, and billing edits, based on a specific lab or bill type, respectively

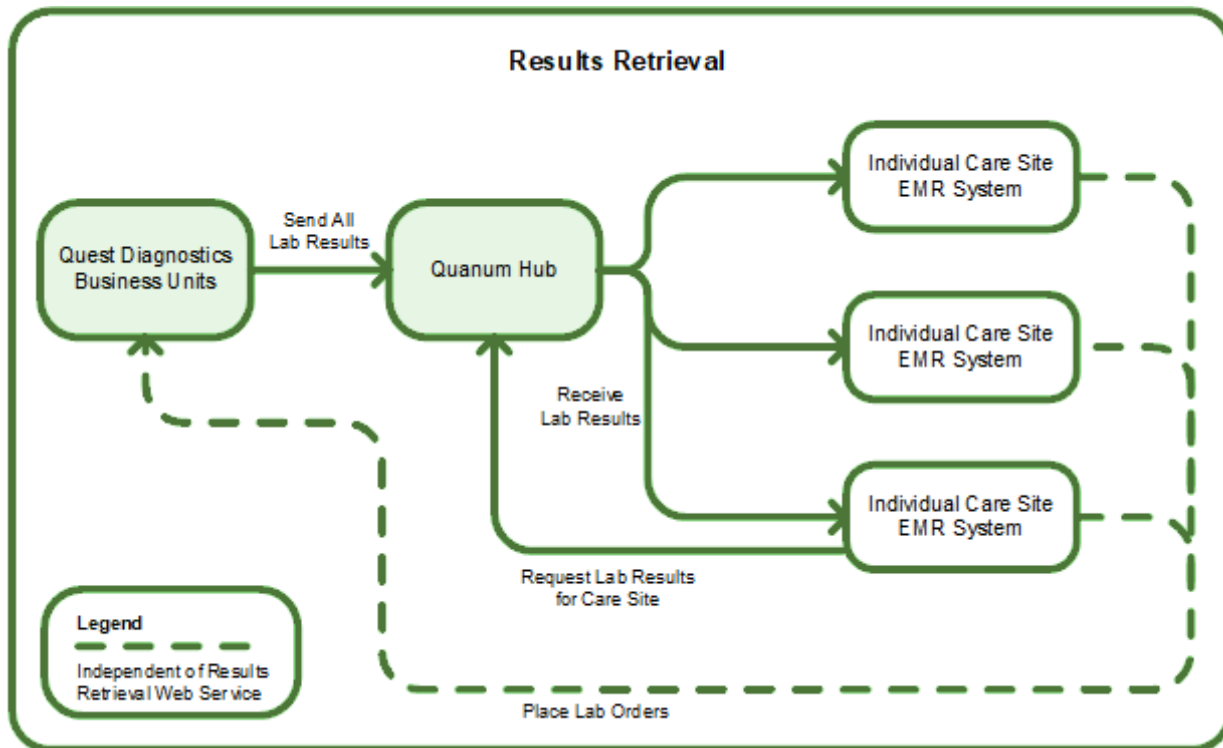
Note: For information on ordering requirements such as requisitions, specimen labels, and barcodes, see “Ordering requirements” on page 14.

For information on using the Orders web services, see [Chapter 4, “JAX-RS \(RESTful\) Order Submission web service”](#) beginning on page 37 and [Chapter 5, “JAX-WS \(SOAP\) Order Submission web service”](#) beginning on page 66.

Results retrieval workflow

The Results web services enable EMR systems to obtain lab results in HL7, Printable (PDF), or Observation format from the Quantum Hub. The Results web services expose web service methods that allow EMR systems to request lab results based on their associated Quantum Hub account. In addition, the Quantum Hub provides a means to authenticate and audit users requesting results.

The following diagram provides a high-level overview of the components involved in results retrieval transactions, and illustrates the information flow between the Results web services and each of the participating components.



Results web service features

The primary features of Results web services include the following:

- Provide a single point of access for test results
- Ensure the accurate and timely distribution of test results
- Provide a flexible interface
- Maintain an audit trail of inbound and outbound transactions with external systems
- Provide auditing and reporting services of all request and response transactions with all vendors subscribed to the Quantum Hub Information Services

Delivery of lab results

Once the Quantum Hub receives lab results from the Quest lab associated with your Quantum Hub account, the results are stored (for 90 days) and are available to be retrieved by your client application, as outlined below:

- Lab results are delivered to a care site or a physician's office through a care site EMR system. This scenario assumes that the following are true:
 - Care sites have Quantum Hub-independent processes with providers to transport orders
 - Vendors have Quantum Hub-independent processes to ensure appropriate communication and delivery mechanisms to deliver results to the appropriate care site
- The Quantum Hub delivers results to the EMR system through a request-response mechanism. The request for results must specify the authorized username and password issued by Quest, which allows the Quantum Hub to uniquely identify the entity that has sent the request

Note: For information on the options for accessing lab results, see [“Receiving results” on page 3](#).

How the Quantum Hub identifies lab data

As described in the previous sections, access to lab results is provided through an established Quantum Hub account, which represents an entity (such as an EMR vendor or physician office) that is authorized to retrieve results from the Quantum Hub. In order to retrieve data from the Quantum Hub, the calling application must provide the authorized username and password that was issued by Quest.

It is important to note that **no individual patient data** is required to be communicated to the Quantum Hub in order to complete this process—rather, the requesting client application is entirely responsible for parsing and distributing the lab results that are returned.

Quantum Hub Implementation Toolkit

The Quantum Hub Implementation Toolkit (HIT) is a companion to this programmer reference that provides additional support to vendors who are developing client applications to interact with the Quantum Hub. The HIT provides sample code, sample messages, and other tools and resources that can be used to understand how to develop a Quantum Hub client application.

For more information on the HIT, see the *Quest Diagnostics Quantum Hub Implementation Toolkit (HIT)* document (*hub_toolkit.pdf*), which appears in the root folder after you have downloaded and unzipped the HIT.

Downloading the HIT

The HIT—in addition to a number of other resources for vendors who are developing Quantum Hub client applications—is available for download from the Quantum Hub Customer Center website. Access to the Quantum Hub Customer Center website requires a valid username and password (provided by Quest).

In addition to providing access to the HIT, the Quantum Hub Customer Center website provides additional Quantum Hub-related information and resources, such as the following:

- **What's new.** A list of the latest changes and related announcements
- **Support.** Contact information for various members of the support team
- **Resources.** Downloads of the latest updates and documentation
- **FAQ.** A list of frequently asked questions and answers related to web service development (To access this page, click the *Frequently Asked Questions* link on the main page)

Download the HIT

- 1 Access the Quantum Hub Customer Center website at the following URL:
<http://custcenter.medplus.com/tech-support/hubcenter/>
- 2 When prompted, type your *username* and *password*, and then press *Enter*.
- 3 In the *Resources* area, click the *HIT* link.
- 4 When prompted, click *Save As*, and then locate the desired download directory on your hard disk. The HIT is provided as a single .zip file.
- 5 Unzip the HIT contents.

Chapter 2: Interfacing with Quest Diagnostics

In this chapter:

- Introduction 10
- Quest terminology 11
- Ordering requirements 14
- Reporting requirements 21
- Medical necessity 27

Introduction

This chapter provides basic information for vendors that are creating a Laboratory Information System (LIS) to interface with Quest Diagnostics via the Quantum Hub. It defines some of the basic terminology used throughout the process, as well as specific ordering and reporting requirements. In addition, it provides information on establishing medical necessity for the purpose of submitting Medicare reimbursement claims.

Note: For detailed specifications for formatting lab orders that are sent via the Quantum Hub for processing, see [Chapter 6, “Order HL7 2.3 specification” beginning on page 101](#), [Chapter 7, “Order HL7 2.3.1 specification” beginning on page 156](#), or [Chapter 8, “Order HL7 2.5.1 specification” beginning on page 211](#).

Quest terminology

Clarification of Quest terminology is helpful before beginning any interface discussion. If at any time during your discussions with Quest you encounter any unfamiliar terminology, ask for clarification. Understandings of terminology can vary and it is important that everyone understands the difference between systems so that the interface design meets everyone's requirements.

Regulations, protocols, and software

The following table defines the Quest terminology for the regulations, protocols, and Quest software referred to in this document.

Term	Definition
HL7	Quest Health Level Seven (HL7) documentation is based on Version 2.3 (released August 1997), Version 2.3.1 (released April 1999), and LRI 2.5.1 (released July 2012).
Clinical Laboratory Information Act (CLIA)	The <i>Clinical Laboratory Information Act (CLIA)</i> , which regulates laboratory processes and procedures. Specifically, <i>Regulation 42 CFR</i> .
Disclosure	<p>The disclosure Quest is required by CLIA to make (<i>42 CFR 493.1109 (b)</i>) to identify where laboratory testing was performed. The standard protocols do not have a field for disclosure.</p> <p>To meet the requirement, Quest designates a field as “producer defined.” For details, see the Quest specifications for your data protocol.</p>
Generic interface	An interface that uses all of the default parameters outlined in the Quest standard interface table. Some parameters can be used with the generic interface. Other parameters require a mutually satisfactory agreement with Quest and the vendor of the LIS.

Laboratory and billing

The following table describes the Quest laboratory and billing terminology referred to in this document.

Term	Definition
Advanced Beneficiary Notice (ABN)	A PDF form that notifies a patient when Medicare will not cover the costs of the ordered tests, based on an evaluation of the submitted <i>Current Procedural Terminology</i> (CPT) and ICD codes.
Ask At Order Entry (AOE)/Prompt test	<p>Order codes may have Ask at Order Entry (AOE) questions that must be sent to Quest with the orders. AOE questions provide additional information and data for calculations.</p> <p>The information/data should be sent as result records to Quest as outlined in your specific protocol converter. For details, see the specifications for your protocol.</p>

Term	Definition
Diagnosis code	The code used to describe the diagnosis, symptom, complaint, condition, or problem of a patient. Also known as <i>ICD-10 code</i> . See also " ICD-10 code " below.
ICD-10 code	<i>International Classification of Diseases, Tenth Revision</i> codes (ICD-10; also called <i>diagnosis codes</i>) are usually numeric and consist of 3–7 digits. The ICD-10 code (s) given by a physician must be consistent with the information contained in the patient's medical record for that date of service.
Messages	<p>Messages are sent as Notes and Comments (NTE) records for both HL7 Order (ORM) and HL7 Observational Report (ORU) messages.</p> <p>For ORM messages, NTE records may follow either the Patient Identifier (PID) or Observation Request (OBR) records.</p> <p>For ORU messages, NTE records may follow the PID, OBR, or Observation Result Detail (OBX) records.</p>
Non-Orderable Codes	Non-Orderable codes are those codes that are reflexively added by the placer laboratory (in this case, Quest). These tests are support tests that are more quantitative than the test ordered and are typically not necessary until indicated.
Placer facility	As used in this document, the ordering facility is always the client.
Filler facility	As used in this document, the performing facility is always <i>Quest Diagnostics</i> .
NPI	The National Provider Identifier (NPI) is a unique 10-character ID assigned by the National Provider System required for Medicare billing. It is also used as a cross-reference to the UPIN for carriers who require that information.
Profile	<p>A profile is a group of tests (component codes/tests) associated with 1 order code (also called a "test code") that has been approved by the American Medical Association (AMA) and/or Quest medical directors as consistent with standard medical practice.</p> <p>Example:</p> <p><i>Wellness Profile 1</i> (profile name)</p> <ul style="list-style-type: none"> • Lipid profile (component test) • CBC (component test) • TSH (component test) • PSA (component test) <p>By default, a profile is reported in multiple OBR segments where each OBR contains the ordered profile code. If needed, the profile code can be replaced by the individual component codes.</p> <p>Profiles can also be reported as "rolled up", where only 1 OBR segment is sent with the profile code.</p>

Term	Definition
Report Always Message (RAM)	A Report Always Message (RAM) may be attached to an OBR record or an OBX record in the form of an NTE record. It may have additional information about the test, the results, normal ranges, or how the work was performed at Quest. Like all messages, Report Always Messages are an important part of the information sent by Quest.
Resultable	The resultable is the analyte. It is described in the data protocols as the observation, or by Quest as the test code. It can be alphanumeric or a number. There is no distinction between alpha and number.
Test code	The analyte or resultable component of a unit code, which includes description, normal range, units, and result flag fields. Quest will not eliminate any of this information. Normal ranges can be unique based on patient age and sex.
Unit code	A battery or orderable code (alphanumeric characters are accepted) that contains 1 or more tests that is included on only 1 worklist.
Unit code RAM	A message attached to some unit codes and prints after the last reportable test code. An additional test code is attached to the unit code with a result of <code>null</code> . Comment records follow immediately after the test code.

Ordering requirements

The following are Quest's minimal requirements for creating an electronic order:

- **Requisitions.** An easy and quick way to generate requisitions for your orders is built into the JAX-RS and JAX-WS Order Submission web services for submitting orders to Quest labs. When you perform an order request via the JAX-RS or JAX-WS Order Submission web service, a requisition PDF file is returned that adheres to Quest requirements, ensuring that all information is available in the correct location, and that the barcodes can be successfully scanned. The consistent format and barcodes ensure that the requisition can easily be read, which reduces the cost and quality issues that arise when requisitions are not readily understood by the lab.

For information on requesting a requisition via one of the Order Submission web services, see the `getOrderDocuments` method in [“JAX-RS \(RESTful\) Order Submission web service” on page 37](#) or [“JAX-WS \(SOAP\) Order Submission web service” on page 66](#). For sample requisitions and rules for splitting requisitions, see the following:

- [“Requisition example” on the next page](#)
- [“Patient Service Center Hold requisition example” on page 16](#)
- [“Splitting requisitions ” on page 17](#)
- **Specimen identification.** See [“Specimen identification” on page 20](#)
- **Barcodes.** See [“Barcodes” on page 20](#)

Requisition example

The following is an example of a requisition generated by either the RESTful or SOAP-based Order Submission web services. For information on how the order fields are mapped to the requisition, see “Requisition form with field mapping” on page 83.


Patient Information	
TEST, TC4 4770 REGENT BLVD. IRVING, TX 75063 (972) 916-3000	
Collection Date: 09/26/2023 Time: 20:55:00	Pat ID #: 32591 SSN:
Lab Reference ID: 11072023	DOB: 01/15/1937 Sex: M
Ref Physician Provider ID: HADPANAT, NEIL Credentials: MD NPI: 1508020116	Responsible Party: Bill Type: Insurance TC4 TEST 4770 REGENT BLVD. IRVING, TX 75063 Primary Carrier: PAMC - MEDICARE OF PENNSYLVANIA Insurance #: 111111111A SSN: Group #: Relation: Self DOB: 01/15/1937 Sex: M
ICD-10 Diagnosis Code(s): E042, Z0000	
Reporting Comments: THIS IS A REPORT COMMENT LINE TWO OF LENGTH SIXTY CHARACTERS	
Internal Comments: THIS IS AN INTERNAL COMMENT LINE OF LENGTH SIXTY CHARACTERS	
Insurance Plan Name: MEDICARE Insurance Address: PO BOX 3824 DURHAM, TX 27702	
Secondary Carrier: Insurance #: 111111111A Group #: Insurance Plan Name: AETNA Insurance Address: 10101 REUNION PL SAN ANTONIO, TX 78216	
Profiles/Tests	
229 - Aldosterone, 24-Hour Urine [VARIED] [RT] TOTAL VOLUME: 1200	
496 - Hemoglobin A1c [BLOOD] [RT]	
7600 - Lipid Panel, Standard [SERUM] [RT]	
10231 - Comprehensive Metabolic Panel [SERUM] [RT]	
<u>Signature Line</u>	<u>Date</u>
	11/07/2023
Ordering provider signature, credentials and date (required by certain payers).	
End of Requisition	

Notes:

- The WS immediately following *EREQ* designates that the requisition was generated via the RESTful or SOAP-based Order Submission web services
- The information encoded in the barcode must be the *Sending Facility* number (MSH.04) and the *Placer Order Number* (ORC.02/OBR.02) separated by a dash (for example, 97502840-40252500). For more information on barcodes, see “Barcodes” on page 20
- The Quest requisition is subject to change without notice

Patient Service Center Hold requisition example

A Patient Service Center (PSC) Hold requisition is used when an order is placed without collecting a specimen, and the requisition is hand-carried by the patient to a PSC to have a specimen drawn. The following is an example of a PSC Hold requisition generated by the RESTful or SOAP-based Order Submission web services (identified by the **WS** following **PSC Hold**).

<div style="border: 1px solid black; padding: 5px; width: fit-content;"> VENDOR LOGO MAY BE INSERTED HERE </div>		 73915246-110823		Page # 1 of 1 Quest Diagnostics Incorporated <i>PSC Hold</i> WS			
Client #: 73915246 CERTIFICATION 11 1201 S COLLEGEVILLE RD COLLEGEVILLE, PA 19426-2998 555-555-5555 (P)		For Lab Use		<table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Patient Information</th> </tr> </thead> <tbody> <tr> <td> TEST, TEST #201, SECOND AVENUE IRVINE, CA 92623 (800) 899-4237 </td> </tr> </tbody> </table>		Patient Information	TEST, TEST #201, SECOND AVENUE IRVINE, CA 92623 (800) 899-4237
Patient Information							
TEST, TEST #201, SECOND AVENUE IRVINE, CA 92623 (800) 899-4237							
Collection Date: 11/08/2023 Time:		Pat ID #: 110823 SSN: xxx-xx-xxxx					
Lab Reference ID: 110823		DOB: 1/11/1990 Sex: F					
Ref Physician Provider ID: PROVIDER, TEST NPI: 1234567890		Responsible Party: 123 FIRST LINE OF ADDRESS; 567 SECOND LINE OF ADDRESS CITY, NJ 07010 PRIMARY CARRIER: SCMCR INSURANCE #: 123456789A GROUP #:		Bill Type: Client SSN: xxx-xx-xxxx Relation: Self Sex: F			
Internal Comments: INTERFACE TEST SAMPLE							
Insurance Address:							
Profiles/Tests							
243 - Amylase [SERUM] [RT]							
<u>Signature Line</u>		<u>Date</u>					
_____		11/08/2023					
Ordering provider signature, credentials and date (required by certain payers).							
End of Requisition							

Notes:

- PSC Hold requisitions must have the *EREQ* symbol removed (see [“Requisition example”](#) on the previous page), and have **PSC HOLD ORDER** printed at the top in **bold** text
- Splitting of requisitions and MLCP checking/ABN generation is not required on PSC Hold orders
- The *Receiving Facility* (MSH.05) field of the ORM message must be populated with **PSC**
- The client must be able to add a future collection date to the *Observation Date/Time* (OBR.07) field or the ORM message

Splitting requisitions

Quest requires that you split order requisitions for the following:

- Sample temperature type
- Anatomic pathology (cytology and histology) orders and clinical orders

For example, if a frozen, a refrigerated, and a cytology test are ordered for the same patient, the order needs to be split into 3 electronic orders and 3 requisitions, each with a unique Foreign System Accession Number (the placer order number value sent in ORC.02/OBR.02 in the ORM message).

Note: For PSC Hold orders, the rules for split requisitions by temperature type do not apply to clinical orders. However, anatomic pathology tests must still be split onto a separate requisition.

The examples in this section use the *Clinical Data Compendium (CDC)* as the source for the lab reference data. Where appropriate, the equivalent eDOS fields are included.

To determine temperature type and anatomic pathology tests using the CDC, use the *ORDCODE_XXX.TXT*, where **xxx** represents the Quest Lab ID. (See “[Order Code dataset](#)” on page 315 for the format of the *ORDCODE_XXX.TXT* file.) The following fields in *ORDCODE_XXX.TXT* determine how requisitions must be split:

- **Field 3 (STATE).** The field 3 values (listed below) determine how requisitions must be split. Tests with the same temperature type must be grouped together, with each temperature type on a separate requisition. The only exception is room temperature and refrigerated specimens, which may be combined on the same requisition

Note: If you are using eDOS files, requisitions can be split for temperatures based on the values in OM4.15 (*Specimen Handling Code*).

- **A:** Ambient/room temperature
- **F:** Frozen
- **FZ:** Frozen
- **G:** Groupable or refrigerated
- **H:** Handwritten requisition only
- **M:** Multiple specimen transport types possible
- **R:** Room temperature
- **RF:** Refrigerated
- **RT:** Room temperature
- **S:** Split requisition (anatomic pathology items)
- **Field 23 (PAP_IND).** If field 23 (*PAP_IND*) of *ORDCODE_XXX.TXT* is **P**, the test must print on its own requisition even if the temperature type in field 3 (*STATE*) is the same as another test

Note:

- The eDOS files are currently not populated with the fields that indicate tests for Pap or for cultures.
- All tests which contain **P** in this field should be printed on the same requisition.

For detailed examples, see the following:

- “[Example with mixed temperatures and anatomic pathology](#)” on the next page
- “[Example with mixed temperature types within a profile](#)” on page 19

Example with mixed temperatures and anatomic pathology

In this example, assume the following 5 tests were ordered for the same patient:

- 10099 - Chromosome Study—Blood
- 921 - Vitamin A, serum
- 922 - Vitamin B1, plasma
- 14499 - SUREPATH RFX HPV
- 10124 - CARDIO CRP(R)^SERUM

For each of these tests, check the corresponding field 3 in *ORDCODE_xxx.TXT*, as illustrated below:

- **10099 - Chromosome Study—Blood.** The 10099 entry in the *ORDCODE_xxx.TXT* file shows field 3 populated with RT for room temperature:

```
WDL^10099^RT^8705010099^A^MAY 17 2024 07:41PM^CHROMOSOME ANALYSIS, BLOOD (SLIDE ANALYSIS)^BLOOD^0010099^WDL^May 17 2024 07:41PM^OEAPP^RQEZ=^N^Y^EZ^^0^0^1^^^
```

- **921 - Vitamin A, serum.** The 921 entry in the *ORDCODE_xxx.TXT* file shows field 3 populated with RF for refrigerated:

```
WDL^921^RF^8705000921^A^MAY 17 2023 07:41PM^VITAMIN A^SERUM^0000921^WDL^May 17 2024 07:41PM^OEAPP^RQEZ=^N^Y^EZ^^0^0^1^^^
```

- **922 - Vitamin B1, plasma.** The 922 entry in the *ORDCODE_xxx.TXT* file shows field 3 populated with FZ for frozen:

```
WDL^922^FZ^8905000922^A^MAY 17 2024 07:41PM^VITAMIN B1, PLASMA^PLASMA-UNSPECIFIED VIAL POUR^0000922^WDL^May 17 2024 07:41PM^OEAPP^RQEZ=^N^Y^EZ^^0^0^1^^^
```

- **14499 - Surepath Rfx HPV.** The 14499 entry in the *ORDCODE_xxx.TXT* file shows field 23 populated with P for anatomic pathology. Because field 23 is populated with P, ignore the RT value in field 3.

```
WDL^14499^RT^6200014499^A^MAY 17 2023 07:41PM^SUREPATH RFX HPV^VARIED^0014499^WDL^May 17 2024 07:41PM^OEAPP^X=^N^Y^CB^P^0^0^1^^^P
```

- **10124 - Cardio CRP(R)^Serum.** The 10124 entry in the *ORDCODE_xxx.TXT* file shows field 3 populated with RT for room temperature:

```
WDL^10124^RT^4600010124^A^MAY 17 2024 07:41PM^^0010124^WDL^May 17 2024 07:41PM^OEAPP^SB=^N^Y^CB^^0^0^0^^^
```

Based on the above information, your system must split the order for the 5 tests into 4 electronic orders and 4 requisitions, each with a unique Foreign System Accession Number (the placer order number value sent in ORC.02/OBR.02 in the ORM message). Each of the requisitions is outlined below.

Requisition 1—Room temperature

The room temperature requisition would include:

- 10099 - Chromosome Study—Blood
- 10124 - Cardio CRP(R)^Serum

Requisition 2—Refrigerated temperature

The refrigerated temperature requisition would include:

- 921 - Vitamin A, serum

Requisition 3—Frozen temperature

The frozen temperature requisition would include:

- 922 - Vitamin B1, plasma

Requisition 4—Anatomic pathology

The anatomic pathology requisition would include:

14499 - Surepath Rfx HPV

Example with mixed temperature types within a profile

In some instances, the value for field 3 (*STATE*) in the *ORDCODE_xxx.txt* file may be blank, as in the following example for order code 10211:

```
AUM^10211^^8705010211^A^MAY 17 2024 07:56PM^MYASTHENIA GRAVIS PANEL 3^^0010211^AHL^
May 17 2024 07:56PM^OEAPP^RQEZ=^Y^Y^EZ^^0^0^5^^^
```

A blank in field 3 indicates that there are multiple temperature requirements within a profile. (A Y in field 14 (*PROFILE_IND*) indicates that the code is for a profile.) In this case, you must additionally check the *PROFILE_xxx.txt* file (the format of this file is outlined in “Order Code Component dataset” on page 320) for the 10211 code from the *ORDCODE_xxx.txt* file. The first temperature type found for 10211 would identify which requisition will print the order code component names (field 6) and temperatures (field 8) from within the *PROFILE_xxx.txt* file. In addition, the order code 10211 and the profile name *MYASTHENIA GRAVIS PANEL* must print on the room temperature requisition above the component names and the associated temperatures.

Notes:

- In eDOS files, the profiles are indicated by OM1.18 (*Nature of Service/Test/Observation*) in M10 (*Test/Observation Batteries*) messages. Temperatures are indicated by OM4.15 (*Specimen Handling Code*)
- The HL7 ORM message should contain the profile order code 10211 in OBR.04.4 and the profile name in OBR.04.5. No component codes or component names are to be sent in the ORM message

Below is the step-by-step process for this example of mixed temperatures within a profile:

- 1 Starting with the *ORDCODE_AHL.txt* file and the order code 10211, look for the value of field 3.

```
AUM^10211^^8705010211^A^MAY 17 2024 07:56PM^MYASTHENIA GRAVIS PANEL
3^^0010211^AHL^May 17 2024 07:56PM^OEAPP^RQEZ=^Y^Y^EZ^^0^0^5^^^
```

- 2 Field 3 is blank, so look for order code 10211 in *PROFILE_AHL.TXT*.

- 3 For each instance of 10211, look for field 8 (*State/Specimen Condition of Component Unit Code*) to determine the temperature.

```
AUM^AHL^10211^%266RQEZ^8795007550^ANTI-STRIATED MUSCLE AB SCREEN^SERUM^RT
AUM^AHL^10211^%36210RQEZ^8705037495^ANTI STRIATED MUSCLE AB TITER^SERUM^RT
AUM^AHL^10211^206RQEZ=^8705000206^ACETYLCHOLINE RECEPTOR BINDING
ANTIBODY^SERUM^RT
AUM^AHL^10211^26474RQEZ=^8705026474^ACETYLCHOLINE RECEPTOR MODULATING
ANTIBODY^SERUM^RF
AUM^AHL^10211^34459RQEZ=^8705034459^ACETYLCHOLINE RECEPTOR BLOCKING
ANTIBODY^SERUM^RT
```

- 4 Based on the first temperature type found for 10211, print the following on the room temperature requisition, placing the order code (10211) and profile name (*MYASTHENIA GRAVIS PANEL*) above the component names and associated temperatures:

```
10211 MYASTHENIA GRAVIS PANEL
ANTI-STRIATED MUSCLE AB SCREEN - specimen transport: RT
ANTI STRIATED MUSCLE AB TITER - specimen transport: RT
ACETYLCHOLINE RECEPTOR BINDING ANTIBODY - specimen transport: RT
ACETYLCHOLINE RECEPTOR MODULATING ANTIBODY - specimen transport: RF
ACETYLCHOLINE RECEPTOR BLOCKING ANTIBODY - specimen transport: RT
```

Specimen identification

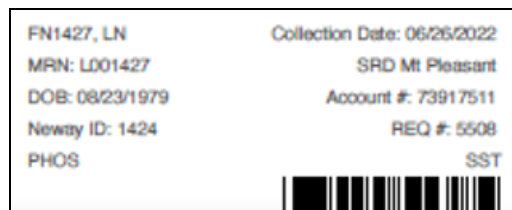
Each patient sample must have a label with the following:

- Patient name (full last name and full first name) — first identifier
- The second patient identifier must be 1 of the following:
 - Date of birth
 - Patient MRN or ID number (must also be on the corresponding requisition)
 - Order number (must also be on corresponding requisition)
 - The ordering client's Quest account number

Here are the corresponding HL7 locations for common specimen label items:

HL7 location	Specimen label item
PID.05	Patient name
PID.07	Date of birth
PID.02	Patient MRN or ID
ORC/02/OBR.02	Order number/accession number
MSH.04	Quest client account number
OBR.07	Date of collection

This is an example of a typical specimen label format:



Barcodes

Quest barcode readers can read code 39 (3 of 9) and 2 of 5 barcode formats. The barcode check digit should be turned off. In addition, the barcode should contain the start and stop characters, which are asterisks (*).

During initial discussions with Quest, the barcode printing ability should be reviewed and a sample tested for readability. A bar-coded sample will usually speed up processing of laboratory tests.

Quest will supply labels for the DYMO[®] 330, 400, 450, or 550 LabelWriter Turbo printers purchased by the vendor.

For more information on generating and printing Code 39 (3 of 9) barcodes, refer to *Code 39 Barcode Frequently Asked Questions (FAQ) and Tutorial* by IDAutomation[®] at <http://www.idautomation.com/code39faq.html#PrintingC39>.

Reporting requirements

The table below contains the basic requirements for test results reporting.

Requirement	Required by
Client account number	Quest
Patient name (no truncation)	Clinical Laboratory Information Act (CLIA) and College of American Pathologists (CAP)
Patient identifier (MRN or Patient ID)	CLIA and CAP
Quest accession number	CAP
Age and/or DOB	CAP
Gender	Quest
Ordering provider	CLIA and CAP
The collection date and time, as sent in Observation Request (OBR)	CAP
The specimen received date and time, as sent in OBR	CAP
The report date and time, as sent in OBR	CLIA and CAP
Overall report status	Quest
Report comments (no truncation)	CAP
The complete name of the test(s) performed	CLIA and CAP
Note: This must display the Quest result code name, not the LOINC code or a custom EMR/client defined name.	
The complete results as sent in Observation Result Detail (OBX) and/or Notes and Comments (NTE) following OBX	CLIA and CAP
The complete reference range, as sent in OBX	CLIA and CAP
The complete units of measure, as sent in OBX	CLIA and CAP
Abnormal flags, as sent in OBX	Quest
All test comments without truncation, as sent in NTEs after the OBX record	CLIA and CAP
The Quest pathologist's electronic signature for AP testing and cytogenics (usually a component of the ordered test)	CLIA and CAP
TNP messages, where appropriate	CLIA and CAP
If the results are corrected, they must include:	CLIA, CAP, and Quest
<ul style="list-style-type: none"> A flag (for example, =>) and a legend indicating what the flag means Previous reported results 	

Requirement	Required by
<ul style="list-style-type: none"> Date and time of previous results 	
Performing lab Information, which must include: <ul style="list-style-type: none"> The name of the lab The lab address City State Zip code The medical director's name For the state of Connecticut only, the lab license number 	CLIA and CAP
A report header on any additional pages	CLIA, CAP, and Quest
Report page indicator(s)	CLIA, CAP, and Quest

Patient record information

Quest typically includes the patient demographics in the header of the report. The minimum information displayed is patient name, age, sex, collection date/time, received date/time, and report date/time. Quest populates the patient record with the report time based on when the report was generated in the file to be picked up. All demographic fields are populated in the Quest interfaces as defined in the protocol specifications.

Quest recommends that hard copy reports include page numbers in the format n of tn , where n is the page number and tn is the total number of pages in the report. At the bottom of the last page of the report, Quest adds a line that states "Last page for *patient name*."

Performing site disclosure

Quest prints the orderable report name and performing site code on the same line. In the HL7 data record, the performing site code is used as in the following example:

```
Glucose Random                                PHL
.
.
.
Vitamin B12                                    PHL
.
.
.
      (the following lines should be entered once
      near the end of the report for each site)

KEY   SITE CODE
      PHL       Quest Diagnostics-Philadelphia
                        356 Egypt Road
                        Norristown, PA 19403

                        (END OF REPORT FOR PATIENT ONE)
```

Result record information

One or more of the following fields are populated, depending on the test:

- result
- description
- units
- normal ranges (based on patient sex and age, if applicable)
- status flags

Report example

The following is an example of a report that is generated by Quest.



Report Status: Final

TESTPAT, JOHN

Patient Information	Specimen Information	Client Information
TESTPAT, JOHN DOB: 04/04/1988 AGE: Not Given Gender: M Phone: (512) 200-0000 Patient ID: 1000000000	Specimen: SSV0114770 Requisition: TK-0505-50023 Collected: 02/01/2022 / 19:47 PST Received: 02/01/2022 / 19:47 PST Reported: 02/01/2022 / 19:47 PST	Client #: 00012312 TESTPAT, JOHN

Test Name	In Range	Out Of Range	Reference Range	Lab
LIPID PANEL, STANDARD				
LDL-CHOLESTEROL	73		mg/dL (calc)	QHO
Reference range: <100				
Desirable range <100 mg/dL for primary prevention; <70 mg/dL for patients with CHD or diabetic patients with > or = 2 CHD risk factors.				
LDL-C is now calculated using the Martin-Hopkins calculation, which is a validated novel method providing better accuracy than the Friedewald equation in the estimation of LDL-C. Martin SS et al. JAMA. 2013;310(19): 2061-2068 (http://education.QuestDiagnostics.com/faq/FAQ164)				
WHITE BLOOD CELL COUNT	8.1		3.8-10.8 Thousand/uL	
RED BLOOD CELL COUNT	4.99		4.20-5.80 Million/uL	
HEMOGLOBIN	14.3		13.2-17.1 g/dL	
HEMATOCRIT	41.8		38.5-50.0 %	
MCV	83.8		80.0-100.0 fL	
MCH	28.7		27.0-33.0 pg	
MCHC	34.2		32.0-36.0 g/dL	
RDW	13.6		11.0-15.0 %	
PLATELET COUNT	321		140-400 Thousand/uL	
NEUTROPHILS	64.9		%	
ABSOLUTE NEUTROPHILS	5257		1500-7800 cells/uL	
LYMPHOCYTES	26.1		%	
ABSOLUTE LYMPHOCYTES	2114		850-3900 cells/uL	
MONOCYTES	7.2		%	
ABSOLUTE MONOCYTES	583		200-950 cells/uL	
EOSINOPHILS	1.4		%	
ABSOLUTE EOSINOPHILS	113		15-500 cells/uL	
BASOPHILS	0.4		%	
ABSOLUTE BASOPHILS	32		0-200 cells/uL	
MPV	9.3		7.5-12.5 fL	
CHOL/HDLRATIO	3.1		<5.0 (calc)	QHO
%SBNHD				QHO
NON HDL CHOLESTEROL	90		<130 mg/dL (calc)	
For patients with diabetes plus 1 major ASCVD risk factor, treating to a non-HDL-C goal of <100 mg/dL (LDL-C of <70 mg/dL) is considered a therapeutic option.				
CHOLESTEROL, TOTAL				QHO
CHOLESTEROL, TOTAL	132		<200 mg/dL	
HDL CHOLESTEROL	42		> OR = 40 mg/dL	QHO
TRIGLYCERIDES	88		<150 mg/dL	QHO

PERFORMING SITE:

QHO QUEST DIAGNOSTICS HORSHAM, 900 BUSINESS CENTER DRIVE, HORSHAM, PA 19044-3432 Laboratory Director: [REDACTED] MD PHD. CLIA: QHO

CLIENT SERVICES:

SPECIMEN: SSV0114770

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Unit code reflex

Some result codes will reflex (that is, automatically order based on contractual agreement) unit codes when certain criteria have been met; for example, when a result is abnormal or when a combination of results exceed preset Quest Lab Systems (QLS) parameters. Your local Quest laboratory can provide you with the specific reflex parameters that they follow. The reflexed unit codes and test codes will be in the result fields as a normal request.

Do Not Report

A *Do Not Report* (DNR) result is used to suppress the reporting of an analyte, such as a comment, on the patient report.

For example:

When performing a CBC, certain morphology information will be reported only when seen by the technologist. Rather than print `None Detected` next to each possible morphology result, yielding a lengthy report, Quest enters DNR to suppress this information and only indicate those results that are found.

Billing implications of DNR

Use of a DNR does not cancel billing and therefore is not used to cancel a test not performed (see [“Test Not Performed” on the next page](#)).

Test In Question

Test In Question (TIQ) is a resultable message that is used to notify a client that an open question exists on an order that may prevent completion of all required testing. TIQ messages are not used as results for orderable test codes but are separate messages that typically appear at the end of the patient report. In some cases, requested testing is delayed until the TIQ is resolved.

Many possible conditions exist that require the entry of a TIQ. Most conditions indicate possible patient impact and immediate attention should be given to all TIQ messages.

For example: `TIQNTR`

`“The requisition has no test marked. We received the following specimens.”`

`“Green top tube Serum Separator tube.”`

Billing implications of TIQ

TIQ codes and result messages are non-billable. TIQ messages should be reviewed carefully along with other testing that appears on the patient report to determine what action should be taken by the client to resolve the question and prevent patient impact. If no action is needed (for example, the unclear handwritten order was a duplicate of testing marked on the requisition and is already in progress or completed), then no communication to Quest is required.

If the TIQ requires resolution to complete all required testing, the client should obtain the information required and contact Quest at their earliest possible convenience. The TIQ message may be suppressed from the patient record after the question has been resolved. Quest may also choose to contact the client with a phone call to resolve TIQs as needed.

Test Not Performed

Test Not Performed (TNP) is a resultable message that is used to notify a client that a test or any portion of a test was not performed. A TNP message can cancel all or part of an order code, regardless of whether the order code is a single unit code or profile.

Many possible conditions exist in QLS to cause this result. TNP results may be replaced with valid results during a later transmission.

For example: TNP/130

“Test not performed. Specimen quantity not sufficient to perform the test requested.”

Billing implications of TNP

When an entire unit code is canceled due to a TNP message, all charges for that unit code are flagged as “no charge” in the Quest billing system. All billing charges for that unit code will be canceled. If the unit code or profile is partially canceled with a TNP message, the Quest billing system will adjust the billing to bill only for those tests performed.

A TNP should trigger a special handling condition on the vendor’s system that will alert the client to the exception and indicate that a billing adjustment will need to be made. The patient report should reflect the TNP—that testing was not performed by Quest.

Medical necessity

To ensure that Medicare is reimbursing only reasonable and necessary services, each local Medicare carrier has instituted Limited Coverage Policies (LCP) for specific diagnostic tests. Medicare will pay only for the services that it determines to be medically necessary under section 1862(a)(1) of the *Social Security Act*. The LCPs spell out specific diagnosis requirements for each test covered. If 1 of these specified ICD-10 codes is not listed on a requisition, Medicare will not pay for that test.

In addition, Medicare has indicated that payment will also be denied if a test is non-FDA approved or considered experimental. It is expected that other carriers will follow suit and institute LCPs of their own. To notify a patient of a LCP, an Advance Beneficiary Notice (ABN) is to be produced for any of these conditions.

ABN forms

To account for these requirements, any requisitions for LCP tests or tests that are non-FDA approved must properly indicate such. LCP tests that are ordered and that are not substantiated with a covered ICD-10 code or a signed ABN form must accompany non-FDA-approved tests that are ordered. Checks should be performed by the ordering system to identify the need for an ABN form on each requisition. All diagnosis information supplied must be consistent with the patient's medical record.

Orders with Medicare carriers can be submitted for ABN evaluation without actually submitting the order for lab processing. If the order requires an ABN, 2 copies of the ABN form (see [“ABN form example” on the next page](#)) are returned in a single PDF file. Otherwise, a message is returned stating that an ABN is not required. For information on submitting an order for ABN evaluation, see the `getOrderDocuments` method in [“JAX-RS \(RESTful\) Order Submission web service” on page 37](#) or [“JAX-WS \(SOAP\) Order Submission web service” on page 66](#).

ABN form example

The following is an example of a completed ABN form.

Notifier(s): Quest Diagnostics - East Region 1 Insights Drive, Clifton, NJ 07012 862-349-2000			
Patient Name: TEST, TC4		Identification Number: 11072023	
ADVANCE BENEFICIARY NOTICE OF NONCOVERAGE (ABN)			
NOTE: If Medicare doesn't pay for items checked or listed in the box below, you may have to pay. Medicare does not pay for everything, even some care that you or your health care provider have good reason to think you need. We expect Medicare may not pay for the items listed or checked in the box below			
Listed or Checked Items Only:	496 Hemoglobin A1c (\$81.68) 7600 Lipid Panel, Standard -334 CHOLESTEROL, TOTAL (\$42.90) -608 HDL-CHOLESTEROL (\$73.00) -896 TRIGLYCERIDES (\$47.01)	496 Hemoglobin A1c (\$81.68) 7600 Lipid Panel, Standard -334 CHOLESTEROL, TOTAL (\$42.90) -608 HDL-CHOLESTEROL (\$73.00) -896 TRIGLYCERIDES (\$47.01)	
Reason Medicare May Not Pay:	Medicare does not pay for these tests for your condition	Medicare does not pay for these tests as often as this (denied as too frequent)	
Estimated Cost:	\$244.59	\$244.59	
WHAT YOU NEED TO DO NOW: <ul style="list-style-type: none"> ▪ Read this notice, so you can make an informed decision about your care. ▪ Ask us any questions that you may have after you finish reading. ▪ Choose an option below about whether to receive the checked items listed in the first box above. 			
Note: If you choose Option 1 or 2, we may help you to use any other insurance that you might have, but Medicare cannot require us to do this.			
Options: Check only one box. We cannot choose a box for you.			
<input type="checkbox"/> OPTION 1. I want the laboratory test listed above. You may ask to be paid now, but I also want Medicare billed for an official decision on payment, which is sent to me on a Medicare Summary Notice (MSN). I understand that if Medicare doesn't pay, I am responsible for payment, but I can appeal to Medicare by following the directions on the MSN. If Medicare does pay, you will refund any payments I made to you, less co-pays or deductibles.			
<input type="checkbox"/> OPTION 2. I want the laboratory test listed above, but do not bill Medicare. You may ask to be paid now as I am responsible for payment. I cannot appeal if Medicare is not billed.			
<input type="checkbox"/> OPTION 3. I don't want the laboratory test listed above. I understand with this choice I am not responsible for payment, and I cannot appeal to see if Medicare would pay.			
Additional Information: (e)			
This notice gives our opinion, not an official Medicare decision. If you have other questions on this notice or Medicare billing, call 1-800-MEDICARE (1-800-633-4227/ TTY: 1-877-486-2048). Signing below means that you have received and understand this notice. You also receive a copy.			
Signature:		Date:	
CMS does not discriminate in its programs and activities. To request this publication in an alternative format, please call: 1-800-MEDICARE or email: AltFormatRequest@cms.hhs.gov.			
According to the Paperwork Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0938-0596. The time required to complete this information collection is estimated to average 7 minutes per response, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have comments concerning the accuracy of the time estimate or suggestions for improving this form please write to CMS, 7500 Security Boulevard, Attn: PIRA Reports Clearance Officer, Baltimore, Maryland 21244-1850. Form CMS-R-131 (Exp. 9/1/28/2028)			
			Form Approved OMB No. 0938-0596

The ABN form can be obtained online at <https://www.cms.gov/medicare/forms-notices/beneficiary-notices-initiative>.

Note: The form CMS-R-131 must be used.

Requirements

The following is a list of the specific LCP diagnosis requirements for each test covered:

- Allow up to 12 ICD-10 codes at the requisition level
- When creating a requisition, diagnosis codes must be specifically selected
- Verify whether or not a test code selected by a client could be billed using CPT covered by the carrier under an LCP. If it is covered under an LCP, the test should be so noted on the printed requisition
- If a test is covered under an LCP, verify that 1 of the diagnosis codes supplied by the client matches 1 of the diagnosis codes for each CPT covered by an LCP. If any CPT does not have a match, an ABN must be signed by the patient and sent with the order
- Verify whether or not a test code selected by a client is for a test which is non-FDA approved. If it is non-FDA approved, an ABN must be signed by the patient and sent with the order
- If an ABN is required for a requisition, add test code 21799 to the list of tests ordered both electronically and on the printed requisition. This code signals special processing by Quest and will not be resultated or reported

Chapter 3: OAuth 2.0 authentication

In this chapter:

About OAuth 2.0	31
OAuth 2.0 for JAX-RS (RESTful) and JAX-WS (SOAP) web services	32
OAuth 2.0 URLs and endpoints	34

About OAuth 2.0

OAuth 2.0 is an authorization framework that enables applications to obtain limited access to user accounts on an HTTP service. It delegates user authentication to the service that hosts the user account and authorizes third-party applications to access that user account.

This provides instructions for configuring clients who want to use OAuth 2.0 authentication to push orders and/or results from the Quantum Hub to their client application using the configuration details they provided in their vendor information form.

OAuth 2.0 for JAX-RS (RESTful) and JAX-WS (SOAP) web services

This section explains how to perform API calls which require OAuth 2.0 authentication. These are used in order submissions and results retrieval, among other tasks. Examples, URLs, and endpoints are provided for your reference.

Getting a token

- 1 First, request an access token from the Quantum Hub.

Note: If Quest has already assigned a valid token to you, skip this step.

- 2 Make a POST call with the client application to the following URL:

```
POST /hub-authorization-server/oauth2/token HTTP/1.1
```

Include the following in the request header:

```
grant_type=client_credentials
client_id=Quantum user name
client_secret=Password
```

Value	Description
grant_type	This is the client_credentials.
client_id	This is the Quantum user ID.
client_secret	This is the Quantum password.

Note: You must have a valid Quantum user ID and password (issued by Quest) in order to get a valid token.

After requesting an access token, you'll receive 1 of the following responses:

- **If the request is successful:**

```
HTTP/1.1 200 OK
Cache-Control: no-store
Pragma: no-cache
Content-Type: application/json
Transfer-Encoding: chunked
Keep-Alive: timeout=60
Connection: keep-alive
{"token_type":"Bearer","access_token":"eyJ0eXAiOiJKV1QiLCJh
(truncated)","expires_in":60,"scope":"hub"}
```

Note: When a token expires, you must generate a new one. By default, tokens are valid for 60 seconds.

- **If the `client_id` or `client_secret` is incorrect or missing:**

```
400 Bad Request
{ "error": "invalid_client" }
```

Note: If you attempt to access the Get Token web services using an invalid `client_id` or `client_secret` multiple times without a successful authorization, your user account will be locked out for several minutes. You can retry accessing the web services after the lockout period expires.

Example HTTP request

Web service multipart/form-data

```
POST /hub-authorization-server/oauth2/token HTTP/1.1
Accept: */*
Cache-Control: no-cache
Content-Type: multipart/form-data; boundary=boundary
Content-Length: LENGTH_VALUE
--boundary
Content-Disposition: form-data; name="grant_type"
client_credentials
--boundary
Content-Disposition: form-data; name="client_id"
CLIENT_ID_VALUE
--boundary
Content-Disposition: form-data; name="client_secret"
CLIENT_SECRET_VALUE
--boundary--
```

Web service request application-www-form-urlencoded

```
POST /hub-authorization-server/oauth2/token HTTP/1.1
Accept: */*
Cache-Control: no-cache
Content-Type: application/x-www-form-urlencoded
Content-Length: LENGTH_VALUE
grant_type=client_credentials&client_id=CLIENT_ID_VALUE&client_secret=CLIENT_SECRET_VALUE
```

Web service response body for both

```
Cache-Control: no-store
Pragma: no-cache
Content-Type: application/json
Transfer-Encoding: chunked
Keep-Alive: timeout=60
Connection: keep-alive
{"token_type": "Bearer", "access_token": "eyJ0eXAiOiJKV1QiLCJh( truncated )", "expires_in": 60, "scope": "hub"}
```

Submitting an API web service call with a token

After receiving a response, use the token with your web service call in the authorization HTTP header of the request message.

URL

```
POST /hub-resource-server/oauth2/order/submission
POST /hub-resource-server/oauth2/order/document
POST /hub-resource-server/oauth2/result/getProviderAccounts
POST /hub-resource-server/oauth2/result/getResults
POST /hub-resource-server/oauth2/result/acknowledgeResults
POST /hub-resource-server/oauth2/result/getInteractiveInsightsReport
GET /oauth2/compendium/requestCompendiums
GET /oauth2/compendium/requestCompendiums/{type}
GET /oauth2/compendium/retrieveCompendium/{transactionUID}/{fileName}
GET /oauth2/compendium/verifyCompendiumsAccess
GET /oauth2/compendium/ackCompendium/{transactionUID}/{fileName}
```

Request header

```
Authorization: Bearer eyJ0eXAIoiJKV1QiLCJh (truncated)
Accept: */*
Accept-Encoding: gzip, deflate, br
```

Possible errors in the response

```
{
  "error": "invalid_request",
  "timestamp": 1613665155531
}
{
  "error": "The token is not valid",
  "timestamp": 1613665201435
}
```

OAuth 2.0 URLs and endpoints

Required input

To use the Certification or Production environments, you must provide:

Value	Description
client_id	This is the client username.
client_secret	This is the client password.
grant_type	client_credentials are assumed, if not otherwise specified.

HL7 response

The HL7 acknowledgment payload will be structured as follows:

```
MSH|^~\&|QLS|97502841||TPH^31D0696246^CLIA|202411010911||ACK|20240401091127968|D|2.3  
MSA|CA|800000000000001682641
```

Certification environment

Use the following URLs to connect to the Certification environment:

Component	Setting
Token	https://certhubservices.quantum.com/hub-authorization-server/oauth2/token
Orders	https://certhubservices.quantum.com/hub-resource-server/oauth2/order/submission
Results	https://certhubservices.quantum.com/hub-resource-server/oauth2/result/getResults
Results Acknowledgment	https://certhubservices.quantum.com/hub-resource-server/oauth2/result/acknowledgeResults

Production environment

Use the following URLs to connect to the Production environment:

Component	Setting
Token	https://hubservices.quantum.com/hub-authorization-server/oauth2/token
Orders	https://hubservices.quantum.com/hub-resource-server/oauth2/order/submission
Results	https://hubservices.quantum.com/hub-resource-server/oauth2/result/getResults
Results Acknowledgment	https://hubservices.quantum.com/hub-resource-server/oauth2/result/acknowledgeResults

Part II: Order submission

This section provides detailed information necessary for creating a client application to interact with the Quantum Hub to submit lab orders.

This section includes the following chapters:

- Chapter 4, “JAX-RS (RESTful) Order Submission web service” beginning on page 37
- Chapter 5, “JAX-WS (SOAP) Order Submission web service” beginning on page 66
- Chapter 6, “Order HL7 2.3 specification” beginning on page 101
- Chapter 7, “Order HL7 2.3.1 specification” beginning on page 156
- Chapter 8, “Order HL7 2.5.1 specification” beginning on page 211
- Chapter 9, “Retrieve Test Compendium web service API reference” beginning on page 280
- Chapter 10, “Clinical Data Compendium” beginning on page 299
- Chapter 11, “eDOS laboratory test compendium framework” beginning on page 332

Chapter 4: JAX-RS (RESTful) Order Submission web service

In this chapter:

- About the JAX-RS (RESTful) Order Submission web service 38
- Best practices for using the JAX-RS Order Submission web service 39
- JAX-RS (RESTful) web service methods 40
- HL7 fields for getOrderDocument requests 49
- Sample order requests and responses 55
- Acknowledgment of submitted orders 59
- JAX-RS web service endpoints 65

About the JAX-RS (RESTful) Order Submission web service

This chapter provides details about the JAX-RS order submission API. JAX-RS uses a Representational State Transfer (RESTful) web protocol, which complies with the *Java API for RESTful Web Services* (JAX-RS 2.0) specification (*JSR-311*). It facilitates submitting lab orders to a Quest Diagnostics lab for processing, and acknowledging those orders.

JAX-RS supports the following request types, submitted either separately, or in any combination:

- **ABN.** Submitting a lab order for Advance Beneficiary Notice (ABN) evaluation, prior to submitting the order to the lab for processing. If an ABN is required, 2 copies of the ABN are returned
- **AOE.** Submitting a lab order for an Ask at Order Entry (AOE) question evaluation, prior to submitting the order to the lab for processing. If 1 or more order codes require AOE questions to be answered, a URL is returned allowing the user to do so prior to resubmitting the order; otherwise, the order is automatically sent to the lab
- **REQ.** Submitting a lab order for a requisition (REQ) request. If the corresponding requisition generates without error, the requisition is returned, and the order is automatically sent to the lab (unless submitted in combination with an AOE request that requires AOE questions to be answered)

To access this web service using OAuth 2.0 authentication, a valid OAuth2 token is required.

For details on the potential response(s) from each request type when submitted separately, or in any combination, see [“Potential responses for getOrderDocument requests” on page 46](#).

For more information

- For details about the JAX-RS web service, see [“JAX-RS \(RESTful\) web service methods” on page 40](#)
- For information about the acknowledgment of submitted orders, see [“Acknowledgment of submitted orders” on page 59](#)
- For information about accessing the endpoints, see [“JAX-RS web service endpoints” on page 65](#)
- For HL7 order message specifications, see [Chapter 6, “Order HL7 2.3 specification” beginning on page 101](#), [Chapter 7, “Order HL7 2.3.1 specification” beginning on page 156](#), or [Chapter 8, “Order HL7 2.5.1 specification” beginning on page 211](#)

Best practices for using the JAX-RS Order Submission web service

This section describes the best practices that you should follow when creating a client application to interact with the JAX-RS (RESTful) Order Submission web service. Following these best practices will help minimize any technical or performance issues that might otherwise result from invalid or inappropriate use of the web service.

- **Submit individual orders only.** You must submit HL7 orders to the JAX-RS web service 1 at a time. Multiple HL7 messages can be sent for multiple patients; however, they must be submitted 1 at a time. Your client application does not need to disconnect from the web service, but each order must be sent individually using the [submitOrder](#) method. Your client application should reuse the same connection when making concurrent calls to avoid impacting system performance
- **Do not submit a duplicate order.** Do not submit the same order message to the Quantum Hub more than once; duplicate orders are ignored by the Quantum Hub, but may impact system performance. An order number must be unique per Quest account
- **Do not resubmit an invalid order.** If you submit an order message to the Quantum Hub that returned a negative acknowledgment (NAK) message indicating the content of the message was invalid, do not resubmit the same message without first analyzing and correcting the data error

Note: For more information about acknowledgment (ACK) and negative acknowledgment (NAK) messages that are returned by the Quantum Hub, see [“Acknowledgment of submitted orders” on page 59](#).

JAX-RS (RESTful) web service methods

This section provides details on the methods and parameters provided by the JAX-RS web service API. Order methods include the following:

- “submitOrder” below
- “getOrderDocument” on the next page

submitOrder

The submitOrder method allows you to submit a Base64-encoded order HL7 message to the Quantum Hub. The order can be either a basic lab order or a Patient Service Center (PSC) Hold order.

Endpoint

You must use the HTTP POST method to submit orders to the endpoint shown below, where *domain* specifies the Quantum Hub environment. For the complete uniform resource identifier (URIs) for each of the Quantum Hub environments, see “JAX-RS web service endpoints” on page 65.

```
POST https://domain/hub-resource-server/oauth2/order/submission
```

Request specifications

This is the Base64-encoded order HL7 message. Even though an inbound lab order message may be accepted by the Quantum Hub, it still may ultimately be rejected by the performing lab.

Note: For HL7 order messages specifications, see Chapter 6, “Order HL7 2.3 specification” beginning on page 101, Chapter 7, “Order HL7 2.3.1 specification” beginning on page 156, or Chapter 8, “Order HL7 2.5.1 specification” beginning on page 211.

The request is formatted as text/plain and uses a message body string.

Request parameter descriptions

There are no applicable parameter descriptions for the above specifications.

Response specifications

This is the Base64-encoded order acknowledgment (ACK) HL7 message.

Note: For ACK HL7 message specifications, see “Acknowledgment of submitted orders” on page 59.

The request is formatted as text/plain and uses a message body string.

Response parameter descriptions

There are no applicable parameter descriptions for the above specifications.

HTTP response codes

The following table lists the possible HTTP response codes for the `submitOrder` method.

Note: Specific information is included with the HTTP response code.

Response code	Definition
200	The request was completed successfully.
400	The request was not properly constructed.
401	The user credentials are not authorized.
403	The user does not have permission for the order service.
404	The requested endpoint was not found.
500	An internal server error occurred.

getOrderDocument

The `getOrderDocument` method allows you to request order documents and/or AOE questions for the accompanying order, as follows:

- **ABN.** This determines whether or not an ABN is required. If an ABN is required, 2 copies of the ABN are returned in a PDF file. The order is **not** forwarded on for processing, regardless of whether or not an ABN is required. For an explanation of ABNs, see [“ABN forms” on page 27](#) and for a sample ABN, see [“ABN form example” on page 28](#)
- **AOE.** This determines whether or not Ask at Order Entry (AOE) questions are required for the submitted order codes. If AOE questions **are** required, a URL is returned (that can be presented to the client application user to answer the associated AOE questions), and the order is **not** forwarded on for processing. After the user answers the AOE questions, the client application resubmits the order, which the Quantum Hub combines with the associated questions and answers before submitting to the lab for processing
- **REQ.** This creates a requisition for the accompanying order, returns the requisition in a PDF file, and forwards the order to the lab for processing (unless submitted in combination with an AOE request that requires AOE questions to be answered). For a sample requisition, see [“Requisition form with field mapping” on page 54](#)

For details on the potential response(s) from each request type when submitted separately, or in any combination, see [“Potential responses for getOrderDocument requests” on page 46](#).

Endpoint

You must use the HTTP POST method to request order documents from the endpoint shown below, where *domain* specifies the Quantum Hub environment. (For the complete URIs for each of the Quantum Hub environments, see [“JAX-RS web service endpoints” on page 65](#).)

POST `https://domain/hub-resource-server/oauth2/order/document`

Request specifications

This is the Base64-encoded order HL7 and an array of order document types. Even though an inbound lab order message may be accepted by the Quantum Hub, it still may ultimately be rejected by the performing lab.

Note: For details on formatting the order HL7 message fields that are used for ABN and requisition requests, see [“HL7 fields for getOrderDocument requests” on page 49](#).

For HL7 order message specifications, see [Chapter 6, “Order HL7 2.3 specification” beginning on page 101](#), [Chapter 7, “Order HL7 2.3.1 specification” beginning on page 156](#), or [Chapter 8, “Order HL7 2.5.1 specification” beginning on page 211](#).

The request is formatted as application/json.

Request parameters

Parameter	Data type	Req'd ^a	Description/attributes
documentTypes	String[]	R	The array of order document types requested (ABN, REQ, and/or AOE).
orderHl7	String	R	The Base64-encoded HL7 order message.

Request example

```
{
  documentTypes: [
    string
  ]
  orderHl7: string
}
```

Response specifications

This is the Base64-encoded order acknowledgment (ACK) HL7 and the requested documents.

Note: For details on the potential response(s) from each request type when submitted separately, or in any combination, see [“Potential responses for getOrderDocument requests” on page 46](#).

For ACK HL7 message specifications, see [“Acknowledgment of submitted orders” on page 59](#).

The request is formatted as application/json.

Response parameters

Fields that are not supported appear in *gray text* in the table.

^aR = Required, O = Optional, C = Conditional.

Parameter	Data type	Req'd ^a	Description/attributes
ackhl7	String	O	<p>The Base64-encoded HL7 ACK message.</p> <p>For formatting details, see “Acknowledgment of submitted orders” on page 59.</p>
orderSupportDocuments	orderSupportDocuments[]	O	<p>The array of order documents generated and returned as a result of the request.</p>
documentType	String	R	<p>The type of order document returned (ABN, REQ, AOE, AOEURL, or AOEORDER).</p> <p>ABN, REQ, and AOE may appear in any combination, separated by a hyphen.</p> <p>Note: Refer to documentData for a description of what is returned for each response type.</p>
documentData	Byte[]	O	<p>The array of Base64-encoded PDF files returned that includes 1 or more of the following, based on the documentType value shown:</p> <ul style="list-style-type: none"> • ABN. Two copies of an ABN • REQ. A requisition • AOEURL. The URL to access the AOE questions <ul style="list-style-type: none"> Note: AOEURL is applicable only for an initial AOE request, when AOE questions are required for the submitted order codes • AOEORDER. A copy of the complete order, including the AOE questions and answers <ul style="list-style-type: none"> Note: AOEORDER is applicable only after the AOE questions are answered, either on the original order, or via the URL returned from the initial request
requestStatus	String	O	<p>The status of a getOrderDocument request. See “Request status codes” on page 45 for specific request status codes.</p> <p>Note: Not applicable for AOE.</p>

^aR = Required, O = Optional, C = Conditional.

Parameter	Data type	Req'd ^a	Description/attributes
responseMessage	String	0	<p>This includes 1 or more of the following strings (if the getOrderDocument request was successful):</p> <ul style="list-style-type: none"> • ABN is not required • ABN is required • REQ OK • Ordercodes requiring an answer: <i>nnnn; nnnn;...; AOE</i> URL = <i>http://address...</i> <p>When an ABN is required and/or a requisition was requested: a PDF file containing the corresponding document(s) is returned in the documentData response.</p> <p>When AOE questions are required: the response message includes the order codes requiring AOE questions and answers, and a URL for accessing the associated questions.</p> <p>If the getOrderDocument request was not successful, the responseMessage contains the error message from the Quantum Hub.</p>
status	Boolean	0	This indicates if the getOrderDocument request was successful (TRUE) or not (FALSE).
misc	String	0	The array of name/value pairs.
cdaRepresentation	N/A	N/A	N/A (Reserved for future use)

^aR = Required, 0 = Optional, C = Conditional.

Response example

```
{
  ackhl7: string
  orderSupportDocuments:[
    {
      responseMessage: string
      requestStatus: string
      documentType: string
      status: string
      cdaRepresentation: string
      documentData:[
        byte
      ]
      misc:[
        {
          name: string
          value: string
        }
      ]
    }
  ]
}
```

Request status codes

The following table shows status codes that can be returned via the [requestStatus](#) parameter in response to a [getOrderDocument](#) request.

Code	Description
0000: Processing completed successfully	The order request completed successfully.
1030: Invalid request data: Performing Site (<i>value</i>)	The value in MSH.06 (<i>Receiving Facility</i>) is incorrect. Ensure that the value is the three-letter ID of the facility that performs the test.
1030: Invalid request data: Diagnosis Code (<i>value</i>)	The value in DG1.03 is incorrect.
1030: Invalid request data: Order Code (<i>value</i>)	The value in OBR.04 is incorrect.
1040: Incomplete request data: Carrier	Values for IN1.03 (<i>Insurance Company ID</i>), IN1.04 (<i>Insurance Company Name</i>), and/or IN1.05 (<i>Insurance Company Address</i>) are missing.
1040: Incomplete request data: Last Name	PID.05 (<i>Patient Name</i>) is missing a value in PID.05.01. Both first and last names are required in PID.05.
1050: Maximum number of ICD codes exceeded	The maximum number of ICD codes allowed per order is 12.
1070: Unable to contact IMDB	The <i>Insurance Map Database</i> (IMDB) is not available, so the request cannot be processed.

HTTP response codes

The following table lists the possible HTTP response codes for the `getOrderDocument` method.

Note: Specific information is included with the HTTP response code.

Response code	Indicates
200	The request was completed successfully.
400	The request was not properly constructed.
401	The user credentials are not authorized.
403	The user does not have permission for the order service.
404	The requested endpoint was not found.
500	An internal server error occurred.

Potential responses for `getOrderDocument` requests

The following table describes the potential response(s) from each `getOrderDocument` request type when submitted separately, or in any combination.

Request type(s)	Response(s)	Order submitted?	Included in response
ABN only	ABN not required	No	No PDF file is returned.
	ABN required	No	Two copies of the ABN are returned in a PDF file.
REQ only	REQ created	Yes	The requisition is returned in a PDF file.
AOE only	AOE not required, or already answered	Yes	The original order's HL7 returned, including AOE questions and answers (if required). No URL is returned.
	AOE required	No	A URL is returned and the user must answer AOE questions and then resubmit the order.
ABN-REQ	ABN not required REQ created	Yes	The requisition is returned in a PDF file.
	ABN required REQ created	Yes	Two copies of the ABN and 1 copy of the requisition are returned in a single PDF file.
ABN-AOE	ABN not required AOE not required, or already answered	Yes	The original order's HL7 is returned, including AOE questions and answers (if required). No URL or PDF file is returned.

Request type(s)	Response(s)	Order submitted?	Included in response
	ABN not required AOE required	No	A URL is returned; the user must answer AOE questions and then resubmit the order. No PDF file is returned.
	ABN required AOE not required, or already answered	Yes	Two copies of the ABN, as well as AOE questions and answers (if required), are returned in a PDF file. The original order's HL7 is returned, including AOE questions and answers (if required). No URL is returned.
	ABN required AOE required	No	Two copies of the ABN are returned in a PDF file. A URL is returned; the user must answer AOE questions and then resubmit the order.
AOE-REQ	REQ created AOE not required, or already answered	Yes	The requisition, including AOE questions and answers (if required), is returned in a PDF file. The original order's HL7 is returned, including AOE questions and answers (if required). No URL is returned.
	REQ created AOE required	No	The requisition is returned in a PDF file. A URL is returned; the user must answer AOE questions and then resubmit the order.
ABN-AOE-REQ	ABN not required REQ created AOE not required, or already answered	Yes	The requisition, including AOE questions and answers (if required), is returned in a PDF file. The original order's HL7 is returned, including AOE questions and answers (if required). No URL is returned.
	ABN not required REQ created AOE required	No	The requisition is returned in a PDF file. A URL is returned; the user must answer AOE questions and then resubmit the order.
	ABN required REQ created AOE not required, or already answered	Yes	Two copies of the ABN and 1 copy of the requisition, including AOE questions and answers (if required), are returned in a single PDF file. The original order's HL7 is returned, including AOE questions and answers (if required). No URL is returned.

Request type(s)	Response(s)	Order submitted?	Included in response
	ABN required REQ created AOE required	No	Two copies of the ABN and 1 copy of the requisition are returned in a single PDF file. A URL is returned; the user must answer AOE questions and then resubmit the order.
Any Type or Combination	Error message	No	No PDF file, order HL7, or URL is returned.

HL7 fields for getOrderDocument requests

The following table shows the HL7 order message fields that are used for `getOrderDocument` requests; it does not show all of the fields required for a complete and valid order. When using this table, note the following:

- Order messages submitted for ABN documents need only a subset of the fields required for a complete and valid order
- Order messages submitted for AOE and/or requisition requests are forwarded to the lab for processing, so they must be complete and valid orders as defined in [Chapter 6, “Order HL7 2.3 specification” beginning on page 101](#), [Chapter 7, “Order HL7 2.3.1 specification” beginning on page 156](#), or [Chapter 8, “Order HL7 2.5.1 specification” beginning on page 211](#)

In the table:

- **R** (*Required*) indicates that the field is required for the request to be processed
- **O** (*Optional*) indicates that the field is optional for the request to be processed
- **C** (*Conditional*) indicates that the field is conditional and is required under certain circumstances, as explained in the *Comments* column

For a visual display of the requisition with a mapping of the fields, see [“Requisition form with field mapping” on page 54](#).

HL7 ORM field	ABN	AOE/REQ	Comments
MSH.04 (<i>Sending Facility</i>)	R	R	Your account number as assigned by Quest.
MSH.05 (<i>Receiving Application</i>)	O	C	This field determines whether the requisition is for a basic lab order or a PSC Hold order, as follows: <ul style="list-style-type: none">• A blank value indicates a basic lab order, and the <i>EREQ</i> logo appears in the upper-right corner of the requisition• A value of PSC indicates a PSC Hold order, and the <i>PSC Hold</i> logo appears in the upper-right corner of the requisition
MSH.06 (<i>Receiving Facility</i>)	R	R	The value in MSH.06 does not appear on the requisition, but it is used to generate the performing site information that appears on the requisition.
MSH.12 (<i>Version ID</i>)	R	R	This is one of the following versions: 2.3, 2.3.1, or 2.5.1.
PID.02 (<i>Patient ID (External ID)</i>)	O	R	Note: If you are using Orders 2.3.1 or 2.5.1, PID.03 is also required.
PID.05 (<i>Patient Name</i>)	R	R	This appears in the <i>Patient Information</i> section on the requisition. The last name (PID.05.01) and first name (PID.05.02) are required; the middle initial (PID.05.03) is optional.

HL7 ORM field	ABN	AOE/REQ	Comments
PID.07 (<i>Date of Birth</i>)	0	0	Note: If the date value is invalid, it will not be printed on the requisition.
PID.08 (<i>Sex</i>)	0	0	This appears in the <i>Sex</i> field on the requisition below the <i>Pat ID #</i> . Note: If the sex value is invalid, it will not be printed on the requisition.
PID.11 (<i>Patient Address</i>)	0	0	This appears in the <i>Patient Information</i> section on the requisition.
PID.13 (<i>Phone Number - Home</i>)	0	0	This appears in the <i>Patient Information</i> section on the requisition.
PID.19 (<i>SSN Number - Patient</i>)	0	0	This appears in the <i>SSN</i> field on the requisition to the right of the <i>Pat ID #</i> .
PV1.03 (<i>Assigned Patient Location</i>)	0	0	This appears below the patient <i>DOB</i> on the requisition, as follows: <ul style="list-style-type: none"> • PV1.03.01 is labeled as <i>Ward</i> • PV1.03.02 is labeled as <i>Room</i> • PV1.03.03 is labeled as <i>Bed</i> • PV1.03.04 is labeled as <i>Location</i>
IN1.03 (<i>Insurance Company ID</i>)	0	0	This is supported for clearinghouse code use only. The Quest assigned clearinghouse code is provided in IN1.35 (<i>Company Plan Code</i>). This appears in the <i>Primary Carrier</i> section on the requisition. If IN1.03 is submitted in an additional IN1 segment, its value appears in the <i>Secondary Carrier</i> section on the requisition.
IN1.04 (<i>Insurance Company Name</i>)	C	0	This appears in the <i>Insurance Plan Name</i> field on the requisition. If IN1.04 is submitted in an additional IN1 segment, its value appears in the group of secondary insurance fields below the primary insurance plan name and address. For ABN requests, if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>), submit both IN1.04 and IN1.05. If you are using clearinghouse codes, also submit IN1.03 and IN1.35.
IN1.05 (<i>Insurance Company Address</i>)	C	0	This appears in the <i>Insurance Address</i> field on the requisition. If IN1.05 is submitted in an additional IN1 segment, its value appears in the group of secondary insurance fields below the primary insurance plan name and address.


HL7 ORM field	ABN	AOE/REQ	Comments
			For ABN requests, if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>), submit both IN1.04 and IN1.05. If you are using clearinghouse codes, also submit IN1.03 and IN1.35.
IN1.08 (<i>Group Number</i>)	0	0	<p>This appears in the <i>Group #</i> field on the requisition. If IN1.08 is submitted in an additional IN1 segment, its value appears in the group of secondary insurance fields below the primary insurance plan name and address.</p> <p>This is required for printing on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>).</p>
IN1.17 (<i>Insured's Relationship To Patient</i>)	0	0	<p>This appears in the <i>Relation</i> field on the requisition.</p> <p>This is required for printing on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>).</p>
IN1.36 (<i>Policy Number</i>)	0	0	<p>This appears in the <i>Insurance #</i> field on the requisition. If IN1.36 is submitted in an additional IN1 segment, its value appears in the group of secondary insurance fields below the primary insurance plan name and address.</p> <p>This is required for printing on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>).</p>
IN1.47 (<i>Bill Type</i>)	0	0	<p>This appears in the <i>Bill Type</i> field on the requisition.</p> <p>For ABN requests, if the value for this field is T (<i>Third-party bill</i>), 1 or more of the following fields must be populated:</p> <ul style="list-style-type: none"> • For clearinghouse codes only: IN1.03 (<i>Insurance Company ID</i>) • IN1.04 (<i>Insurance Company Name</i>) • IN1.05 (<i>Insurance Company Address</i>)
GT1.03 (<i>Guarantor Name</i>)	0	0	<p>This appears in the <i>Responsible Party</i> section on the requisition. Only the <i>Last Name</i> (GT1.03.01), <i>First Name</i> (GT1.03.02), and <i>Middle Initial</i> (GT1.03.03) appear on the requisition.</p> <p>This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>).</p>
GT1.05 (<i>Guarantor Address</i>)	0	0	<p>This appears in the <i>Responsible Party</i> section on the requisition.</p> <p>This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>).</p>

HL7 ORM field	ABN	AOE/REQ	Comments
GT1.06 (<i>Guarantor Ph Num-Home</i>)	0	0	This appears in the <i>Phone</i> field on the requisition. This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>).
GT1.08 (<i>Guarantor Date/Time Of Birth</i>)	0	0	This appears in the <i>DOB</i> field on the requisition. This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>).
GT1.09 (<i>Guarantor Sex</i>)	0	0	This appears in the <i>Sex</i> field on the requisition. This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>).
GT1.12 (<i>Guarantor SSN</i>)	0	0	This appears in the <i>SSN</i> field on the requisition. This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>).
ORC.02 (<i>Placer Order Number</i>)	0	R	ORC.02.01 appears in the <i>Lab Reference ID</i> field on the requisition.
ORC.12 (<i>Ordering Provider</i>)	0	0	This appears in the <i>NPI</i> and <i>Ref Physician Provider ID</i> fields on the requisition. Supply the NPI as follows: <i>NPI#^LastName^FirstName^Middle^^^^NPI</i>
OBR.02 (<i>Placer Order Number</i>)	0	R	This must match the value for ORC.02 (<i>Placer Order Number</i>).
OBR.04 (<i>Universal Service ID</i>)	R	R	This appears in the <i>Profiles/Tests</i> section on the requisition.
OBR.07 (<i>Observation Date/Time</i>)	0	0	This appears in the <i>Collection Date</i> and <i>Time</i> fields on the requisition.
OBR.16 (<i>Ordering Provider</i>)	0	0	This must match the value for ORC.12 (<i>Ordering Provider</i>).
DG1.03 (<i>Diagnosis Code</i>)	R	0	This appears in the <i>ICD Diagnosis Code(s)</i> field on the requisition.
OBX.03 (<i>Observation Identifier</i>)	0	0	Each AOE result is associated with the corresponding result code from either OBX.03.04 or OBX.03.01.

HL7 ORM field	ABN	AOE/REQ	Comments
OBX.05 (<i>Observation Value</i>)	0	0	This appears below OBR.04 (<i>Universal Service ID</i>) on the requisition.
NTE.03 (<i>Comment</i>)	0	0	<p>The comments appear below the diagnosis code in sections labeled <i>Reporting Comments</i> and <i>Internal Comments</i>.</p> <p>This is printed on the requisition if NTE.02 (<i>Source of Comment</i>) = I (internal comments) or R (report comments). The maximum length that is printed is 97 characters.</p>

Requisition form with field mapping

The requisition form below shows where the values from order fields appear on requisitions generated via the JAX-RS web service. The sample below is for a basic order with only 1 PV1.03 subfield and no AOE.

MSH.04 - ORC 02.01		Page # 1 of 1	
		Quest Diagnostics Incorporated EREQ _{WS}	
Client #: MSH.04 Client Name: Client Street Address: Client City, State, ZIP: Client Phone Number:		For Lab Use	
		Patient Information	
		PID 05.01, PID 05.02, PID 05.03 PID 11.01 PID 11.03, PID 11.04, PID 11.05 PID 13	
Collection Date: OBR.07 Time: OBR.07 Lab Reference ID: ORC.02.01	Pat ID #: PID.02 SSN: PID.19 DOB: PID.07 Sex: PID.08 Room: PV1.03.02		
Ref Physician Provider ID: ORC12.02, ORC12.03 Credentials: NPI: ORC.12.01	Responsible Party: Bill Type: IN1.47 GT1 3.01, GT1 3.02, GT1 3.03 Phone: GT1.06 GT1.05 Primary Carrier: IN1.03 Insurance #: IN1.36 SSN: GT1.12 Group #: IN1.08 Relation: IN1.17 DOB: GT1.08 Sex: GT1.09		
ICD-10 Diagnosis Code(s): DG1.03			
Reporting Comments: NTE.03			
Internal Comments: NTE.03			
Insurance Plan Name: IN1.04 Insurance Address: IN1.05			
Secondary Carrier: IN1.03 Insurance #: IN1.36 Group #: IN1.08 Insurance Plan Name: IN1.04 Insurance Address: IN1.05			
Profiles/Tests			
OBR.04 OBX.05			
<u>Signature Line</u>		<u>Date</u>	
<hr/>		11/07/2023	
<small>Ordering provider signature, credentials and date (required by certain payers).</small>			
End of Requisition			

Sample order requests and responses

This section provides sample request and response messages for the JAX-RS web service.

submitOrder request and response

The following are sample `submitOrder` request and response messages. For details on the `submitOrder` method, see “[JAX-RS \(RESTful\) web service methods](#)” on page 40.

submitOrder request (shown decoded from Base64)

```
MSH|^~\&||ORDR_251_PVDR_ACCT||ORDR_251_
PVDR|20241206021810||OML^O21|123456789AaBbCcDdEe|D| 2.5.1
PID||123456789|123456789||Lastname^Firstname||19651109|M
PV1||A
ORC|NW|987654321
OBR|1|987654321||^10124^CARDIO CRP||20241206021810
```

submitOrder response (shown decoded from Base64)

```
MSH|^~\&||ORDR_251_PVDR||ORDR_251_PVDR_
ACCT|20240428074459||ORL^O22|123456789AaBbCcDdEe|D|
2.5.1
MSA|AA|123456789AaBbCcDdEe|a9de74f6ac1262891c749e075ac4751f
```

getOrderDocument request and responses

The following are sample `getOrderDocument` request and response messages. Both the request and the response include the JSON-formatted message body, as well as the decoded Base64 HL7 message. For details on the `getOrderDocument` method, see “[JAX-RS \(RESTful\) web service methods](#)” on page 40.

Note: Only a single request sample is shown since the format is identical for all request types. The sample responses, however, illustrate a separate response for each request type. When multiple request types are submitted simultaneously, the responses are combined into a single response, which may contain 1 or more `orderSupportDocuments` attributes.

getOrderDocument request

```
{
  "documentTypes": [
    "ABN", "REQ", "AOE"
  ]
  "orderHl7": "TVNIffF5+XCZ8Q1RGV3w5NzUwMjg0MHx8TkVMfDIwM...",
  > (Base64-encoded content truncated)
}
```

Decoded orderHL7:

```
MSH|^~\&|CTFW|97502840||NEL|20240404124322||ORM^O01|ABNREQ24208420|T|2.3
PID|1|MRN006|8558^^^QDPNUM|608|Lastname^Firstname^Y||19850517|F|||123 POC
ST^^CINCINNATI^OH^
  45251||^555^6326321|||97502840|201201201
NTE|1|R|Comment Comment Comment
IN1|1||MCRCT|||Lastname^Firstname^Y|1|19850517|
|||||T
>GT1|1||Lastname^Firstname^Y||123 POC
ST^^CINCINNATI^OH^45251|^555^6326321||19850517|F|||
  201201201
ORC|NW|354||4B6B6cd|||A1234567890^CHAPLIN^DAVID^^^^^NPI
OBR|1|354||^10124^CARDIO CRP|||20240505|||A1234567890^CHAPLIN^DAVID^^^^^NPI

DG1|1|ICD|V7260
```

Sample responses are provided for the following:

- “[getOrderDocument response—requisition generated and ABN not required](#)” below
- “[getOrderDocument response—AOE not required](#)” on the next page
- “[getOrderDocument response—AOE required \(first response, with URL\)](#)” on the next page
- “[getOrderDocument response—AOE required \(second response, with order\)](#)” on page 58

getOrderDocument response—requisition generated and ABN not required

```
{
  "ackhl7": "TVNIffF5+XCZ8fE5FTHxDVEZXfDk3NTAyODQwfDIwMTQ...", Base64-
encoded content truncated
  "orderSupportDocuments": [ {
    "documentData": "",
    "documentType": "ABN-REQ",>
    "requestStatus": "0000: Processing Completed Successfully",
    "responseMessage": "REQ OK; ABN is not required",
    "status": "true",
    "misc": null,
    "cdaRepresentation": null
  } ]
}
```

Decoded ackHL7:

```
MSH|^~\&||NEL|CTFW|97502840|20240429084925||OOR^O02|ABNREQ24208420|T|2.3
MSA|AA|ABNREQ24208420|af3fc718ac1262891cbbe59faec0fec0|||^0000: Processing Completed
  Successfully
```

getOrderDocument response—AOE not required

```
{
  "ackhl7": "TVNIffF5+XCZ8fE5FTHxDVEZXfDk3NTAyODQwfDIwMTQ...",
  (Base64-encoded content truncated)
  "orderSupportDocuments": [ {
    "documentData": "",
    "documentType": "AOE",
    "requestStatus": "0000: Processing Completed Successfully",
    "responseMessage": "",
    "status": "true",
    "misc": null,
    "cdaRepresentation": null
  } ]
}
```

getOrderDocument response—AOE required (first response, with URL)

```
{
  "ackhl7": "TVNIffF5+XCZ8fE5FTHxDVEZXfDk5OTk5MDU2fDIwMTQ...",
  (Base64-encoded content truncated)
  "orderSupportDocuments": [ {
    "documentData": null,
    "documentType": "AOE",
    "requestStatus": "0000: Request processed",
    "responseMessage": "Ordercodes requiring an answer = 599; 10809; AOE URL =
      https://quanumqa.qdx.com/ssl/quanum.wls?MGWAPP=ewdwl&app=QA-
      FUSION&page=aoepsa&AOEToken=kVJcglHbbPMjDTOUzf5Pauq7KgS4ZmBs5f3m8AadsE1JW2Np-
f40M
      xbymE0k199xk9Qxk9IkIxxk6w9I",
    "success": true,
    "misc": null,
    "cdaRepresentation": null
  }, {
    "documentData": "YUhSMGNITZMeTlqWVhKbE16WXdjV0V1Y1...",
    (Base64-encoded content truncated)
    "documentType" : "AOEURL",
    "requestStatus" : "0000: Processing Completed Successfully",
    "responseMessage" : null,
    "success" : true,
    "misc" : null,
    "cdaRepresentation" : null
  } ]
}
```

getOrderDocument response—AOE required (second response, with order)

```
{
  "ackhl7": "TVNIffF5+XCZ8fE5FTHxDVEZXfDk5OTk5MDU2fDIwMTQ...",
  (Base64-encoded content truncated)
  "orderSupportDocuments": [ {
    "documentData": null,
    "documentType": "AOE",
    "requestStatus": "0000: Request processed",
    "responseMessage": null,
    "success": true,
    "misc": null,
    "cdaRepresentation": null
  }, {
    "documentData": "YUhSMGNITTZMeTlqWVhKbE16WXdjV0V1Y1...",
    (Base64-encoded content truncated)
    "documentType": "AOEORDER",
    "requestStatus": "0000: Processing Completed Successfully",
    "responseMessage": null,
    "success": true,
    "misc": null,
    "cdaRepresentation": null
  } ]
}
```

Acknowledgment of submitted orders

The Quantum Hub returns an acknowledgment (ACK) or negative acknowledgment (NAK) message for each order submission (including ABN, requisition, and AOE requests) to acknowledge receipt of the order and/or document request. Orders with an ABN, requisition, and/or AOE request return 1 of the following:

- **For an order with a successful ABN, REQ, and/or AOE request:** an HL7 ACK message is returned
- **For an order with a failed ABN, REQ, and/or AOE request:** an HL7 NAK message is returned

This section provides details on the ACK (or NAK) message that is returned by the Quantum Hub, and applies to all order message formats (HL7 2.3, 2.3.1, and 2.5.1) supported by the Quantum Hub.

Note: In the context of this chapter, a negative acknowledgment (NAK) message is an ACK message that contains an error condition, for example, *Application Error* (AE).

HL7 ACK message segment specifications

This section provides specifications for each segment of an HL7 ACK message that is returned by the Quantum Hub. Message segments include the following:

- [“MSH—Message header” on the next page](#)
- [“MSA—Message acknowledgment” on page 63](#)

Notes:

- In the following tables, the value 2.3.x indicates both HL7 2.3 and 2.3.1
- The HL7 2.3, 2.3.1, and 2.5.1 ACK message specifications include additional segments (in addition to MSH and MSA), but the Quantum Hub populates only these 2 segments; all other message segments can be ignored

Field specifications

The following table describes the parameters used to define the data fields within each message segment.

Parameter	Description
Required	<p>The fields within each segment are classified based on their requirement status of Required (R), Optional (O), Conditional (C), or Not Supported (X) as defined below:</p> <ul style="list-style-type: none">• Required. If the corresponding segment is present, the field must also be present within the segment, and the Quantum Hub validates it against any stated requirements. If the field is not present, the message is rejected by the Quantum Hub• Optional. The field is not required; the segment is accepted by the Quantum Hub whether or not this field is present. If the field is present, the Quantum Hub validates it against any stated requirements (The contents of this field will not be reflected in the lab result)• Conditional. The field may or may not be required, depending on certain conditions (stipulated in the <i>Comments</i> column of each segment table). If the stated conditions are not met, the message is rejected by the Quantum Hub. If the field is present, the Quantum Hub validates it against any stated requirements (The contents of this field may or may not be reflected in the lab result)• Not Supported. If a field is described as <i>Not Supported</i> (the corresponding fields appear in <i>gray text</i> in the table), the content of the field is not used by the lab
Type	An HL7 standard data type.
Length	The maximum allowed length for the field.
Repeat	<p>Each field is classified with 1 of the following values:</p> <ul style="list-style-type: none">• N: May not repeat• Y: May repeat any number of times• Y/n: May repeat up to <i>n</i> times

MSH—Message header

The Message Header (MSH) segment defines the intent, source, destination, and some specifics of the syntax of an HL7 message.

Field	Name	Req'd ^a	Type	Length	Repeat ^b	Comments
MSH.00	Segment Type Identifier	R	ST	4	N	This is MSH.
MSH.01	Field Separator	R	ST	1	N	This is a vertical bar ().
MSH.02	Encoding Characters	R	ST	4	N	The following characters may be used:

^aR = Required, O = Optional, X = Not Supported.

^bY = Field can repeat unlimited number of times, N = No repetition.

Field	Name	Req'd ^a	Type	Length	Repeat ^b	Comments
						<ul style="list-style-type: none"> • ^ (component separator) • ~ (repetition separator) • \ (escape character) • & (sub-component separator)
MSH.03	Sending Application	O	HD	227 (2.5.1) 180 (2.3.x)	N	This contains the value of MSH.05 from the order message.
MSH.04	Sending Facility	R	HD	227 (2.5.1) 180 (2.3.x)	N	This contains the value of MSH.06 from the order message.
MSH.05	Receiving Application	O	HD	227 (2.5.1) 180 (2.3.x)	N	This contains the value of MSH.03 from the order message.
MSH.06	Receiving Facility	R	HD	227 (2.5.1) 180 (2.3.x)	N	This contains the value of MSH.04 from the order message.
MSH.07	Date/Time of Message	R	TS	26	N	The current date and time, formatted as YYYYMMDDHHMMSS. Note: All date timestamps are set to Coordinated Universal Time (UTC).
MSH.08	Security	X				
MSH.09	Message Type	R	MSG (2.5.1) CM (2.3.x)	15	N	For HL7 2.5.1 (type = MSG), this contains ORL^O22. For HL7 2.3.x (type = CM), this contains OOR^O02.
MSH.10	Message Control ID	R	ST	20	N	This contains the value of MSH.10 from the order message.
MSH.11	Processing ID	R	PT	3	N	This contains 1 of the following values, depending on the environment:

^aR = Required, O = Optional, X = Not Supported.

^bY = Field can repeat unlimited number of times, N = No repetition.

Field	Name	Req'd ^a	Type	Length	Repeat ^b	Comments
						<ul style="list-style-type: none"> • P = Production • T = Training • D = Debug (Development)
MSH.12	Version ID	R	VID	60	N	This contains the value of MSH.12 from the order message (2.3, 2.3.1, or 2.5.1).
MSH.13	Sequence Number	X				
MSH.14	Continuation Pointer	X				
MSH.15	Accept Acknowledgment Type	X				
MSH.16	Application Acknowledgment Type	X				
MSH.17	Country Code	X				
MSH.18	Character Set	X				
MSH.19	Principal Language of Message	X				
MSH.20	Alternate Character Set Handling Scheme	X				
MSH.21	Message Profile Identifier	X				

^aR = Required, O = Optional, X = Not Supported.

^bY = Field can repeat unlimited number of times, N = No repetition.

MSA—Message acknowledgment

The Message Acknowledgment (MSA) segment defines the acknowledgment (ACK) message that is returned for an order.

Field	Name	Req'd ^a	Type	Length	Repeat ^b	Comments
MSA.00	Segment Type Identifier	R	ST	4	N	This is MSA.
MSA.01	Acknowledgment Code	R	ID	2	N	This indicates the status of the most recently received message. Valid acknowledgment codes are shown in “Acknowledgment codes” on the next page.
MSA.02	Message Control ID	R	ST	20	N	This contains the value of MSH.10 from the order message.
MSA.03	Text Message	O	ST	80	N	The Quantum Hub transaction ID for the order.
MSA.04	Expected Sequence Number	O	ST (2.5.1) NM (2.3.x)	15	N	This is blank.
MSA.05	Delayed acknowledgment Type	X O	(2.5.1) ID (2.3.x)	(2.5.1) 1 (2.3.x)	N	This is blank.
MSA.06	Error Condition	O	CE	250	N	For a SUCCESS status, this is blank. For an ERROR status (<i>Acknowledgment Code</i> = AE), MSA.06.01 (<i>Code</i>) is blank, and MSA.06.02 (<i>Description</i>) contains the error description.

^aR = Required, O = Optional, X = Not Supported.

^bY = Field can repeat unlimited number of times, N = No repetition.

Acknowledgment codes

The HL7 acknowledgment codes that are returned in the MSA segment are described below.

- To acknowledge the successful receipt and processing of an order (where `status = SUCCESS`), the following code is returned:
AA Enhanced mode: Application Acknowledgment: Accept
- To acknowledge an order that was **not** successfully received and processed (where `status = ERROR`), the following code is returned:
AE Enhanced mode: Application Acknowledgment: Error

Sample HL7 ACK messages

The following is an example of an ACK message:

```
MSH|^~\&||Provider Name|HUBWS|Provider  
Account|20240115031620||OOR^O02|bso004|D|2.5.1  
MSA|AA|bso004|a9de74f6ac1262891c749e075ac4751f|
```

The following is an example of a NAK message:

```
MSH|^~\&||Provider Name|HUBWS|Provider  
Account|20240115041423||ORL^O22|bso005|D|2.5.1  
MSA|AE|bso005|a994b9cfac1262891c749e0772a85dd9|||^Order message version '2.5.1' does  
not match the resolved Quanum Hub Account order version '2.3'
```

JAX-RS web service endpoints

Your client application can access the JAX-RS web service via the endpoints provided in this section. There is a unique endpoint for each method, as well as for each of the following Quantum Hub environments:

- **Certification.** Use this environment for developing, testing, and certifying your client application. For the Certification environment endpoints, see “[Certification environment](#)” below
- **Production.** Use this environment after your client application has been certified. For the Production environment endpoints, see “[Production environment](#)” below

Note: You must have valid credentials from Quest to access each endpoint. For the Production environment, credentials are issued once your client application has been developed, tested, and certified.

Certification environment

To access the JAX-RS web service in the certification environment, access the following links:

submitOrder endpoint

<https://certhubservices.quantum.com/hub-resource-server/oauth2/order/submission>

getOrderDocument endpoint

<https://certhubservices.quantum.com/hub-resource-server/oauth2/order/document>

Production environment

Once you have developed, tested, and certified your client application in the certification environment, you can then update the application to work in the production environment. Connecting a client application to the Production environment is similar to connecting to the certification environment (the exposed interfaces are equivalent).

Note: Client applications developed against the certification environment can also be used to access the production environment, and vice versa; the web service is identical in both environments.

To access the JAX-RS web service in the Production environment, access the following links:

submitOrder endpoint

<https://hubservices.quantum.com/hub-resource-server/oauth2/order/submission>

getOrderDocument endpoint

<https://hubservices.quantum.com/hub-resource-server/oauth2/order/document>

Chapter 5: JAX-WS (SOAP) Order Submission web service

In this chapter:

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- Best practices for using the JAX-WS Order Submission web service 68
- JAX-WS Order Submission web service API 69
- HL7 fields for getOrderDocuments requests 78
- JAX-WS Order Submission web service WSDL 84
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- Sample order requests and responses 89
- Acknowledgment of submitted orders 95
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About the JAX-WS (SOAP-Based) Order Submission web service

This chapter provides details about the JAX-WS Order Submission API. JAX-WS uses a SOAP-based web service protocol. It facilitates the submitting of lab orders to a Quest Diagnostics lab for processing, as well as receiving order acknowledgments.

JAX-WS supports the following request types, submitted either separately, or in any combination:

- **ABN.** Submitting a lab order for Advance Beneficiary Notice (ABN) evaluation, prior to submitting the order to the lab for processing. If an ABN is required, 2 copies of the ABN are returned
- **AOE.** Submitting a lab order for an Ask at Order Entry (AOE) question evaluation, prior to submitting the order to the lab for processing. If 1 or more order codes require AOE questions to be answered, a URL is returned allowing the user to do so prior to resubmitting the order; otherwise, the order is automatically sent to the lab
- **REQ.** Submitting a lab order for a requisition (REQ) request. If the corresponding requisition generates without error, the requisition is returned, and the order is automatically sent to the lab (unless submitted in combination with an AOE request that requires AOE questions to be answered)

For details on the potential response(s) from each request type when submitted separately, or in any combination, see [“Potential responses for getOrderDocuments requests” on page 70.](#)

To access this web service using OAuth 2.0 authentication, a valid OAuth2 token is required. (See [“OAuth 2.0 for JAX-RS \(RESTful\) and JAX-WS \(SOAP\) web services” on page 32.](#))

For more information

- For details about the Order Submission web service, see [“JAX-WS Order Submission web service API” on page 69](#)
- For information about the acknowledgment of submitted orders, see [“Acknowledgment of submitted orders” on page 95](#)
- For information about accessing the WSDL, see [“About the WSDL interface document” on page 100](#)
- For HL7 order message specifications, see [Chapter 6, “Order HL7 2.3 specification” beginning on page 101](#), [Chapter 7, “Order HL7 2.3.1 specification” beginning on page 156](#), or [Chapter 8, “Order HL7 2.5.1 specification” beginning on page 211](#)

Best practices for using the JAX-WS Order Submission web service

This section describes the best practices that you should follow when creating a client application to interact with the JAX-WS (SOAP) Order Submission web service. Following these best practices will help minimize any technical or performance issues that might otherwise result from invalid or inappropriate use of the web service.

- **Submit individual orders only.** You must submit HL7 orders to the Order Submission web service 1 at a time. Multiple HL7 messages can be sent for multiple patients; however, they must be submitted 1 at a time. The client application does not need to disconnect from the web service, but each order must be sent individually using the [submitOrder](#) method. Your client application should reuse the same connection when making concurrent calls, to avoid impacting system performance
- **Do not submit a duplicate order.** Do not submit the same order message to the Quantum Hub more than once; duplicate orders are ignored by the Quantum Hub, but may impact system performance. An order number must be unique per Quest account
- **Do not resubmit an invalid order.** If you submit an order message to the Quantum Hub that returned a negative acknowledgment (NAK) message indicating the content of the message was invalid—that is, it contains an AE acknowledgment code—do not resubmit the same message without first analyzing and correcting the data error

Note: For more information about acknowledgment (ACK) and negative acknowledgment (NAK) messages that are returned by the Quantum Hub, see [“Acknowledgment of submitted orders” on page 95](#).

JAX-WS Order Submission web service API

This section provides details on the methods and objects provided by the Order Submission web service API.

Order methods

The following is a brief overview of each method provided by the JAX-WS Order Submission web service. All methods require that the order message be in HL7 format. When using the `getOrderDocuments` method, the order may or may not be submitted on the initial request, based on the response.

- **submitOrder.** Submits a new lab order, including both basic lab orders and Patient Service Center (PSC) Hold orders
- **getOrderDocuments.** Requests order documents and/or AOE questions for the accompanying order, as follows:
 - **ABN.** Determines whether or not an ABN is required. If an ABN **is** required, 2 copies of the ABN are returned in a PDF file. The order is **not** forwarded on for processing, regardless of whether or not an ABN is required. For an explanation of ABNs, see [“ABN forms” on page 27](#) and for a sample ABN, see [“ABN form example” on page 28](#)
 - **AOE.** Determines whether or not AOE questions are required for the submitted order codes. If AOE questions **are** required, a URL is returned (that can be presented to the client application user to answer the associated AOE questions), and the order is **not** forwarded on for processing. After the user answers the AOE questions, the client application resubmits the order, which the Quantum Hub combines with the associated questions and answers before submitting to the lab for processing
 - **REQ.** Creates a requisition for the accompanying order, returns the requisition in a PDF file, and forwards the order to the lab for processing (unless submitted in combination with an AOE request that requires AOE questions to be answered). For a sample requisition, see [“Requisition form with field mapping” on page 83](#)

For details on the potential response(s) from each request type when submitted separately, or in any combination, see [“Potential responses for getOrderDocuments requests” on the next page](#).

Usage details for the order methods are provided in [“Order method details” on the next page](#).

Order method details

The following table provides details about each of the methods listed previously.

Method	Description
submitOrder	<p>Summary:</p> <p>This method submits a new lab order and supports both basic lab orders and PSC Hold orders.</p> <p>Usage:</p> <p>The Order object contains the inbound lab order message.</p> <ul style="list-style-type: none">• Even though an inbound lab order message may be accepted by the Quantum Hub, it still may ultimately be rejected by the provider• For HL7 order message specifications, see Chapter 6, “Order HL7 2.3 specification” beginning on page 101, Chapter 7, “Order HL7 2.3.1 specification” beginning on page 156, or Chapter 8, “Order HL7 2.5.1 specification” beginning on page 211 <p>Method Signature:</p> <p><code>orderResponse submitOrder(Order order)</code> throws <code>SOAPException</code></p>
getOrderDocuments	<p>Summary:</p> <p>This method evaluates a lab order for 1 or more order document request types—including ABN, requisition, and/or AOE questions—and returns the corresponding document(s) and/or URL. Request types can be submitted separately, or in any combination.</p> <p>For details on the potential response(s) from each request type when submitted separately, or in any combination, see “Potential responses for getOrderDocuments requests” below.</p> <p>Usage:</p> <p>The OrderSupportServiceRequest object contains the request type, as well as the inbound order message. The order message must be a valid HL7 message that contains the minimum required information for the request. The required fields are listed in “HL7 fields for getOrderDocuments requests” on page 78.</p> <ul style="list-style-type: none">• For HL7 order message specifications, see Chapter 6, “Order HL7 2.3 specification” beginning on page 101, Chapter 7, “Order HL7 2.3.1 specification” beginning on page 156, or Chapter 8, “Order HL7 2.5.1 specification” beginning on page 211 <p>Method Signature:</p> <p><code>OrderSupportServiceResponse getOrderDocuments(OrderSupportServiceRequest request)</code> throws <code>SOAPException</code></p>

Potential responses for getOrderDocuments requests

The following table describes the potential response(s) from each [getOrderDocuments](#) request type when submitted separately, or in any combination.

Request Type(s)	Response(s)	Order submitted?	Included in response
ABN only	ABN not required	No	No PDF file is returned.
	ABN required	No	Two copies of the ABN are returned in a PDF file.
REQ only	REQ created	Yes	The requisition is returned in a PDF file.
AOE only	AOE not required, or already answered	Yes	The original order HL7 is returned, including AOE questions and answers (if required). No URL is returned.
	AOE required	No	A URL is returned; the user must answer AOE questions and then resubmit the order.
ABN-REQ	ABN not required REQ created	Yes	The requisition is returned in a PDF file.
	ABN required REQ created	Yes	Two copies of the ABN and 1 copy of the requisition are returned in a single PDF file.
ABN-AOE	ABN not required AOE not required, or already answered	Yes	The original order HL7 is returned, including AOE questions and answers (if required). No URL or PDF file is returned.
	ABN not required AOE required	No	A URL is returned; the user must answer AOE questions and then resubmit the order. No PDF file is returned.
	ABN required AOE not required, or already answered	Yes	Two copies of the ABN, as well as AOE questions and answers (if required), are returned in a PDF file. The original order HL7 is returned, including AOE questions and answers (if required). No URL is returned.
	ABN required AOE required	No	Two copies of the ABN are returned in a PDF file. A URL is returned; the user must answer AOE questions and then resubmit the order.
AOE-REQ	REQ created AOE not required, or already answered	Yes	The requisition, including AOE questions and answers (if required), is returned in a PDF file. The original order HL7 is returned, including AOE questions and answers (if required). No URL is returned.

Request Type(s)	Response(s)	Order submitted?	Included in response
	REQ created AOE required	No	The requisition is returned in a PDF file. A URL is returned; the user must answer AOE questions and then resubmit the order.
ABN-AOE-REQ	ABN not required REQ created AOE not required, or already answered	Yes	The requisition, including AOE questions and answers (if required), is returned in a PDF file. The original order HL7 is returned, including AOE questions and answers (if required). No URL is returned.
	ABN not required REQ created AOE required	No	The requisition is returned in a PDF file. A URL is returned; the user must answer AOE questions and then resubmit the order.
	ABN required REQ created AOE not required, or already answered	Yes	Two copies of the ABN and 1 copy of the requisition, including AOE questions and answers (if required), are returned in a single PDF file. The original order HL7 is returned, including AOE questions and answers (if required). No URL is returned.
	ABN required REQ created AOE required	No	Two copies of the ABN and 1 copy of the requisition are returned in a single PDF file. A URL is returned; the user must answer AOE questions and then resubmit the order.
Any type or combination	Error message	No	No PDF file, order HL7, or URL is returned.

Order objects

The Order Submission web service API provides the following objects:

- [“BaseQuantum HubServiceResponse” on the next page](#)
- [“Order” on page 74](#)
- [“orderResponse” on page 74](#)
- [“OrderSupportServiceRequest” on page 74](#)
- [“OrderSupportServiceResponse” on page 75](#)
- [“OrderSupportDocument” on page 75](#)

BaseQuantum HubServiceResponse

This represents the base response elements for a service request. The following table describes possible responses:

Description/attributes	Data type	Required?
responseCode. The response code for the transaction response. Specific response codes include the following: <ul style="list-style-type: none">• 3000. Validation error• 3001. Invalid lab in field 6 of the MSH segment• 3002. Invalid sending account. Field 4 of the MSH has an invalid Quest account, or an account that has not been configured in the Quantum Hub• 3003. The Quantum Hub account does not have permission to submit the order, or the lab does not have permission to receive the order• 3004. A duplicate order number. The order number must be unique per Quest account	String	Required
responseMsg. The response message value for the transaction response. The following messages can be returned in response to getOrderDocuments : <ul style="list-style-type: none">• No orderSupportRequest element found in request. The orderSupportRequest element is missing from the XML• Missing order support service request type. The orderSupportRequest element is present in the XML but is empty• Invalid order support service request type. The orderSupportRequest element contains an unsupported request• Duplicate order support service request type: NNN. There are duplicate orderSupportRequest elements in the submitted XML• hl7Order element missing or empty in request. The requests for order documents must contain an HL7 order	String	Optional
responseProperties. The array of ResponseProperty objects specifying any detail properties for the transaction response.	ResponseProperty[]	Optional
status. The status of the transaction response. Valid values are SUCCESS or ERROR.	String	Required

Order

This object contains the inbound order message. The following table describes attributes that can be set for this object:

Note: For HL7 order message specifications, see [Chapter 6, “Order HL7 2.3 specification”](#) beginning on page 101, [Chapter 7, “Order HL7 2.3.1 specification”](#) beginning on page 156, or [Chapter 8, “Order HL7 2.5.1 specification”](#) beginning on page 211.

Description/attributes	Data type	Required?
hl7Order. The Base64-encoded HL7 order message.	base64Binary[]	Required

orderResponse

This object represents the base response elements for a lab order. This includes the message control ID, the Quantum Hub transaction ID, and any validation errors that occur. The following table describes possible responses:

Description/attributes	Data type	Required?
hl7OrderAck. The Base64-encoded HL7 ACK message. (For details on the ACK message returned, see “Acknowledgment of submitted orders” on page 95.)	base64Binary[]	Optional
messageControlId. The message control ID included in the order message that was submitted to the Quantum Hub.	String	Optional
orderTransactionUid. The Quantum Hub transaction ID for the response.	String	Optional
validationErrors. The array of validation errors returned, if the order message is returned based on validation.	String	Optional

Note: See the [BaseQuantum HubServiceResponse](#) object for additional attributes that can be set for this object.

OrderSupportServiceRequest

The top-level construct for the request that represents a [getOrderDocuments](#) request. This object encapsulates all data needed to evaluate the order for 1 or more request types. The following table describes attributes that can be set for this object:

Description/attributes	Data type	Required?
orderSupportRequests. One or more of the following request types: <ul style="list-style-type: none">• ABN• REQ• AOE	String[]	Required
hl7Order. The Base64-encoded HL7 order message.	String[]	Required

OrderSupportServiceResponse

This object represents the base response elements for a [getOrderDocuments](#) request. The following table describes possible responses:

Description/attributes	Data type	Required?
OrderResponse. See “ orderResponse ” on the previous page.	OrderResponse	Required
orderSupportDocuments. An array of all Order-SupportDocuments generated as a result of the request.	orderSupportDocuments[]	Optional

Note: See the [BaseQuantum HubServiceResponse](#) object for additional attributes that can be set for this object.

OrderSupportDocument

This object returns the order document information for a specific request type. The following table describes attributes that can be set for this object:

Note: Additional response elements are set via the [orderResponse](#) object (messageControlId and orderTransactionUid attributes) and the [BaseQuantum HubServiceResponse](#) object (responseMsg and status attributes).

Description/attributes	Data type	Required?
documentData. A Base64-encoded file containing one of the following, based on the documentType value shown: <ul style="list-style-type: none">• ABN. Two copies of an ABN• REQ. A requisition• AOEURL. The URL to access the AOE questions Note: This is applicable only for an initial AOE request, when AOE questions are required for the submitted order codes• AOEORDER. A copy of the complete order, including the AOE questions and answers Note: This is applicable only after the AOE questions are answered, either on the original order, or via the URL returned from the initial request	base64Binary[]	Optional
documentType. Indicates the type of response returned (ABN, REQ, AOE, AOEURL, or AOEORDER). ABN, REQ, and AOE may appear in any combination, separated by a hyphen. Note: See the documentData attribute above for a description of what is returned for each response type.	String	Required

Description/attributes	Data type	Required?
<p>requestStatus. This indicates the status of a getOrderDocuments request. See “Request Status Codes” below for specific request status codes.</p> <p>Note: This is not applicable for AOE.</p>	String	Optional
<p>responseMessage. This includes 1 or more of the following strings (if the getOrderDocuments request was successful):</p> <ul style="list-style-type: none"> • ABN is not required • ABN is required • REQ OK • Ordercodes requiring an answer: <i>nnnn; nnnn;...; AOE</i> URL = <i>http://address...</i> <p>When an ABN is required and/or a requisition is requested, a PDF file containing the corresponding document(s) is returned in the documentData response.</p> <p>When AOE questions are required, the response message includes the order codes requiring AOE questions and answers, and a URL for accessing the associated questions.</p> <p>If the getOrderDocuments request was not successful, responseMessage contains the error message from the Quantum Hub.</p>	String	Optional
<p>success. Indicates if the getOrderDocuments request was successful (TRUE) or not (FALSE).</p>	Boolean	Optional

Request Status Codes

The following table shows some of the status codes that can be returned via the [OrderSupportDocument](#) object/requestStatus attribute in response to a [getOrderDocuments](#) request.

Code	Description
0000: Processing Completed Successfully	The order request completed successfully.
1030: Invalid request data: Performing Site (<i>value</i>)	The value in MSH.06 (<i>Receiving Facility</i>) is incorrect. Make sure that the value is the three-letter ID of the facility that performs the test.
1030: Invalid request data: Diagnosis Code (<i>value</i>)	The value in DG1.03 is incorrect.
1030: Invalid request data: Order Code (<i>value</i>)	The value in OBR.04 is incorrect.
1040: Incomplete request data: Carrier	Values are missing for IN1.03 (<i>Insurance Company ID</i>), IN1.04 (<i>Insurance Company Name</i>) and/or IN1.05 (<i>Insurance Company Address</i>).

Code	Description
1040: Incomplete request data: Last Name	PID.05 (<i>Patient Name</i>) is missing a value in PID.05.01. Both first and last names are required in PID.05.
1050: Maximum number of ICD codes exceeded	The maximum number of ICD codes allowed per order is 12.
1070: Unable to contact IMDB	The <i>Insurance Map Database</i> (IMDB) is not available, so the request cannot be processed.

HL7 fields for getOrderDocuments requests

The following table shows the HL7 order message fields that are used for [getOrderDocuments](#) requests; it does not show all of the fields required for a complete and valid order. When referring to this table, note the following:

- Order messages submitted for ABN documents need only a subset of the fields required for a complete and valid order
- Order messages submitted for AOE and/or requisition requests may be forwarded to the lab for processing, so they must be complete and valid orders as defined in [Chapter 6, “Order HL7 2.3 specification” beginning on page 101](#), [Chapter 7, “Order HL7 2.3.1 specification” beginning on page 156](#), or [Chapter 8, “Order HL7 2.5.1 specification” beginning on page 211](#)

In the following table:

- **R** (Required) indicates that the field is required for the request to be processed
- **O** (Optional) indicates that the field is optional for the request to be processed
- **C** (Conditional) indicates that the field is conditional and is required under certain circumstances, as explained in the *Comments* column

For a visual display of the requisition with a mapping of the fields, see [“Requisition form with field mapping” on page 83](#).

HL7 ORM field	ABN	AOE/REQ	Comments
MSH.04 (<i>Sending Facility</i>)	R	R	This appears in the <i>Client #</i> field on the requisition.
MSH.05 (<i>Receiving Application</i>)	O	C	This determines whether the requisition is for a basic lab order or a PSC Hold order, as follows: <ul style="list-style-type: none"> • A blank value indicates a basic lab order, and the <i>EREQ</i> logo appears in the upper-right corner of the requisition • A value of PSC indicates a PSC Hold order, and the <i>PSC Hold</i> logo appears in the upper-right corner of the requisition
MSH.06 (<i>Receiving Facility</i>)	R	R	The value in MSH.06 does not appear on the requisition, but it is used to generate the performing site information that appears on the requisition.
MSH.12 (<i>Version ID</i>)	R	R	This is 1 of the following versions: 2.3, 2.3.1, or 2.5.1.
PID.02 (<i>Patient ID (External ID)</i>)	O	R	This appears in the <i>Pat ID #</i> field on the requisition. Note: If you are using Orders 2.3.1 or 2.5.1, PID.03 is also required.
PID.05 (<i>Patient Name</i>)	R	R	The last name (PID.05.01) and first name (PID.05.02) are required; the middle initial (PID.05.03) is optional. This appears in the <i>Patient Information</i> section on the requisition.

HL7 ORM field	ABN	AOE/REQ	Comments
PID.07 (<i>Date of Birth</i>)	0	0	This appears in the <i>DOB</i> field on the requisition below the <i>Pat ID #</i> . Note: If the date value is invalid, it will not be printed on the requisition.
PID.08 (<i>Sex</i>)	0	0	This appears in the <i>Sex</i> field on the requisition below the <i>Pat ID #</i> . Note: If the <i>Sex</i> value is invalid, it will not be printed on the requisition.
PID.11 (<i>Patient Address</i>)	0	0	This appears in the <i>Patient Information</i> section on the requisition.
PID.13 (<i>Phone Number - Home</i>)	0	0	This appears in the <i>Patient Information</i> section on the requisition.
PID.19 (<i>SSN Number - Patient</i>)	0	0	This appears in the <i>SSN</i> field on the requisition to the right of the <i>Pat ID #</i> .
PV1.03 (<i>Assigned Patient Location</i>)	0	0	This appears below the patient <i>DOB</i> on the requisition, as follows: <ul style="list-style-type: none"> • PV1.03.01 is labeled as <i>Ward</i> • PV1.03.02 is labeled as <i>Room</i> • PV1.03.03 is labeled as <i>Bed</i> • PV1.03.04 is labeled as <i>Location</i>
IN1.03 (<i>Insurance Company ID</i>)	0	0	Supported for clearinghouse code use only. (The Quest-assigned clearinghouse code is provided in IN1.35 (<i>Company Plan Code</i>)). This appears in the <i>Primary Carrier</i> field on the requisition. If IN1.03 is submitted in an additional IN1 segment, its value appears in the <i>Secondary Carrier</i> field on the requisition.
IN1.04 (<i>Insurance Company Name</i>)	C	0	For ABN requests, if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>), submit both IN1.04 and IN1.05. If using clearinghouse codes, also submit IN1.03 and IN1.35. This appears in the <i>Insurance Plan Name</i> field on the requisition. If IN1.04 is submitted in an additional IN1 segment, its value appears in the group of secondary insurance fields below the primary insurance plan name and address.
IN1.05 (<i>Insurance Company Address</i>)	C	0	For ABN requests, if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>), submit both IN1.04 and IN1.05. If you are using clearinghouse codes, also submit IN1.03 and IN1.35.



HL7 ORM field	ABN	AOE/REQ	Comments
			This appears in the <i>Insurance Address</i> field on the requisition. If IN1.05 is submitted in an additional IN1 segment, its value appears in the group of secondary insurance fields below the primary insurance plan name and address.
IN1.08 (<i>Group Number</i>)	0	0	This is required for printing on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>). This appears in the <i>Group #</i> field on the requisition. If IN1.08 is submitted in an additional IN1 segment, its value appears in the group of secondary insurance fields below the primary insurance plan name and address.
IN1.17 (<i>Insured's Relationship To Patient</i>)	0	0	This is required for printing on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>). This appears in the <i>Relation</i> field on the requisition.
IN1.36 (<i>Policy Number</i>)	0	0	This is required for printing on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>). This appears in the <i>Insurance #</i> field on the requisition. If IN1.36 is submitted in an additional IN1 segment, its value appears in the group of secondary insurance fields below the primary insurance plan name and address.
IN1.47 (<i>Bill Type</i>)	0	0	For ABN requests, if the value for this field is T (<i>Third-party bill</i>), 1 or more of the following fields must be populated: <ul style="list-style-type: none"> • For clearinghouse codes only: IN1.03 (<i>Insurance Company ID</i>) • IN1.04 (<i>Insurance Company Name</i>) • IN1.05 (<i>Insurance Company Address</i>) This appears in <i>Bill Type</i> on the requisition.
GT1.03 (<i>Guarantor Name</i>)	0	0	This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>). This appears in the <i>Responsible Party</i> section on the requisition. Only the last name (GT1.03.01), first name (GT1.03.02), and middle initial (GT1.03.03) appear on the requisition.
GT1.05 (<i>Guarantor Address</i>)	0	0	This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>). This appears in the <i>Responsible Party</i> section on the requisition.

HL7 ORM field	ABN	AOE/REQ	Comments
GT1.06 (<i>Guarantor Ph Num-Home</i>)	0	0	This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>). This appears in the <i>Phone</i> field on the requisition.
GT1.08 (<i>Guarantor Date/Time Of Birth</i>)	0	0	This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>). This appears in the <i>DOB</i> field on the requisition.
GT1.09 (<i>Guarantor Sex</i>)	0	0	This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>). This appears in the <i>Sex</i> field on the requisition.
GT1.12 (<i>Guarantor SSN</i>)	0	0	This is printed on the requisition only if IN1.47 (<i>Bill Type</i>) = T (<i>Third-party bill</i>) or P (<i>Patient bill</i>). This appears in the <i>SSN</i> field on the requisition.
ORC.02 (<i>Placer Order Number</i>)	0	R	ORC.02.01 appears in the <i>Lab Reference ID</i> field on the requisition.
ORC.12 (<i>Ordering Provider</i>)	0	R	This appears in the <i>NPI</i> and <i>Ref Physician Provider ID</i> fields on the requisition. Supply the NPI as follows: <i>NPI#^LastName^FirstName^Middle^^^^NPI</i>
OBR.02 (<i>Placer Order Number</i>)	0	R	This must be the same as ORC.02 (Placer Order Number) .
OBR.04 (<i>Universal Service ID</i>)	R	R	This appears in the <i>Profiles/Tests</i> section on the requisition.
OBR.07 (<i>Observation Date/Time</i>)	0	0	This appears in the <i>Collection Date</i> and <i>Time</i> fields on the requisition.
OBR.16 (<i>Ordering Provider</i>)	0	0	The value for OBR.16 must match the value for ORC.12 (Ordering Provider) .
DG1.03 (<i>Diagnosis Code</i>)	R	0	This appears in the <i>ICD Diagnosis Code(s)</i> fields on the requisition.
OBX.03 (<i>Observation Identifier</i>)	0	0	Each AOE result is associated with the corresponding result code from either OBX.03.04 or OBX.03.01.

HL7 ORM field	ABN	AOE/REQ	Comments
OBX.05 (<i>Observation Value</i>)	0	0	This appears below OBR.04 (Universal Service ID) on the requisition.
NTE.03 (<i>Comment</i>)	0	0	<p>NTE.03 comments are printed on the requisition if NTE.02 (<i>Source of Comment</i>) = I (<i>Internal comments</i>) or R (<i>Report comments</i>).</p> <p>The maximum length that is printed is 97 characters.</p> <p>The comments appear below the diagnosis code in the sections labeled <i>Reporting Comments</i> and <i>Internal Comments</i>.</p>

Requisition form with field mapping

The requisition form below shows where the values from order fields appear on requisitions generated via the Order Submission web service. The sample below is for a basic order with only 1 PV1.03 subfield and no AOE.

PERFORMING SITE LINE 1		For Lab Use		Patient Information	
PERFORMING SITE LINE 2				PID.05.01, PID.05.02 PID.05.03	
123 MAIN STREET				PID.11.01	
CITY, STATE ZIP				PID.11.03, PID.11.04 PID.11.05	
513-555-0123				PID.13	
Collection Date: OBR.07	Time: OBR.07	Pat ID #: PID.02	SSN: PID.19		
Lab Reference ID: ORC.02.01		DOB: PID.07	Sex: PID.08		
		Room: PV1.03.02			
Ref Physician Provider ID: ORC.12.02, ORC.12.03		Responsible Party: GT1.03.01, GT1.03.02 GT1.03.03	Bill Type: IN1.47	Phone: GT1.06	
NPI: ORC.12.01		GT1.05	Primary Carrier: IN1.03		
		Insurance #: IN1.36	SSN: GT1.12	Relation: IN1.17	
		Group #: IN1.08	DOB: GT1.08	Sex: GT1.09	
ICD Diagnosis Code(s): DG1.03					
Reporting Comments: NTE.03					
Internal Comments: NTE.03					
Insurance Plan Name: IN1.04					
Insurance Address: IN1.05					
Secondary Carrier: IN1.03					
Insurance #: IN1.36					
Group #: IN1.08					
Insurance Plan Name: IN1.04					
Insurance Address: IN1.05					
Profiles/Tests					
OBR.04					
OBX.05					
Barcode # 1			Barcode # 2		
					
End of Requisition					

JAX-WS Order Submission web service WSDL

In order to submit orders via the Order Submission web service, the messages that are sent to, or retrieved from, the Quantum Hub must conform to the following Web Services Definition Language (WSDL):

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<!-- Generated by JAX-WS RI (http://JAX-ws.java.net). RI's version is
JAX-WS RI 2.3.0-b170407.2038 svn-revision#2eaca54d17a59d265c6fe886b7fd0027836c766c.
-->
<definitions targetNamespace="http://QuantumSolutions.com/orders"
name="OrderSubmissionService"
xmlns="http://schemas.xmlsoap.org/wsdl/" xmlns:wsp="http://www.w3.org/ns/ws-policy"
xmlns:wsu="http://docs.oasis-open.org/wss/2004/01
/oasis-200401-wss-wssecurity-utility-1.0.xsd"
xmlns:wsp1_2="http://schemas.xmlsoap.org/ws/2004/09/policy"
xmlns:tns="http://QuantumSolutions.com/orders" xmlns:xsd-
d="http://www.w3.org/2001/XMLSchema"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:wsam=
"http://www.w3.org/2007/05/addressing/metadata">
  <types>
    <xsd:schema>
      <xsd:import namespace="http://QuantumSolutions.com/orders"
schemaLocation="OrderSubmissionService_schema1.xsd"/>
    </xsd:schema>
  </types>
  <message name="submitOrder">
    <part name="parameters" element="tns:submitOrder"/>
  </message>
  <message name="submitOrderResponse">
    <part name="parameters" element="tns:submitOrderResponse"/>
  </message>
  <message name="SOAPException">
    <part name="fault" element="tns:SOAPException"/>
  </message>
  <message name="getOrderDocuments">
    <part name="parameters" element="tns:getOrderDocuments"/>
  </message>
  <message name="getOrderDocumentsResponse">
    <part name="parameters" element="tns:getOrderDocumentsResponse"/>
  </message>
  <portType name="OrderSubmissionPortType">
    <operation name="submitOrder">
      <input wsam:Action="http://QuantumSolutions.com/orders/OrderSubmissionPortType
/submitOrderRequest" message="tns:submitOrder"/>
      <output wsam:Action="http://QuantumSolutions.com/orders/OrderSubmissionPortType
/submitOrderResponse" message="tns:submitOrderResponse"/>
      <fault message="tns:SOAPException" name="SOAPException" wsam:Action=
"http://QuantumSolu-
tions.com/orders/OrderSubmissionPortType/submitOrder/Fault/SOAPException"/>
    </operation>
  </portType>
</definitions>
```

```

    </operation>
    <operation name="getOrderDocuments">
        <input wsam:Action="http://QuantumSolutions.com/orders/OrderSubmissionPortType
/getOrderDocumentsRequest" message="tns:getOrderDocuments"/>
        <output wsam:Action="http://QuantumSolutions.com/orders/OrderSubmissionPortType
/getOrderDocumentsResponse" message="tns:getOrderDocumentsResponse"/>
        <fault message="tns:SOAPException" name="SOAPException" wsam:Action=
"http://QuantumSolutions.com/orders/OrderSubmissionPortType/getOrderDocuments/Fault
/SOAPException"/>
    </operation>
</portType>
<binding name="OrderSubmissionPortTypePortBinding" type=
e="tns:OrderSubmissionPortType">
    <soap:binding transport="http://schemas.xmlsoap.org/soap/http"
style="document"/>
    <operation name="submitOrder">
        <soap:operation soapAction=""/>
        <input>
            <soap:body use="literal"/>
        </input>
        <output>
            <soap:body use="literal"/>
        </output>
        <fault name="SOAPException">
            <soap:fault name="SOAPException" use="literal"/>
        </fault>
    </operation>
    <operation name="getOrderDocuments">
        <soap:operation soapAction=""/>
        <input>
            <soap:body use="literal"/>
        </input>
        <output>
            <soap:body use="literal"/>
        </output>
        <fault name="SOAPException">
            <soap:fault name="SOAPException" use="literal"/>
        </fault>
    </operation>
</binding>
<service name="OrderSubmissionService">
    <port name="OrderSubmissionPortTypePort" bind-
ing="tns:OrderSubmissionPortTypePortBinding">
        <soap:address location="https://hubvelocity.dev.medplus.com/hub-ws-resource-
server
/oauth2/orders/submission/service"/>
    </port>
</service>
</definitions>

```

Order Submission web service XML schema

The messages that are sent to, or retrieved from, the Quantum Hub to submit orders via the Order Submission web service must conform to the following XML schema:

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:ns0="http://QuantumSolutions.com/orders" xmlns:xsd=
"http://www.w3.org/2001/XMLSchema" targetNamespace="http://QuantumSolutions.com/orders">
  <xsd:complexType name="getOrderDocuments">
    <xsd:sequence>
      <xsd:element name="getOrderDocumentsRequest" type=
"ns0:orderSupportServiceRequest" form="qualified" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="getOrderDocumentsResponse">
    <xsd:sequence>
      <xsd:element name="Result" type="ns0:orderSupportServiceResponse" form=
"qualified" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="SOAPException">
    <xsd:sequence>
      <xsd:element name="message" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="submitOrder">
    <xsd:sequence>
      <xsd:element name="SubmitOrderRequest" type="ns0:orderRequest" form=
"qualified" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="submitOrderResponse">
    <xsd:sequence>
      <xsd:element name="Result" type="ns0:orderResponse" form="qualified"
minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="orderSupportServiceRequest">
    <xsd:complexContent>
      <xsd:extension base="ns0:orderRequest">
        <xsd:sequence>
          <xsd:element name="orderSupportRequests" type="xsd:string"
minOccurs="0" maxOccurs="unbounded" nillable="true"/>
        </xsd:sequence>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
```

```

<xsd:complexType name="orderRequest">
  <xsd:sequence>
    <xsd:element name="hl7Order" type="xsd:base64Binary" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="orderSupportServiceResponse">
  <xsd:complexContent>
    <xsd:extension base="ns0:orderResponse">
      <xsd:sequence>
        <xsd:element name="orderSupportDocuments" type="
e="ns0:orderSupportDocument"
minOccurs="0" maxOccurs="unbounded" nillable="true"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="orderResponse">
  <xsd:complexContent>
    <xsd:extension base="ns0:baseHubServiceResponse">
      <xsd:sequence>
        <xsd:element name="hl7OrderAck" type="xsd:base64Binary" minOc-
curs="0"/>
        <xsd:element name="messageControlId" type="xsd:string"
minOccurs="0"/>
        <xsd:element name="orderTransactionUid" type="xsd:string" minOc-
curs="0"/>
        <xsd:element name="validationErrors" type="xsd:string" minOccurs="0"
maxOccurs="unbounded" nillable="true"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="baseHubServiceResponse">
  <xsd:sequence>
    <xsd:element name="responseCode" type="xsd:string" minOccurs="0"/>
    <xsd:element name="responseMsg" type="xsd:string" minOccurs="0"/>
    <xsd:element name="responseProperties" type="ns0:responseProperty"
minOccurs="0" maxOccurs="unbounded" nillable="true"/>
    <xsd:element name="status" type="xsd:string" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="responseProperty">
  <xsd:sequence>
    <xsd:element name="propertyName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="propertyValue" type="xsd:string" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="orderSupportDocument">
  <xsd:sequence>

```

```
<xsd:element name="documentData" type="xsd:base64Binary" minOccurs="0"/>
<xsd:element name="documentType" type="xsd:string" minOccurs="0"/>
<xsd:element name="requestStatus" type="xsd:string" minOccurs="0"/>
<xsd:element name="responseMessage" type="xsd:string" minOccurs="0"/>
<xsd:element name="success" type="xsd:boolean"/>
</xsd:sequence>
</xsd:complexType>
<xsd:element name="getOrderDocuments" type="ns0:getOrderDocuments"/>
<xsd:element name="getOrderDocumentsResponse" type-
e="ns0:getOrderDocumentsResponse"/>
<xsd:element name="SOAPException" type="ns0:SOAPException"/>
<xsd:element name="submitOrder" type="ns0:submitOrder"/>
<xsd:element name="submitOrderResponse" type="ns0:submitOrderResponse"/>
</xsd:schema>
```

Sample order requests and responses

This section provides sample request and response messages for the Order Submission web service. Since the samples focus on the elements unique to the order submission and order document requests and responses, the sample messages for an order submission request and response are the only ones that show the SOAP envelope and/or header tags. The remaining samples show just the body tag and the request/response elements contained within.

Submit order request

The following is a sample order submission:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:ord="http://Quanum.com/orders">
  <soapenv:Header/>
  <soapenv:Body>
    <ord:submitOrder>
      <!--Optional:-->
      <ord:SubmitOrderRequest>
        <!--Optional:-->
        <hl7Order>TVN1fF5+XCZ8IHxzaG13YW5wYXx8c2hpd2FuchJv...
          Base64-encoded content truncated
        </hl7Order>
      </ord:SubmitOrderRequest>
    </ord:submitOrder>
  </soapenv:Body>
</soapenv:Envelope>
```

Submit order response

The following is a sample response from an order submission:

```
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:submitOrderResponse xmlns:ns2="http://Quanum.com/orders">
      <ns2:Result>
        <status>SUCCESS</status>
        <hl7OrderAck>TVN1fF5+XCZ8fEJyZW50IFByb3ZpZGVyfEhVQ...
          Base64-encoded content truncated
        </hl7OrderAck>
        <messageControlId>4088821315</messageControlId>
        <orderTransactionUid>bd83bdd97f000101014e590534ffefa0</orderTransactionUid>
      </ns2:Result>
    </ns2:submitOrderResponse>
  </S:Body>
</S:Envelope>
```

Order document request

The following sample is a request for an ABN, a requisition (REQ), and AOE questions. To request just an ABN, a requisition, or AOE questions, submit only 1 of the orderSupportRequests elements. (The XML SOAP envelope and header tags have been omitted.)

Note: Only a single request sample is shown because the format is identical for all request types. The sample responses, however, illustrate a separate response for each request type. When multiple request types are submitted simultaneously, the responses are combined into a single response, which may contain 1 or more [OrderSupportDocument](#) attributes.

```
<soapenv:Body>
  <ord:getOrderDocuments>
    <ord:getOrderDocumentsRequest>
      <hl7Order>TVN1ff5+XCZ8Q1RGV3w5OTk5OTA1Nnx8TkVMfDIwMT...
                Base64-encoded content truncated
      </hl7Order>
      <orderSupportRequests>ABN</orderSupportRequests>
      <orderSupportRequests>REQ</orderSupportRequests>
      <orderSupportRequests>AOE</orderSupportRequests>
    </ord:getOrderDocumentsRequest>
  </ord:getOrderDocuments>
</soapenv:Body>
```

Sample XML responses are provided for the following:

- “ABN not required” below
- “ABN required” on the next page
- “Requisition generated” on the next page
- “AOE not required” on page 93
- “AOE required—First response (with URL)” on page 93
- “AOE required—Second response (with order)” on page 94

Order document responses

ABN not required

The following response indicates that no ABN is required. (The XML SOAP envelope tags have been omitted.)

```
<S:Body>
  <ns2:getOrderDocumentsResponse xmlns:ns2="http://quantum.com/orders">
    <ns2:Result>
      <status>SUCCESS</status>
      <hl7OrderAck>TVN1ff5+XCZ8fEJyZW50IFByb3ZpZGVyfEhVQ1d...
                Base64-encoded content truncated
      </hl7OrderAck>
      <messageControlId>TEST005</messageControlId>
      <orderTransactionUid>d64bdc6aac1262891b2f424d7068ff35</orderTransactionUid>
      <orderSupportDocuments>
        <documentType>ABN</documentType>
        <requestStatus>0000: Processing Completed Successfully</requestStatus>
        <responseMessage>ABN is not required</responseMessage>
      </orderSupportDocuments>
    </ns2:Result>
  </ns2:getOrderDocumentsResponse>
</S:Body>
```

```

        <success>true</success>
    </orderSupportDocuments>
</ns2:Result>
</ns2:getOrderDocumentsResponse>
</S:Body>

```

ABN required

The following response indicates that an ABN is required, and the ABN PDF is included as a Base64-encoded element.

Note: For a brief description of decoding Base64, see “Decoding Base64 PDFs” on page 479.

The XML SOAP envelope tags have been omitted.

```

<S:Body>
  <ns2:getOrderDocumentsResponse xmlns:ns2="http://quanum.com/orders">
    <ns2:Result>
      <status>SUCCESS</status>
      <hl7OrderAck>TVNIffF5+XCZ8fEJyZW50IFByb3ZpZGVyfEhVQ1d...  

        Base64-encoded content truncated
      </hl7OrderAck>
      <messageControlId>123abcdef</messageControlId>
      <orderTransactionUid>bd2b08967f0001010150eab7ac17fb7</orderTransactionUid>
      <orderSupportDocuments>
        <documentData>JVBERi0xLjQKJeLjz9MKMyAwIG9iaia8PC9M...  

          Base64-encoded content truncated
        </documentData>
        <documentType>ABN</documentType>
        <requestStatus>0000: Processing Completed Successfully</requestStatus>
        <responseMessage>ABN is required</responseMessage>
        <success>true</success>
      </orderSupportDocuments>
    </ns2:Result>
  </ns2:getOrderDocumentsResponse>
</S:Body>

```

Requisition generated

The following response shows that a requisition has been generated.

Note: For a brief description of decoding Base64, see “Decoding Base64 PDFs” on page 479.

The XML SOAP envelope tags have been omitted.

```

<S:Body>
  <ns2:getOrderDocumentsResponse xmlns:ns2="http://quanum.com/orders">
    <ns2:Result>
      <status>SUCCESS</status>
      <hl7OrderAck>TVNIffF5+XCZ8fEJyZW50IFByb3ZpZGVyfEhVQ1d...  

        Base64-encoded content truncated
      </hl7OrderAck>
      <messageControlId>123abcdef</messageControlId>
      <orderTransactionUid>bd31565c7f0001010150eab6a65c959</orderTransactionUid>
    </ns2:Result>
  </ns2:getOrderDocumentsResponse>
</S:Body>

```

```
<orderSupportDocuments>
  <documentData>JVBERi0xLjQKJeLjz9MKMSAwIG9iaia8PC9D...
    Base64-encoded content truncated
  </documentData>
  <documentType>REQ</documentType>
  <requestStatus>0000: Processing Completed Successfully</requestStatus>
  <responseMessage>REQ OK</responseMessage>
  <success>true</success>
</orderSupportDocuments>
</ns2:Result>
</ns2:getOrderDocumentsResponse>
</S:Body>
```

AOE not required

The following response indicates that no AOE questions are required for the submitted order codes. As a result, the order is automatically submitted to the lab for processing. (The XML SOAP envelope tags have been omitted.)

```
<S:Body>
  <ns0:getOrderDocumentsResponse xmlns:ns0="http://quanum.com/orders">
    <ns0:Result>
      <status>SUCCESS</status>
      <hl7OrderAck>TVNIffF5+XCZ8fE5FTHxDVEZXfDk5OTk5MDU2fDIwMTQwODI5MDcwNzE3fHxPT1Je-
MDAyfE1FU
      1NBR0VDT1RSMTAyfFR8Mi4zDU1TQXxBQXxNRVNTQUdFQ05UUjEwMnw=</hl7OrderAck>
      <messageControlId>MESSAGECNTR102</messageControlId>
      <orderTransactionUid>232a216aac1262891d8af3f9f9dc4c8a</orderTransactionUid>
      <orderSupportDocuments>
        <documentType>AOE</documentType>
        <requestStatus>0000: Request processed</requestStatus>
        <success>>true</success>
      </orderSupportDocuments>
    </ns0:Result>
  </ns0:getOrderDocumentsResponse>
</S:Body>
```

AOE required—First response (with URL)

The following response indicates that 1 or more order codes require AOE questions to be answered. The documentData element returns the Base64-encoded URL for accessing the associated AOE questions. (The XML SOAP envelope tags have been omitted.)

```
<S:Body>
  <ns0:getOrderDocumentsResponse xmlns:ns0="http://quanum.com/orders">
    <ns0:Result>
      <status>SUCCESS</status>
      <hl7OrderAck>TVNIffF5+XCZ8fE5FTHxDVEZXfDk5OTk5MDU2fDIwMTQwODI5MDY1NzE5fHxPT1Je-
MDAyfE1FU
      1NBR0VDT1RSMTAyfFR8Mi4zDU1TQXxBQXxNRVNTQUdFQ05UUjEwMnw=</hl7OrderAck>
      <messageControlId>MESSAGECNTR102</messageControlId>
      <orderTransactionUid>2320ff62ac1262891d8af3f90d97426d</orderTransactionUid>

      <orderSupportDocuments>
        <documentType>AOE</documentType>
        <requestStatus>0000: Request processed</requestStatus>
        <responseMessage>Ordercodes requiring an answer = 599; 10809; AOE URL =
https://quanumqa.qdx.com/ssl/quanum.wls?MGWAPP=ewdwl&app=QA-
FUSION&
page=aoepsa&AOEToken=Y1oVzuSjyLO9aySKNjMqkcGFzC4BYwAhSz6R4V1Om05KgMkR-
9rwyG6F
7bfkhxUQkw69Ik6xwIxIx</responseMessage>
        <success>>true</success>
      </orderSupportDocuments>

      <orderSupportDocuments>
        <documentData>aHR0cHM6Ly9jYXJlMzYwcWEucWR4LmNvbS9z...
      </orderSupportDocuments>
    </ns0:Result>
  </ns0:getOrderDocumentsResponse>
</S:Body>
```

Base64-encoded content truncated

```
</documentData>
<documentType>AOEURL</documentType>
<requestStatus>0000: Processing Completed Successfully</requestStatus>
<success>>true</success>
</orderSupportDocuments>

</ns0:Result>
</ns0:getOrderDocumentsResponse>
</S:Body>
```

AOE required—Second response (with order)

The following response occurs after the client application user has answered the AOE questions, and the client application submits the AOE request a second time via the `getOrderDocuments` method. The `documentData` element contains the Base64-encoded HL7 order message, including the AOE questions and answers. (The XML SOAP envelope tags have been omitted.)

Note: For HL7 order message specifications, including the OBX segment(s) containing the AOE questions and answers, see [Chapter 6, “Order HL7 2.3 specification”](#) beginning on page 101, [Chapter 7, “Order HL7 2.3.1 specification”](#) beginning on page 156, or [Chapter 8, “Order HL7 2.5.1 specification”](#) beginning on page 211.

```
<S:Body>
  <ns0:getOrderDocumentsResponse xmlns:ns0="http://quanum.com/orders">
    <ns0:Result>
      <status>SUCCESS</status>
      <hl7OrderAck>TVNIffF5+XCZ8fE5FTHxDVEZXfDk5OTk5MDU2fDIwMTQwODI5MDcwMzAyfHxPT1Je-
MDAyfE1FU
      1NBR0VDT1RSMTAyfFR8Mi4zDU1TQXxBQXxNRVNTQUdFQ05UUjEwMnw=</hl7OrderAck>
      <messageControlId>MESSAGECNTR102</messageControlId>
      <orderTransactionUid>23263d49ac1262891d8af3f9b6977e66</orderTransactionUid>

      <orderSupportDocuments>
        <documentType>AOE</documentType>
        <requestStatus>0000: Request processed</requestStatus>
        <success>>true</success>
      </orderSupportDocuments>

      <orderSupportDocuments>
        <documentData>T0JSfDF8VEVTVDawOTV8fF5eXjU5OV5NSUNS...
          Base64-encoded content truncated
        </documentData>
        <documentType>AOEORDER</documentType>
        <requestStatus>0000: Processing Completed Successfully</requestStatus>
        <success>>true</success>
      </orderSupportDocuments>
    </ns0:Result>
  </ns0:getOrderDocumentsResponse>
</S:Body>
```

Acknowledgment of submitted orders

The Quantum Hub returns an acknowledgment (ACK) or negative acknowledgment (NAK) message for each order submission, including ABN, requisition, and AOE requests, to acknowledge receipt of the order and/or document request. ACK messages are constructed from the order that is submitted, and returned in the `hl7OrderAck` element of the `orderResponse` object within the response message. Orders with an ABN, requisition, and/or AOE request returns 1 of the following:

- **For an order with a successful ABN, REQ, and/or AOE request:** an HL7 ACK message is returned
- **For an order with a failed ABN, REQ, and/or AOE request:** an HL7 NAK message is returned

This section provides details on the ACK (or NAK) message that is returned by the Quantum Hub, and applies to all order message formats (HL7 2.3, 2.3.1, and 2.5.1) supported by the Quantum Hub.

Note: In the context of this chapter, a negative acknowledgment (NAK) message is an ACK message that contains an error condition; for example, Application Error (AE).

HL7 ACK message segment specifications

This section provides specifications for each segment of an HL7 ACK message that is returned by the Quantum Hub. Message segments include the following:

- “MSH—Message header” on the next page
- “MSA—Message acknowledgment” on page 98

Notes:

- In the following tables, the value 2.3.x indicates both HL7 2.3 and 2.3.1
- The HL7 2.3, 2.3.1, and 2.5.1 ACK message specifications include additional segments (in addition to MSH and MSA), but the Quantum Hub populates only these 2 segments; all other message segments can be ignored

Field specifications

The following table describes the parameters used to define the data fields within each message segment.

Parameter	Description
Required	The fields within each segment are classified based on their requirement status of Required (R), Optional (O), Conditional (C), or Not Supported (X) as defined below: <ul style="list-style-type: none">• Required. If the corresponding segment is present, the field must also be present within the segment, and the Quantum Hub validates it against any stated requirements. If the field is not present, the message is rejected by the Quantum Hub• Optional. The field is not required; the segment is accepted by the Quantum Hub whether or not this field is present. If the field is present, the Quantum Hub validates it against any stated requirements (The contents of this field will not be reflected in the lab result)• Not Supported. If a field is described as <i>Not Supported</i> (the corresponding fields appear in <i>gray text</i> in the table), the content of the field is not used by the lab
Type	An HL7 standard data type.
Length	The maximum allowed length for the field.
Repeat	Each field is classified with 1 of the following values: <ul style="list-style-type: none">• N: May not repeat• Y: May repeat any number of times• Y/n: May repeat up to <i>n</i> times

MSH—Message header

The Message Header (MSH) segment defines the intent, source, destination, and some specifics of the syntax of an HL7 message.

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.00	Segment Type Identifier	R	ST	4	N	This is MSH.
MSH.01	Field Separator	R	ST	1	N	This is always a vertical bar ().
MSH.02	Encoding Characters	R	ST	4	N	The following characters are used: <ul style="list-style-type: none">• ^ (component separator)• ~ (repetition separator)• \ (escape character)• & (sub-component separator)

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.03	Sending Application	O	HD	227 (2.5.1) 180 (2.3.x)	N	This contains the value of MSH.05 from the order message.
MSH.04	Sending Facility	R	HD	227 (2.5.1) 180 (2.3.x)	N	This contains the value of MSH.06 from the order message.
MSH.05	Receiving Application	O	HD	227 (2.5.1) 180 (2.3.x)	N	This contains the value of MSH.03 from the order message.
MSH.06	Receiving Facility	R	HD	227 (2.5.1) 180 (2.3.x)	N	This contains the value of MSH.04 from the order message.
MSH.07	Date/Time of Message	R	TS	26	N	The current date and time, formatted as YYYYMMDDHHMMSS. Note: All date timestamps are set to Coordinated Universal Time (UTC).
MSH.08	Security	X				
MSH.09	Message Type	R	MSG (2.5.1) CM (2.3.x)	15	N	For HL7 2.5.1 (type = MSG), this contains ORL^O22. For HL7 2.3.x (type = CM), this contains OOR^O02.
MSH.10	Message Control ID	R	ST	20	N	This contains the value of MSH.10 from the order message.
MSH.11	Processing ID	R	PT	3	N	Depending on the environment, this contains 1 of the following values: <ul style="list-style-type: none"> • P: Production • T: Training • D: Debug (Development)

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.12	Version ID	R	VID	60	N	This contains the value of MSH.12 from the order message (2.3, 2.3.1, or 2.5.1).
MSH.13	Sequence Number	X				
MSH.14	Continuation Pointer	X				
MSH.15	Accept Acknowledgment Type	X				
MSH.16	Application Acknowledgment Type	X				
MSH.17	Country Code	X				
MSH.18	Character Set	X				
MSH.19	Principal Language of Message	X				
MSH.20	Alternate Character Set Handling Scheme	X				
MSH.21	Message Profile Identifier	X				

MSA—Message acknowledgment

The Message Acknowledgment (MSA) segment defines acknowledgment (ACK) message that is returned for an order.

Field	Name	Req'd	Type	Length	Repeat	Comments
MSA.00	Segment Type Identifier	R	ST	4	N	This is MSA.
MSA.01	Acknowledgment Code	R	ID	2	N	This indicates the status of the most recently received message. Valid acknowledgment codes are shown in Acknowledgment codes .
MSA.02	Message Control ID	R	ST	20	N	This contains the value of MSH.10 from the order message.

Field	Name	Req'd	Type	Length	Repeat	Comments
MSA.03	Text Message	0	ST	80	N	This is blank.
MSA.04	Expected Sequence Number	0	ST (2.5.1) NM (2.3.x)	15	N	This is blank.
MSA.05	Delayed Acknowledgment Type	X 0	(2.5.1) ID (2.3.x)	(2.5.1) 1 (2.3.x)	N	This is blank.
MSA.06	Error Condition	0	CE	250	N	For a <code>SUCCESS</code> status, the value is blank. For an <code>ERROR</code> status (<i>Acknowledgment Code</i> = <code>AE</code>), MSA.06.01 (<i>Code</i>) is blank, and MSA.06.02 (<i>Description</i>) contains the error description.

Acknowledgment codes

The HL7 acknowledgment codes that are returned in the `MSA` segment are described below.

- To acknowledge the successful receipt and processing of an order (`status = SUCCESS`), the following code is returned:

AA Enhanced mode: Application Acknowledgment: Accept

- To acknowledge an order that was **not** successfully received and processed (`status = ERROR`), the following code is returned:

AE Enhanced mode: Application Acknowledgment: Error

Sample HL7 ACK messages

The following is an example of an ACK message:

```
MSH|^~\&||Provider Name|HUBWS|Provider
Account|20240115031620||OOR^O02|bso004|D|2.5.1
MSA|AA|bso004|
```

The following is an example of a NAK message:

```
MSH|^~\&||Provider Name|HUBWS|Provider
Account|20240115041423||ORL^O22|bso005|D|2.5.1
MSA|AE|bso005||||^Order message version '2.5.1' does not match the resolved Quantum
Hub Account order
version '2.3'
```

About the WSDL interface document

In order to utilize a web service, you must develop a web service client application. A client application created for accessing the Order Submission web service is referred to as a *static* web service client, because the client knows where the web service is located without looking up the service in a *Universal Description, Discovery, and Integration* (UDDI) registry. The client calls the web services via a known service URL to obtain the Web Services Definition Language (WSDL) file that describes the web services.

A WSDL interface document describes all of the information that is needed by a web service client to interact with the associated web service. The WSDL document includes the URL to locate the associated web services. Once you have obtained the WSDL, you can build a client application that uses the web service to perform the desired functions.

The following section describes how to obtain the WSDL document for the Order Submission web service.

Note: Your Quest credentials are required in order to access Quantum Hub web services such as the WSDL interface document. For the Production environment, credentials are issued once your client application has been developed, tested, and certified.

Accessing the Order Submission web service WSDL document

To access the WSDL service description for the Order Submission web service, use your browser to access the URL corresponding to one of the following Quantum Hub environments:

- **Certification environment.** Use this environment for developing, testing, and certifying your client application. For the Certification environment URL and endpoint, see “[Certification environment](#)” below
- **Production environment.** Use this environment after your client application has been certified. For the production environment URL and endpoint, see “[Production environment](#)” below

To save the WSDL document, access the document using your browser and then select *File > Save As*.

Certification environment

To access the Order Submission web service in the Certification environment, access the following endpoint:

<https://certhubservices.quantum.com/orders/submission/service>

Production environment

Once you have developed, tested, and certified your client application in the Certification environment, you can then update the application to work in the Production environment. Connecting a client application to the Production environment is similar to connecting to the Certification environment (the exposed interfaces are equivalent).

Note: Client applications developed against the Certification environment WSDL document can also be used to access the Production environment, and vice versa; the WSDL content is identical in both environments.

To access the Order Submission web service in the Production environment, access the following endpoint:

<https://hubservices.quantum.com/hub-ws-resource-server/oauth2/orders/submission/service>

Chapter 6: Order HL7 2.3 specification

In this chapter:

- About the Order HL7 2.3 Specification 102
- Order HL7 2.3 message format requirements 103
- Order HL7 2.3 message segment specifications 108
- Sample order HL7 2.3 messages 154

About the *Order HL7 2.3 Specification*

This chapter provides detailed format specifications for lab orders that are submitted via the Quantum Hub to a Quest Diagnostics lab for processing. Orders must be formatted according to the *HL7 2.3 Specification*, with any exceptions noted in this chapter. Supported messages for orders include:

This chapter includes the following sections:

- **Order message format requirements.** For information on the message format requirements, see [“Order HL7 2.3 message format requirements” on the next page](#)
- **Order message segment specifications.** Each order message submitted to the Quantum Hub must contain a number of standard sections. For requirements on the standard segments of an order message, see [“Order HL7 2.3 message segment specifications” on page 108](#)
- **Sample order messages.** For samples of the various order message types, see [“Sample order HL7 2.3 messages” on page 154](#)

Note: For a detailed specification of Quest results that are received by the Quantum Hub, see [Chapter 15, “Lab results HL7 2.3/2.3.1 specification” beginning on page 441](#) or [Chapter 16, “Lab results HL7 LRI 2.5.1 specification” beginning on page 485](#).

Order HL7 2.3 message format requirements

In addition to the field-level validation detailed in “[Order HL7 2.3 message segment specifications](#)” on [page 108](#), each inbound ORM message is validated to ensure compliance with the rules outlined in this section.

Message segment hierarchy

ORM messages must follow the message segment hierarchy specified below:

MSH	Message Header (<i>Required</i>)
[{NTE}]	Notes and Comments (<i>Optional</i>)
PID	Patient Identification (<i>Required</i>)
[{NTE}]	Notes and Comments (<i>Optional</i>)
[PV1]	Patient Visit Data (<i>Optional</i>)
[{IN1}]	Insurance Information (<i>Required</i>)
[GT1]	Guarantor (<i>Conditional</i>)
{	
ORC	Common Order (<i>Required</i>)
[{NTE}]	Notes and Comments (<i>Optional</i>)
OBR	Observation request (<i>Required</i>)
[{NTE}]	Notes and Comments (<i>Optional</i>)
[{DG1}]	Diagnosis (<i>Optional</i>)
[{OBX}]	Observation/Result (<i>Conditional</i>)
}	

In the hierarchy shown above, braces ({ }) indicate where multiple items are allowed, and brackets ([]) indicate items that are optional and/or conditional.

Message segment requirements

The following table classifies the various ORM message segments based on their requirement status of Required (R), Optional (O), or Conditional (C) as defined below:

- **Required.** The segment must be present in the ORM message. If it is not present, the message is rejected by the Quantum Hub
- **Optional.** The segment is not required. The ORM message is accepted by the Quantum Hub whether or not this segment is present. If the segment is present, the Quantum Hub validates the associated field requirements as noted in the *Comments/Conditions* column of the table below
- **Conditional.** The segment may or may not be required in the ORM message, depending on certain conditions. Conditions are stipulated in the *Comments/Conditions* column of the table below. If the segment is present, the Quantum Hub validates the associated field requirements

Note: This table is only meant to communicate segment requirements; that is, whether or not a segment in the ORM message must be present, and, if present, how many of these segments can occur. The requirements listed in the table are over and above the field requirements detailed in “[Order HL7 2.3 message segment specifications](#)” on [page 108](#). For example, if an ORM passes the segment level rules detailed in the following table, the message can still fail the field-level rules for any of the existing segments.

Segment	Req'd	Comments/conditions
MSH: Message Header	R	The Quantum Hub verifies that this segment is present in the ORM message.
PID: Patient Identifier	R	The Quantum Hub verifies the following: <ul style="list-style-type: none"> • This segment is present in the ORM message • There is only 1 PID in the ORM message
PV1: Patient Visit Data	O	If present, the Quantum Hub passes the PV1 segments through.
IN1: Insurance	R	This segment is required for all bill types (<i>Client Bill</i> (C), <i>Patient Bill</i> (P), and <i>Third-Party Bill</i> (T)). The Quantum Hub verifies that no more than 2 IN1 segments exist in the ORM message. While 2 are accepted, the primary insurance information must be in the first IN1 segment, the secondary insurance information in the second IN1 segment. The Quantum Hub passes 2 IN1 segments, if 2 are received. If only 1 IN1 is received, only 1 IN1 is passed through.
GT1: Guarantor	C	The Quantum Hub verifies that this segment is present if required by the bill type designated by IN1.47 (<i>Coverage Type</i>), as outlined below: <ul style="list-style-type: none"> • If IN1.47 = P (<i>Patient Bill</i>), the GT1 segment is optional • If IN1.47 = C (<i>Client Bill</i>), the GT1 segment is optional • If IN1.47 = T (<i>Third-Party Bill</i>), the GT1 segment is required If present, the Quantum Hub also verifies that there is only 1 GT1 segment in the ORM message.
ORC: Common Order	R	The Quantum Hub verifies the following: <ul style="list-style-type: none"> • This segment is present in the ORM message • For each ORC segment, there is 1—and only 1—OBR segment in the ORM message ORC and OBR segments should be paired as follows: <pre>MSH PID ORC OBR 1 ORC OBR 1 ORC OBR 1 </pre>
OBR: Observation Request	R	The Quantum Hub verifies the following: <ul style="list-style-type: none"> • This segment is present in the ORM message • Each OBR segment is paired with an ORC segment • Only 1 OBR is associated with an ORC segment

Segment	Req'd	Comments/conditions
		Note: The Quantum Hub does not check the content of the OBR to verify if the Order Codes are duplicated in the ORM message.
DG1: Diagnosis	0	<p>A maximum of 12 unique ICD-10 codes are permitted in an ORM message. Downstream clinical and administrative systems may not be able to successfully process the order if the content of this segment exceeds a total of 12 unique ICD-10 codes. Therefore, it is recommended that the sending system not exceed this limit.</p> <p>If present, the Quantum Hub verifies that all of the required data in this segment is present and in compliance with the format rules.</p> <p>Note: The Quantum Hub does not check the content of the fields, and does not perform business logic checks across multiple DG1 segments.</p>
OBX: Observation Result Detail	C	AOEs associated with the order are captured as one-to-many OBX segments. If present, the Quantum Hub passes the segment through, if the data in the segment complies with the field-level rules detailed in “Order HL7 2.3 message segment specifications” on page 108.
NTE: Notes and Comments	0	<p>If present, the rules for an ORM message include the following:</p> <ul style="list-style-type: none"> • Internal comments (NTE.02 is set to I). Internal comments provide additional information helpful in proper testing or reporting. Internal comments will not appear on the report. For normal orders, only 5 NTE segments of 60 characters each (NTE.03 field width) are utilized by the lab. For PSC Hold orders, only the first 60 characters will be read • Report comments (NTE.02 is set to R). Report comments are sent to the lab to be placed on the report. For normal orders, only 2 NTE segments of 60 characters each (NTE.03 field width) are utilized by the lab. For PSC Hold orders, only the first 60 characters will be read <p>NTE segments can follow MSH, PID, ORC, and OBR segments in the order message.</p>

Store and forward

At the order code level, OBR.18 and OBR.19 are used as “store and forward” fields by the Quantum Hub. The Quantum Hub stores the data sent in these fields per order code, and verifies that the fields are blank when it passes them through.

At the test code level, the value for each unique occurrence of OBR.04 is preserved along with the corresponding set of OBR.18 and OBR.19 values. The Quantum Hub verifies that a value for OBR.04 is present (specifically, OBR.04.04 and OBR.04.05).

When results are returned, the Quantum Hub matches the result to the corresponding order message and inserts the OBR.18, OBR.19, and OBR.04 data into the result.

Order-result matching

Results are matched to orders as follows:

- The Quantum Hub compares the key fields of ORC.02, MSH.04, and MSH.06 in the ORU message to ORC.02, MSH.06, and MSH.04 in the ORM message. If there are multiple possible matches, PID.02 of the ORU message is compared to PID.02 of the ORM message to determine the correct match. Then, additional matching is done at the test code level using the following criteria:
 - **Criterion 1: OBR.04.01 in the ORU message is matched to OBR.04.04 in the ORM message.** If this match is successful, the store and forward fields are populated. Otherwise, the criterion below is checked
- Note:** If there are duplicate test codes (OBR.04.04) in the order, the Quantum Hub uses the first duplicated test code value for the order-result matching.
- **Criterion 2: OBR.04.01 in the ORU message is matched to OBR.04.01 in the ORM message.** If this match is successful, the store and forward fields are populated
 - If a result cannot be matched to an order using the method described above, the store and forward fields will not be populated in the outbound result file

If necessary, other store and forward fields can be defined. To define different or additional store and forward fields, consult with the project manager during the certification process.

Newline characters

Order HL7 messages must use the carriage return (CR) character (ASCII 0x0D) to indicate a segment delimiter. Order messages that contain a line feed (LF) character (ASCII 0x0A) or CRLF character (ASCII 0x0D0A) to indicate a segment delimiter will be rejected.

Field delimiters

A delimiter must separate each field. Even if a field contains no data, it must still be delimited. The delimiter for any given HL7 message is always defined in the MSH segment of the message, as the first character following the segment identifier (MSH.00). See the message segment descriptions for more detail. Standard HL7 delimiters are used.

Note: The standard HL7 delimiters (| ^ ~ \ &) are only accepted in MSH.02.

Field specifications

The following table describes the parameters used to define the data fields within each message segment.

Parameter	Description
Required	<p>The fields within each segment are classified based on their requirement status of Required (R), Optional (O), Conditional (C), or Not Supported (X) as defined below:</p> <ul style="list-style-type: none">• Required. If the corresponding segment is present, the field must also be present within the segment, and the Quantum Hub validates it against any stated requirements. If the field is not present, the message is rejected by the Quantum Hub• Optional. The field is not required; the segment is accepted by the Quantum Hub whether or not this field is present. If the field is present, the Quantum Hub validates it against any stated requirements (The contents of this field will not be reflected in the lab result)• Conditional. The field may or may not be required, depending on certain conditions (stipulated in the <i>Comments</i> column of each segment table). If the stated conditions are not met, the message is rejected by the Quantum Hub. If the field is present, the Quantum Hub validates it against any stated requirements (The contents of this field may or may not be reflected in the lab result)• Not Supported. If a field is described as <i>Not Supported</i> (the corresponding fields appear in <i>gray text</i> in the table), the content of the field is not used by the lab
Type	An HL7 standard data type as defined in the <i>HL7 2.3 Specification</i> .
Length	The maximum allowed length for the field.
Repeat	<p>Each field is classified with 1 of the following values:</p> <ul style="list-style-type: none">• N: May not repeat• Y: May repeat any number of times• Y/n: May repeat up to <i>n</i> times

Order HL7 2.3 message segment specifications

This section provides detailed specifications for each segment of an HL7 order message. Message segments include the following:

- “MSH—Message Header segment” below
- “PID—Patient Identifier segment” on page 111
- “PV1—Patient Visit Data segment” on page 119
- “IN1—Insurance segment” on page 123
- “GT1—Guarantor segment” on page 130
- “ORC—Common Order segment” on page 136
- “OBR—Observation Request segment” on page 140
- “DG1—Diagnosis segment” on page 148
- “OBX—Observation/Result segment” on page 149
- “NTE—Notes and Comments segment” on page 151

Notes:

- Order message segments that are not supported are not included in this section; for detailed specifications of those segments, refer to the *HL7 Standard*
- If 1 or more of the unsupported segments are submitted, the order message will be accepted as long as it is formatted to the published *HL7 Standard*

MSH—Message Header segment

The Message Header (MSH) segment defines the intent, source, destination, and some specifics of the syntax of a message.

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.00	Segment Type ID	R	ST	4	N	This is MSH.
MSH.01	Field Separator	R	ST	1	N	The separator between the message segment ID (MSH) and the first data field (MSH.02), which defines the character to be used as a separator for the rest of the message. This is always a vertical bar ().
MSH.02	Encoding Characters	R	ST	4	N	The following characters may be used: <ul style="list-style-type: none">• ^ (component separator)• ~ (repetition separator)• \ (escape character)

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> • & (sub-component separator) <p>These values are recommended by HL7, and are the only values supported by the Quantum Hub.</p>
MSH.03	Sending Application	O	HD	180	N	The name of the sending application.
03.01	Namespace ID	O	IS			
03.02	Universal ID	O	ST			
03.03	Universal ID Type	O	ID			
MSH.04	Sending Facility	R	HD	180	N	The sending facility. This is the account number(s) defined for the placer.
04.01	Namespace ID	R	IS			
04.02	Universal ID	O	ST			
04.03	Universal ID Type	O	ID			
MSH.05	Receiving Application	C	HD	180	N	<p>The receiving application identifier.</p> <p>For PSC Hold orders, this field must be populated with PSC. Otherwise, the order is considered to be a basic lab order.</p>
05.01	Namespace ID	O	IS			
05.02	Universal ID	O	ST			
05.03	Universal ID Type	O	ID			
MSH.06	Receiving Facility	R	HD	180	N	The receiving facility. This is the three-letter ID of the lab that performs the test.
06.01	Namespace ID	R	IS			
06.02	Universal ID	O	ST			
06.03	Universal ID Type	O	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.07	Date/Time of Message	R	TS	26	N	The date and time that the sending system created the message, formatted as YYYYMMDDHHMMSS.
MSH.08	Security	X				
MSH.09	Message Type	R	CM	7	N	The type of message being transmitted, and the event leading to the creation of the message. The acceptable value for this field is ORM^O01 (order messages).
09.01	Message Type	R	ID			This must be ORM.
09.02	Trigger Event	R	ID			This must be O01.
MSH.10	Message Control ID	R	ST	20	N	A number or other data that uniquely identifies the message in its transmission to the lab system. If not provided, the Quantum Hub populates this field with a unique identifier (a date/time stamp followed by a 4-digit random number).
MSH.11	Processing ID	R	PT	3	N	This indicates whether this message is intended to be processed as a production, test, or debug message. The Quantum Hub verifies that the value in this field is 1 of the following: <ul style="list-style-type: none"> • P: Production • T: Training • D: Debug (Development)
11.01	Processing ID	R	ID			
11.02	Processing Mode	O	ID			
MSH.12	Version ID	R	ID	8	N	The value for this field is 2.3.

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.13	Sequence Number	O	NM	15	N	This is used for sequence number when sending new, changed, or canceled orders for existing PSC Hold orders. The Quantum Hub does no validations on this field.
MSH.14	Continuation Pointer	X				
MSH.15	Accept Acknowledgment Type	X				
MSH.16	Application Acknowledgment Type	X				
MSH.17	Country Code	X				
MSH.18	Character Set	X				
MSH.19	Principal Language of Message	X				

PID—Patient Identifier segment

The Patient Identifier (PID) segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.00	Segment Type ID	R	ST	4	N	This field must be PID.
PID.01	Set ID	O	SI	4	N	This field allows identification of multiple PID segments within a message, and is usually a sequential number beginning with 1.
PID.02	Patient ID (External ID)	R	CX	20	N	The placer's patient ID assigned to this order. The Quantum Hub verifies that no reserved characters (^~\&) are present.
02.01	ID Number	R	ST			
02.02	Check Digit	O	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
02.03	Code Identifying the Check Digit Scheme Employed	0	ID			
02.04	Assigning Authority	0	HD			
02.04.01	Namespace ID	0	IS			
02.04.02	Universal ID	0	ST			
02.04.03	Universal ID Type	0	ID			
02.05	Identifier Type Code	0	ID			
02.06	Assigning Facility	0	HD			
02.06.01	Namespace ID	0	IS			
02.06.02	Universal ID	0	ST			
02.06.03	Universal ID Type	0	ID			
PID.03	Patient ID (Internal ID)	0	CX	250	Y	This is a repeating field and has a maximum length of 250 characters for each repeat of data.
03.01	ID Number	0	ST			This is the ID number defined by the <i>Assigning Authority</i> .
03.02	Check Digit	0	ST			
03.03	Code Identifying the Check Digit Scheme Employed	0	ID			
03.04	Assigning Authority	0	HD			<p>If no <i>Assigning Authority</i> is present, the Quantum Hub assumes that the ID Number is a patient ID.</p> <p>The valid values for <i>Assigning Authority</i> are:</p> <ul style="list-style-type: none"> • MRN: Medical Record Number • CID: Chart ID

Field	Name	Req'd	Type	Length	Repeat	Comments
03.04.01	Namespace ID	0	IS			
03.04.02	Universal ID	0	ST			
03.04.03	Universal ID Type	0	ID			
03.05	Identifier Type Code	0	ID			
03.06	Assigning Facility	0	HD			
03.06.01	Namespace ID	0	IS			
03.06.02	Universal ID	0	ST			
03.06.03	Universal ID Type	0	ID			
03.07	Effective Date	0	DT			
03.08	Expiration Date	0	DT			
03.09	Assigning Jurisdiction	0	CWE			
03.09.01	Identifier	0	ST			
03.09.02	Text	0	ST			
03.09.03	Name of Coding System	0	ID			
03.09.04	Alternate Identifier	0	ST			
03.09.05	Alternate Text	0	ST			
03.09.06	Name of Alternate Coding System	0	ID			
03.09.07	Coding System Version ID	0	ST			
03.09.08	Alternate Coding System Version ID	0	ST			
03.09.09	Original Text	0	ST			
03.10	Assigning Agency or Department	0	CWE			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.10.01	Identifier	0	ST			
03.10.02	Text	0	ST			
03.10.03	Name of Coding System	0	ID			
03.10.04	Alternate Identifier	0	ST			
03.10.05	Alternate Text	0	ST			
03.10.06	Name of Alternate Coding System	0	ID			
03.10.07	Coding System Version ID	0	ST			
03.10.08	Alternate Coding System Version ID	0	ST			
03.10.09	Original Text	0	ST			
PID.04	Alternate Patient ID	0	CX	20	Y	
04.01	ID Number	0	ST			
04.02	Check Digit	0	ST			
04.03	Code Identifying the Check Digit Scheme Employed	0	ID			
04.04	Assigning Authority	0	HD			
04.04.01	Namespace ID	0	IS			
04.04.02	Universal ID	0	ST			
04.04.03	Universal ID Type	0	ID			
04.05	Identifier Type Code	0	ID			
04.06	Assigning Facility	0	HD			
04.06.01	Namespace ID	0	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
04.06.02	Universal ID	O	ST			
04.06.03	Universal ID Type	O	ID			
PID.05	Patient Name	R	XPN	24	Y	<p>This field must adhere to the following:</p> <ul style="list-style-type: none"> • No reserved characters (~\&) are allowed (verified by the Quantum Hub) • A numeric value cannot be used as the first character of the last name • There must be at least 1 character for first and last name • The entire patient name (excluding the delimiter) cannot exceed 24 characters, with the following constraints for the subfields: <ul style="list-style-type: none"> • The last name can be a maximum of 20 characters. Any last name longer than the allowed limit is truncated in the corresponding result message • The first name is limited to the difference between the number of characters in the last name and 24 For example, if the last name is 14 characters, the first name is limited to 10 characters. Any first name longer than the allowed limit is truncated in the corresponding result message • If the middle name is within the entire name limit of 24 characters, it is returned in the corresponding result message

Field	Name	Req'd	Type	Length	Repeat	Comments
						<p>Otherwise, if the limit is exceeded, a minimum of the first character of the middle initial is always returned in the result message</p> <p>Note: These length limitations do not apply to requisitions and ABNs generated via the RESTful and SOAP-based Order Submission web services. Names appear on the requisitions and ABNs as they are submitted in the order message.</p>
05.01	Family Name	R	ST			
05.02	Given Name	R	ST			
05.03	Middle Initial or Name	O	ST			
05.04	Suffix	O	ST			
05.05	Prefix	O	ST			
05.06	Degree	O	IS			
05.07	Name Type Code	O	ID			
05.08	Name Representation Code	O	ID			
PID.06	Mother's Maiden Name	X				
PID.07	Date/Time of Birth	R	TS	26	N	<p>This field is the date of birth (DOB), formatted as:</p> <p>yyyymmddhhmm</p>
PID.08	Sex	R	IS	1	N	<p>This is the patient's sex. The valid values for this field are:</p> <ul style="list-style-type: none"> • M: Male • F: Female
PID.09	Patient Alias	X				
PID.10	Race	O	CE	250	N	<p>This is the patient's race. This field is populated with the value that was sent in the order message.</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.11	Patient Address	C	XAD	106	Y	<p>This field is the patient's address, formatted as:</p> <pre>1000 Parkway Drive^Apt. 4^ Mason^OH^45040^^^^^</pre> <p>This field is required if IN1.47 (<i>Coverage Type</i>) is P or T.</p>
11.01	Street Address	C	ST			
11.02	Other Designation	C	ST			
11.03	City	C	ST			
11.04	State or Province	C	ST			
11.05	Zip or Postal Code	C	ST			
11.06	Country	C	ID			
11.07	Address Type	C	ID			
11.08	Other Geographic Designation	C	ST			
11.09	County or Parish Code	C	IS			
11.10	Census Tract	C	IS			
11.11	Address Representation Code	C	ID			
PID.12	County Code	X				
PID.13	Phone Number - Home	C	XTN	250	Y	<p>This is the patient's home phone number.</p> <p>Phone number components are as follows, with PID 13.06 for the area code and PID 13.07 for the phone number.</p> <p>For backward compatibility, phone numbers sent in the 10-digit format (for example, 3148721727) or any of the following variations for sending data in the XTN data format will also be accepted:</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
						3148727127^^^^^^^ or 3148727127^^^^^314^8727127^ ^ or ^^^^^314^8727127^^ or 3148727127 This field is required if IN1.47 (Coverage Type) is P or T.
13.01	Phone Number String	C	ST			
13.02	Tele-communication Use Code	C	ID			
13.03	Tele-communication Equipment Type	C	ID			
13.04	Email Address	C	ST			
13.05	Country Code	C	NM			
13.06	Area or City Code	C	NM			
13.07	Phone Number	C	NM			
13.08	Extension	C	NM			
13.09	Any Text	C	ST			
PID.14	Phone Number - Business	X				
PID.15	Primary Language	X				
PID.16	Marital Status	X				
PID.17	Religion	X				
PID.18	Patient Account Number	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.19	SSN Number - Patient	X				
PID.20	Driver's Lic Num - Patient	X				
PID.21	Mother's Identifier	X				
PID.22	Ethnic Group	O	CE	3	N	
PID.23	Birth Place	X				
PID.24	Multiple Birth Indicator	X				
PID.25	Birth Order	X				
PID.26	Citizenship	X				
PID.27	Veterans Military Status	X				
PID.28	Nationality	X				
PID.29	Patient Death Date & Time	X				
PID.30	Patient Death Indicator	X				

PV1—Patient Visit Data segment

The Patient Visit Data (PV1) segment is used by registration/patient administration applications to communicate information on a visit-specific basis. This segment can be used to send multiple-visit statistic records to the same patient account, or single-visit records to more than 1 account.

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.00	Segment Type ID	R	ST	4	N	This field must be PV1.
PV1.01	Set ID	O	SI	4	N	This will always be 1.
PV1.02	Patient Class	X				
PV1.03	Assigned Patient Location	O	PL	80	N	This is the patient's current location (inpatient or outpatient).
03.01	Point of Care	O	IS			
03.02	Room	O	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.03	Bed	0	IS			
03.04	Facility	0	HD			
03.04.01	Namespace ID	0	IS			
03.04.02	Universal ID	0	ST			
03.04.03	Universal ID Type	0	ID			
03.05	Location Status	0	IS			
03.06	Patient Location Type	0	IS			
03.07	Building	0	IS			
03.08	Floor	0	IS			
03.09	Location Description	0	ST			
PV1.04	Admission Type	X				
PV1.05	Preadmit Number	X				
PV1.06	Prior Patient Location	X				
PV1.07	Attending Doctor	X				
PV1.08	Referring Doctor	X				
PV1.09	Consulting Doctor	X				
PV1.10	Hospital Service	X				
PV1.11	Temporary Location	X				
PV1.12	Preadmit Test Indicator	X				
PV1.13	Readmission Indicator	X				
PV1.14	Admit Source	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.15	Ambulatory Status	X				
PV1.16	VIP Indicator	X				
PV1.17	Admitting Doctor	X				
PV1.18	Patient Type	X				
PV1.19	Visit Number	X				
PV1.20	Financial Class	X				
PV1.21	Charge Price Indicator	X				
PV1.22	Courtesy Code	X				
PV1.23	Credit Rating	X				
PV1.24	Contract Code	X				
PV1.25	Contract Effective Date	X				
PV1.26	Contract Amount	X				
PV1.27	Contract Period	X				
PV1.28	Interest Code	X				
PV1.29	Transfer to Bad Debt Code	X				
PV1.30	Transfer to Bad Debt Date	X				
PV1.31	Bad Debt Agency Code	X				
PV1.32	Bad Debt Transfer Amount	X				
PV1.33	Bad Debt Recovery Amount	X				
PV1.34	Delete Account Indicator	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.35	Delete Account Date	X				
PV1.36	Discharge Disposition	X				
PV1.37	Discharged to Location	X				
PV1.38	Diet Type	X				
PV1.39	Servicing Facility	X				
PV1.40	Bed Status	X				
PV1.41	Account Status	X				
PV1.42	Pending Location	X				
PV1.43	Prior Temporary Location	X				
PV1.44	Admit Date/Time	O	TS	26	N	This is the hospital admission date, formatted as: yyyymmdd
PV1.45	Discharge Date/Time	X				
PV1.46	Current Patient Balance	X				
PV1.47	Total Charges	X				
PV1.48	Total Adjustments	X				
PV1.49	Total Payments	X				
PV1.50	Alternate Visit ID	X				
PV1.51	Visit Indicator	X				
PV1.52	Other Healthcare Provider	X				

IN1—Insurance segment

The Insurance (IN1) segment contains insurance policy coverage information necessary to produce properly pro-rated and patient and insurance bills. This segment is applicable only to the inbound order for insurance billing. The Quantum Hub verifies that all data fields are in uppercase.

Field	Name	Req'd	Type	Length	Repeat	Comments
IN1.00	Segment Type ID	R	ST	4	N	This field must be IN1.
IN1.01	Set ID	R	SI	4	N	IN1 message segments should be numbered sequentially from 1.
IN1.02	Insurance Plan ID	X				
IN1.03	Insurance Company ID	O	CX	15	Y	This is the QDI Bill mnemonic.
03.01	ID Number	O	ST			
03.02	Check Digit	O	ST			
03.03	Code Identifying the Check Digit Scheme Employed	O	ID			
03.04	Assigning Authority	O	HD			
03.04.01	Namespace ID	O	IS			
03.04.02	Universal ID	O	ST			
03.04.03	Universal ID Type	O	ID			
03.05	Identifier Type Code	O	ID			
03.06	Assigning Facility	O	HD			
03.06.01	Namespace ID	O	IS			
03.06.02	Universal ID	O	ST			
03.06.03	Universal ID Type	O	ID			
IN1.04	Insurance Company Name	C	XON	25	Y	This field is required if IN1.47 (Coverage Type) is T.
04.01	Organization Name	C	ST			
04.02	Organization Name Type Code	C	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
04.03	ID Number	C	NM			
04.04	Check Digit	C	NM			
04.05	Code Identifying the Check Digit Scheme Employed	C	ID			
04.06	Assigning Authority	C	HD			
04.06.01	Namespace ID	C	IS			
04.06.02	Universal ID	C	ST			
04.06.03	Universal ID Type	C	ID			
04.07	Identifier Type Code	C	ID			
04.08	Assigning Facility ID	C	HD			
04.08.01	Namespace ID	C	IS			
04.08.02	Universal ID	C	ST			
04.08.03	Universal ID Type	C	ID			
IN1.05	Insurance Company Address	C	XAD	106	Y	This field is required if IN1.47 (Coverage Type) is T.
05.01	Street Address	C	ST			
05.02	Other Designation	C	ST			
05.03	City	C	ST			
05.04	State or Province	C	ST			
05.05	Zip or Postal Code	C	ST			
05.06	Country	C	ID			
05.07	Address Type	C	ID			
05.08	Other Geographic Designation	C	ST			
05.09	County or Parish Code	C	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
05.10	Census Tract	C	IS			
IN1.06	Insurance Co. Contact Person	X				
IN1.07	Insurance Co Phone Number	X				
IN1.08	Group Number	C	ST	10	N	This field is required if IN1.47 (Coverage Type) is T. Valid values are: A-Z and 1-0.
IN1.09	Group Name	X				
IN1.10	Insured's Group Emp ID	X				
IN1.11	Insured's Group Emp Name	O	XON	18	Y	
11.01	Organization Name	O	ST			
11.02	Organization Name Type Code	O	IS			
11.03	ID Number	O	NM			
11.04	Check Digit	O	NM			
11.05	Code Identifying the Check Digit Scheme Employed	O	ID			
11.06	Assigning Authority	O	HD			
11.06.01	Namespace ID	O	IS			
11.06.02	Universal ID	O	ST			
11.06.03	Universal ID Type	O	ID			
11.07	Identifier Type Code	O	ID			
11.08	Assigning Facility ID	O	HD			
IN1.12	Plan Effective Date	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
IN1.13	Plan Expiration Date	X				
IN1.14	Authorization Information	X				
IN1.15	Plan Type	X				
IN1.16	Name Of Insured	C	XPN	24	Y	<p>This field is required if IN1.47 (Coverage Type) is \mathbb{T}. Entries must adhere to the following:</p> <ul style="list-style-type: none"> • A numeric value cannot be used as the first character of the last name • There must be at least 1 character for first and last name • The entire name (excluding the delimiter) cannot exceed 24 characters, with the following constraints for the subfields: <ul style="list-style-type: none"> • The last name can be a maximum of 20 characters. Any last name longer than the allowed limit is truncated in the corresponding result message • The first name is limited to the difference between the number of characters in the last name and 24 <p>For example, if the last name is 14 characters, the first name is limited to 10 characters. Any first name longer than the allowed limit is truncated in the corresponding result message</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> If the middle name is within the entire name limit of 24 characters, it is returned in the corresponding result message <p>Otherwise, if the limit is exceeded, a minimum of the first character of the middle initial is always returned in the result message</p>
16.01	Family Name	C	ST			
16.02	Given Name	C	ST			
16.03	Middle Initial or Name	C	ST			
16.04	Suffix	C	ST			
16.05	Prefix	C	ST			
16.06	Degree	C	IS			
16.07	Name Type Code	C	ID			
16.08	Name Representation Code	C	ID			
IN1.17	Insured's Relationship To Patient	C	IS	2	N	<p>This field is required if IN1.47 (Coverage Type) is \neq.</p> <p>Valid values for this field are:</p> <ul style="list-style-type: none"> 1: Self 2: Spouse 8: Dependent
IN1.18	Insured's Date Of Birth	X				
IN1.19	Insured's Address	C	XAD	106	Y	This field is required if IN1.47 (Coverage Type) is \neq .
19.01	Street Address	C	ST			
19.02	Other Designation	C	ST			
19.03	City	C	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
19.04	State or Province	C	ST			
19.05	Zip or Postal Code	C	ST			
19.06	Country	C	ID			
19.07	Address Type	C	ID			
19.08	Other Geographic Designation	C	ST			
19.09	County or Parish Code	C	IS			
19.10	Census Tract	C	IS			
IN1.20	Assignment Of Benefits	X				
IN1.21	Coordination Of Benefits	X				
IN1.22	Coord Of Ben. Priority	X				
IN1.23	Notice Of Admission Flag	X				
IN1.24	Notice Of Admission Date	X				
IN1.25	Report Of Eligibility Flag	X				
IN1.26	Report Of Eligibility Date	X				
IN1.27	Release Information Code	X				
IN1.28	Pre-Admit Cert (PAC)	X				
IN1.29	Verification Date/Time	X				
IN1.30	Verification By	X				
IN1.31	Type Of Agreement Code	X				
IN1.32	Billing Status	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
IN1.33	Lifetime Reserve Days	X				
IN1.34	Delay Before L.R. Day	X				
IN1.35	Company Plan Code	O	IS	8	N	This field further identifies an insurance plan.
IN1.36	Policy Number	C	ST	20	N	This is the individual policy number of the insured, and is required for Medicare submissions. This field is required if IN1.47 (Coverage Type) is T.
IN1.37	Policy Deductible	X				
IN1.38	Policy Limit - Amount	X				
IN1.39	Policy Limit - Days	X				
IN1.40	Room Rate - Semi-Private	X				
IN1.41	Room Rate - Private	X				
IN1.42	Insured's Employment Status	X				
IN1.43	Insured's Sex	X				
IN1.44	Insured's Employer Address	X				
IN1.45	Verification Status	X				
IN1.46	Prior Insurance Plan ID	X				
IN1.47	Coverage Type	C	IS	3	N	Valid values for this field are: <ul style="list-style-type: none"> T: Third-party bill P: Patient bill C: Client bill

Field	Name	Req'd	Type	Length	Repeat	Comments
						<p>Note: If IN1.47 = T, the GT1 segment is required.</p> <p>The rules for the IN1/GT1 segment are addressed in “Order HL7 2.3 message format requirements” on page 103.</p>
IN1.48	Handicap	X				
IN1.49	Insured’s ID Number	X				

GT1—Guarantor segment

The Guarantor (GT1) segment contains guarantor (for example, the person or the organization with financial responsibility for payment of a patient account) data for patient and insurance billing applications. This segment is applicable only to the inbound order for patient and insurance billing. The Quantum Hub verifies that all data fields are in uppercase.

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.00	Segment Type ID	R	ST	4	N	This field must be GT1.
GT1.01	Set ID	R	SI	4	N	GT1 message segments should be numbered sequentially from 1.
GT1.02	Guarantor Number	X				
GT1.03	Guarantor Name	C	XPN	24	Y	<p>This field is required if IN1.47 (<i>Coverage Type</i>) is P or T, and it must adhere to the following rules:</p> <ul style="list-style-type: none"> • No reserved characters (~\&) are allowed (verified by the Quantum Hub) • A numeric value cannot be used as the first character of the last name • There must be at least 1 character for first and last name • The entire name (excluding the delimiter) cannot exceed 24 characters, with the following constraints for the subfields:

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> The last name can be a maximum of 20 characters. Any last name longer than the allowed limit is truncated in the corresponding result message The first name is limited to the difference between the number of characters in the last name and 24 For example, if the last name is 14 characters, the first name is limited to 10 characters. Any first name longer than the allowed limit is truncated in the corresponding result message If the middle name is within the entire name limit of 24 characters, it is returned in the corresponding result message Otherwise, if the limit is exceeded, a minimum of the first character of the middle initial is always returned in the result message <p>Note: These length limitations do not apply to requisitions and ABNs generated via the RESTful and SOAP-based Order Submission web services. Names appear on the requisitions and ABNs as they are submitted in the order message.</p>
03.01	Family Name	C	ST			
03.02	Given Name	C	ST			
03.03	Middle Initial or Name	C	ST			
03.04	Suffix	C	ST			
03.05	Prefix	C	ST			
03.06	Degree	C	IS			
03.07	Name Type Code	C	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.08	Name Representation Code	C	ID			
GT1.04	Guarantor Spouse Name	X				
GT1.05	Guarantor Address	C	XAD	250	Y	This field is required if IN1.47 (<i>Coverage Type</i>) is P or T.
05.01	Street Address	C	ST			
05.02	Other Designation	C	ST			
05.03	City	C	ST			
05.04	State or Province	C	ST			
05.05	Zip or Postal Code	C	ST			
05.06	Country	C	ID			
05.07	Address Type	C	ID			
05.08	Other Geographic Designation	C	ST			
05.09	County or Parish Code	C	IS			
05.10	Census Tract	C	IS			
GT1.06	Guarantor Phone Number - Home	C	XTN	250	Y	<p>This is the guarantor's phone number. This field is required if IN1.47 (<i>Coverage Type</i>) is P or T. For backward compatibility, phone numbers sent in the 10-number format (for example, 3148721727) or any of the following variations for sending data in the XTN data format will also be accepted:</p> <p> 3148727127^^^^^^^^ ^ or 3148727127^^^^^314^8727127^^ or</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
						^^^^^314^8727127^^ or 3148727127
06.01	Phone Number String	C	ST			
06.02	Tele-communication Use Code	C	ID			
06.03	Tele-communication Equipment Type	C	ID			
06.04	Email Address	C	ST			
06.05	Country Code	C	NM			
06.06	Area or City Code	C	NM			
06.07	Phone Number	C	NM			
06.08	Extension	C	NM			
06.09	Any Text	C	ST			
GT1.07	Guarantor Phone Number - Business	X				
GT1.08	Guarantor Date/Time Of Birth	O	TS	26	Y	The date and time of the guarantor's birth, formatted as: yyyymmddhhmmss
GT1.09	Guarantor Sex	O	IS	1	Y	The guarantor's sex. Valid values for this field are: • M: Male • F: Female
GT1.10	Guarantor Type	X				
GT1.11	Guarantor Relationship	X				
GT1.12	Guarantor SSN	X				
GT1.13	Guarantor Date - Begin	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.14	Guarantor Date - End	X				
GT1.15	Guarantor Priority	X				
GT1.16	Guarantor Employer Name	X				
GT1.17	Guarantor Employer Address	X				
GT1.18	Guarantor Employer Phone Number	X				
GT1.19	Guarantor Employee ID Number	X				
GT1.20	Guarantor Employment Status	X				
GT1.21	Guarantor Organization Name	X				
GT1.22	Guarantor Billing Hold Flag	X				
GT1.23	Guarantor Credit Rating Code	X				
GT1.24	Guarantor Death Date And Time	X				
GT1.25	Guarantor Death Flag	X				
GT1.26	Guarantor Charge Adjustment Code	X				
GT1.27	Guarantor Household Annual Income	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.28	Guarantor Household Size	X				
GT1.29	Guarantor Employer ID Number	X				
GT1.30	Guarantor Marital Status Code	X				
GT1.31	Guarantor Hire Effective Date	X				
GT1.32	Employment Stop Date	X				
GT1.33	Living Dependency	X				
GT1.34	Ambulatory Status	X				
GT1.35	Citizenship	X				
GT1.36	Primary Language	X				
GT1.37	Living Arrangement	X				
GT1.38	Publicity Indicator	X				
GT1.39	Protection Indicator	X				
GT1.40	Student Indicator	X				
GT1.41	Religion	X				
GT1.42	Mother's Maiden Name	X				
GT1.43	Nationality	X				
GT1.44	Ethnic Group	X				
GT1.45	Contact Person's Name	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.46	Contact Person's Telephone Number	X				
GT1.47	Contact Reason	X				
GT1.48	Contact Relationship	X				
GT1.49	Contact Job Title	X				
GT1.50	Job Code/Class	X				
GT1.51	Guarantor Employer's Organization Name	X				
GT1.52	Handicap	X				
GT1.53	Job Status	X				
GT1.54	Guarantor Financial Class	X				
GT1.55	Guarantor Race	X				

ORC—Common Order segment

The Common Order (ORC) segment is used to transmit fields that are common to all orders (all types of services that are requested). The ORC segment is required in the ORM message.

Field	Name	Req'd	Type	Length	Repeat	Comments
ORC.00	Segment Type ID	R	ST	4	N	This field must be ORC.
ORC.01	Order Control	R	ID	2	N	This field accepts any order control code listed in the ORC.01 order control codes table (<i>HL7 table 0119—Order control</i>).
ORC.02	Placer Order Number	R	EI	20	N	The placer application's order number. The Quantum Hub verifies the following: <ul style="list-style-type: none"> This field is present

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> The value in ORC 02.01 (Entity Identifier) is the same as the value in OBR 02.01 (Entity Identifier) All values for this field in all ORC and OBR segments are identical <p>Otherwise, the order will be rejected.</p> <p>Note: The Quantum Hub does not require unique order numbers. The service provider is responsible for handling any duplicate order numbers that are received.</p>
02.01	Entity Identifier	R	ST			This must match OBR 02.01 (Entity Identifier) or the order will be rejected.
02.02	Namespace ID	O	IS			
02.03	Universal ID	O	ST			
02.04	Universal ID Type	O	ID			
ORC.03	Filler Order Number	X				
ORC.04	Placer Group Number	X				
ORC.05	Order Status	X	ID	2	N	
ORC.06	Response Flag	X				
ORC.07	Quantity/Timing	X				
ORC.08	Parent	X				
ORC.09	Date/Time of Transaction	X				
ORC.10	Entered By	X				
ORC.11	Verified By	O	XCN	250	Y	<p>This identifies the non-physician provider (NPP) who verified the accuracy of the entered request, formatted as:</p> <p>NPP_ID^NPP_Name</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
11.01	ID Number	0	ST			This is the NPP_ID.
11.02	Family Name	0	ST			This is the NPP_Name.
11.03	Given Name	0	ST			
11.04	Middle Initial or Name	0	ST			
11.05	Suffix	0	ST			
11.06	Prefix	0	ST			
11.07	Degree	0	IS			
11.08	Source Table	0	ST			
11.09	Assigning Authority	0	HD			
11.09.01	Namespace ID	0	IS			
11.09.02	Universal ID	0	ST			
11.09.03	Universal ID Type	0	ID			
11.10	Name Type Code	0	ID			
11.11	Identifier Check Digit	0	ST			
11.12	Code Identifying the Check Digit Scheme Employed	0	ID			
11.13	Identifier Type Code	0	IS			
11.14	Assigning Facility	0	HD			
11.14.01	Namespace ID	0	IS			
11.14.02	Universal ID	0	ST			
11.14.03	Universal ID Type	0	ID			
ORC.12	Ordering Provider	C	XCN	120	Y	This identifies the provider who ordered the test (same as OBR.16). This field is required if IN1.47 (Coverage Type) is P or T.
12.01	ID Number	C	ST			This is the NPI.

Field	Name	Req'd	Type	Length	Repeat	Comments
12.02	Family Name	C	ST			This is the ordering provider's last name.
12.03	Given Name	C	ST			This is the ordering provider's first name.
12.04	Middle Initial or Name	C	ST			This is the ordering provider's middle name or initial.
12.05	Suffix	C	ST			
12.06	Prefix	C	ST			
12.07	Degree	C	IS			
12.08	Source Table	C	ST			
12.09	Assigning Authority	C	HD			This is the NPI.
12.09.01	Namespace ID	C	IS			
12.09.02	Universal ID	C	ST			
12.09.03	Universal ID Type	C	ID			
12.10	Name Type Code	C	ID			
12.11	Identifier Check Digit	C	ST			
12.12	Code Identifying the Check Digit Scheme Employed	C	ID			
12.13	Identifier Type Code	C	IS			
12.14	Assigning Facility	C	HD			
12.14.01	Namespace ID	C	IS			
12.14.02	Universal ID	C	ST			
12.14.03	Universal ID Type	C	ID			
ORC.13	Enterer's Location	X				
ORC.14	Call Back Phone Number	X				
ORC.15	Order Effective Date/Time	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
ORC.16	Order Control Code Reason	X				
ORC.17	Entering Organization	X				
ORC.18	Entering Device	X				
ORC.19	Action By	X				

OBR—Observation Request segment

One OBR segment must be transmitted for each Order Code associated with any PID segment. This segment is mandatory in ORM messages.

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.00	Segment Type ID	R	ST	4	N	This must be OBR.
OBR.01	Set ID	O	SI	4	N	OBR segments are paired with an ORC segment; therefore, the sequence number will be 1.
OBR.02	Placer Order Number	R	EI	20	N	<p>The placer application's order number.</p> <p>The Quantum Hub verifies the following:</p> <ul style="list-style-type: none"> • This field is present • The value in ORC 02.01 (Entity Identifier) is the same as the value in OBR 02.01 (Entity Identifier) • All values for this field in all OBR and ORC segments are identical <p>Otherwise, the order will be rejected.</p> <p>Note: The Quantum Hub does not require unique order numbers. The service provider is responsible for handling any duplicate order numbers that are received.</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
02.01	Entity Identifier	R	ST			This must match ORC 02.01 (Entity Identifier) or the order will be rejected.
02.02	Namespace ID	O	IS			
02.03	Universal ID	O	ST			
02.04	Universal ID Type	O	ID			
OBR.03	Filler Order Number	X				
OBR.04	Universal Service ID	R	CE	200	N	<p>This is the identification code for the ordered test. One order code per OBR segment is allowed, formatted as:</p> <pre>^^^local_order_code^description</pre> <p>Note: The incoming order data is preserved for subsequent inclusion in matching result messages. For more information, see “Store and forward” on page 105.</p>
04.01	Identifier	O	ST			
04.02	Text	O	ST			
04.03	Name of Coding System	O	ID			
04.04	Alternate Identifier	R	ST			This is the <code>local_order_code</code> .
04.05	Alternate Text	R	ST			This is the <code>description</code> .
04.06	Name of Alternate Coding System	O	ID			
OBR.05	Priority (OBR.27)	X				
OBR.06	Requested Date/time	X				
OBR.07	Observation Date/Time	R	TS	26	N	This is the specimen collection date and time. This field is required if this is a PSC Hold order. This field is formatted as:

Field	Name	Req'd	Type	Length	Repeat	Comments
						yyyymmddhhmm Note: For PSC Hold orders, the client must be able to add a future collection date.
OBR.08	Observation End Date/Time	X				
OBR.09	Collection Volume	X				
OBR.10	Collector Identifier	X				
OBR.11	Specimen Action Code	O	ID	1	N	This is the action to be taken with respect to the specimens that accompany or precede this order.
OBR.12	Danger Code	X				
OBR.13	Relevant Clinical Info.	X				
OBR.14	Specimen Received Date/Time	X				
OBR.15	Specimen Source	X				
OBR.16	Ordering Provider	C	XCN	120	Y	This is the provider who ordered the test (same as ORC.12) and is required if IN1.47 (Coverage Type) is P or T.
16.01	ID Number	C	ST			<i>NPI_number</i>
16.02	Family Name	C	ST			This is the last name of the ordering provider.
16.03	Given Name	C	ST			This is the first name of the ordering provider.
16.04	Middle Initial or Name	C	ST			This is the middle initial or name of the ordering provider.
16.05	Suffix	C	ST			
16.06	Prefix	C	ST			
16.07	Degree	C	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
16.08	Source Table	C	ST			
16.09	Assigning Authority	C	HD			This is the NPI.
16.09.01	Namespace ID	C	IS			
16.09.02	Universal ID	C	ST			
16.09.03	Universal ID Type	C	ID			
16.10	Name Type Code	C	ID			
16.11	Identifier Check Digit	C	ST			
16.12	Code Identifying the Check Digit Scheme Employed	C	ID			
16.13	Identifier Type Code	C	IS			
16.14	Assigning Facility	C	HD			
16.14.01	Namespace ID	C	IS			
16.14.02	Universal ID	C	ST			
16.14.03	Universal ID Type	C	ID			
OBR.17	Order Callback Phone Number	X				
OBR.18	Placer Field 1	O	ST	2000	N	<p>If present, the Quantum Hub stores this information and returns it (as received) with the associated results.</p> <p>For each unique occurrence of OBR.04, the OBR.04 value is preserved along with the corresponding set of OBR.18 and OBR.19 values that are received in the order message.</p> <p>For more information, see “Store and forward” on page 105.</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.19	Placer Field 2	0	ST	2000	N	<p>If present, the Quantum Hub stores this information and returns it (as received) with the associated results.</p> <p>For each unique occurrence of OBR.04, the OBR.04 value is preserved along with the corresponding set of OBR.18 and OBR.19 values that are received in the order message.</p> <p>For more information, see “Store and forward” on page 105.</p>
OBR.20	Filler Field 1	X				
OBR.21	Filler Field 2	X				
OBR.22	Results Rpt/Status Chng - Date/Time	X				
OBR.23	Charge to Practice	X				
OBR.24	Diagnostic Serv Sect ID	X				
OBR.25	Result Status	X				
OBR.26	Parent Result	0	CM	400	N	
26.01	OBX3 Observation Identifier of Parent Result	0	CE			
26.02	OBX4 Sub ID of Parent Result	0	ST			
26.03	OBX5 Observation Results from Parent	0	TX			
OBR.27	Quantity/Timing	0	TQ	200	Y	
27.01	Quantity	0	CQ			
27.01.01	Quantity	0	NM			
27.01.02	Units	0	CE			
27.02	Interval	0	RI			

Field	Name	Req'd	Type	Length	Repeat	Comments
27.02.01	Repeat Pattern	0	IS			
27.02.02	Explicit Time Interval	0	ST			
27.03	Duration	0	ST			
27.04	Start Date Time	0	TS			
27.05	End Date Time	0	TS			
27.06	Priority	0	ST			The valid value for this field is: R (Routine).
27.07	Condition	0	ST			
27.08	Text	0	TX			
27.09	Conjunction	0	ID			
27.10	Order Sequencing	0	OSD			
27.10.01	Sequence or Results Flag	0	ID			
27.10.02	PON Entity Identifier	0	ST			
27.10.03	PON Namespace ID	0	IS			
27.10.04	FON Entity Identifier	0	ST			
27.10.05	FON Namespace ID	0	IS			
27.10.06	Sequence Condition Value	0	ST			
27.10.07	Maximum Num of Repeats	0	NM			
27.10.08	PON Universal ID	0	ST			
27.10.09	PON Universal ID Type	0	ID			
27.10.10	FON Universal ID	0	ST			
27.10.11	FON Universal ID Type	0	ID			
27.11	Occurrence Duration	0	CE			

Field	Name	Req'd	Type	Length	Repeat	Comments
27.11.01	Identifier	0	ST			
27.11.02	Text	0	ST			
27.11.03	Name of Coding System	0	ID			
27.11.04	Alternate Identifier	0	ST			
27.11.05	Alternate Text	0	ST			
27.11.06	Name of Alternate Coding System	0	ID			
27.12	Total Occurrences	0	NM			
OBR.28	Result Copies To	0	XCN	150	Y/5	
28.01	ID Number	0	ST			
28.02	Family Name	0	ST			
28.03	Given Name	0	ST			
28.04	Middle Initial or Name	0	ST			
28.05	Suffix	0	ST			
28.06	Prefix	0	ST			
28.07	Degree	0	IS			
28.08	Source Table	0	ST			
28.09	Assigning Authority	0	HD			
28.09.01	Namespace ID	0	IS			
28.09.02	Universal ID	0	ST			
28.09.03	Universal ID Type	0	ID			
28.10	Name Type Code	0	ID			
28.11	Identifier Check Digit	0	ST			
28.12	Code Identifying the Check Digit Scheme Employed	0	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
28.13	Identifier Type Code	0	IS			
28.14	Assigning Facility	0	HD			
28.14.01	Namespace ID	0	IS			
28.14.02	Universal ID	0	ST			
28.14.03	Universal ID Type	0	ID			
OBR.29	Parent	X				
OBR.30	Transportation Mode	X				
OBR.31	Reason for Study	X				
OBR.32	Principal Result Interpreter	X				
OBR.33	Assistant Result Interpreter	X				
OBR.34	Technician	X				
OBR.35	Transcriptionist	X				
OBR.36	Scheduled Date/Time	X				
OBR.37	Number of Sample Containers	X				
OBR.38	Transport Logistics of Collected Sample	X				
OBR.39	Collector's Comment	X				
OBR.40	Transport Arrangement Responsibility	X				
OBR.41	Transport Arranged	X				
OBR.42	Escort Required	X				
OBR.43	Planned Patient Transport Comment	X				

DG1—Diagnosis segment

The Diagnosis (DG1) segment contains patient diagnosis information.

Field	Name	Req'd	Type	Length	Repeat	Comments
DG1.00	Segment Type ID	R	ST	4	N	This field must be DG1.
DG1.01	Set ID	R	SI	4	N	This field allows identification of multiple diagnosis segments grouped beneath a single OBR segment and is usually a sequential number beginning with 1.
DG1.02	Diagnosis Coding Method	O	ID	3	N	This is the literal ICD version, such as ICD10.
DG1.03	Diagnosis Code	C	CE	60	N	This field contains the ICD-10 diagnosis code and diagnosis description, and is required if IN1.47 (Coverage Type) is T.
03.01	Identifier	O	ST			
03.02	Text	O	ST			
03.03	Name of Coding System	O	ID			
03.04	Alternate Identifier	O	ST			
03.05	Alternate Text	O	ST			
03.06	Name of Alternate Coding System	O	ID			
DG1.04	Diagnosis Description	O	ST	140	N	This is the diagnosis name and description.
DG1.05	Diagnosis Date/Time	X				
DG1.06	Diagnosis Type	X				
DG1.07	Major Diagnostic Category	X				
DG1.08	Diagnostic Related Group	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
DG1.09	DRG Approval Indicator	X				
DG1.10	DRG Grouper Review Code	X				
DG1.11	Outlier Type	X				
DG1.12	Outlier Days	X				
DG1.13	Outlier Cost	X				
DG1.14	Grouper Version and Type	X				
DG1.15	Diagnosis Priority	X				
DG1.16	Diagnosing Clinician	X				
DG1.17	Diagnosis Classification	X				
DG1.18	Confidential Indicator	X				
DG1.19	Attestation Date/Time	X				

OBX—Observation/Result segment

This segment is optional. AOE's in the order are typically captured as OBX segments.

Field	Name	Req'd	Type	Length	Repeat	Comments
OBX.00	Segment Type ID	R	ST	10	N	This field must be OBX.
OBX.01	Set ID	R	SI	10	N	This is the sequence number for OBX segments grouped beneath the same OBR segment.
OBX.02	Value Type	R	ID	2	N	This defines the structure of the <i>Observation Value (OBX.05)</i> . Valid values for this field are: <ul style="list-style-type: none"> • ST: String data • NM: Numeric data • CE: Coding elements • TX: Text data

Field	Name	Req'd	Type	Length	Repeat	Comments
OBX.03	Observation Identifier	R	CE	590	N	This field contains a value that reports the results for an AOE.
03.01	Identifier	O	ST			
03.02	Text	O	ST			
03.03	Name of Coding System	O	ID			
03.04	Alternate Identifier	R	ST			This is the <code>local_code</code> .
03.05	Alternate Text	R	ST			This is the <code>description</code> .
03.06	Name of Alternate Coding System	O	ID			
OBX.04	Observation Sub-ID	X				
OBX.05	Observation Value	R	*	500	Y	This field contains an answer to an AOE question. The asterisk (*) indicates that the data type is dependent on the selection in OBX.02 .
OBX.06	Units	X				
OBX.07	References Range	X				
OBX.08	Abnormal Flags	X				
OBX.09	Probability	X				
OBX.10	Nature of Abnormal Test	X				
OBX.11	Observ Result Status	X				
OBX.12	Date Last Obs Normal Values	X				
OBX.13	User Defined Access Checks	X				
OBX.14	Date/Time of the Observation	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBX.15	Producer's ID	X				
OBX.16	Responsible Observer	X				
OBX.17	Observation Method	X				

NTE—Notes and Comments segment

The Notes and Comments (NTE) segment contains notes and comments for ORM messages and is optional.

Field	Name	Req'd	Type	Length	Repeat	Comments
NTE.00	Segment Type ID	R	ST	4	N	This field must be NTE.
NTE.01	Set ID	R	SI	4	N	This field may be used to group multiple NTE segments in a message.

Field	Name	Req'd	Type	Length	Repeat	Comments
NTE.02	Source of Comment	0	ID	1	N	<p>Valid values for this field are:</p> <ul style="list-style-type: none"> • I: Internal comments. A value of I identifies the data in NTE.03 as internal comments that are not returned with the result. For normal orders, the limit is 5 lines of 60 characters each. For PSC Hold orders, only the first 60 characters are read • R: Report comments. A value of R identifies the data in NTE.03 as report comments that will be returned with the result. For normal orders, the limit is 5 lines of 60 characters each. For PSC Hold orders, only the first 60 characters are read • L: The ancillary (filler) department is the source of the comment • P: The orderer (placer) is the source of the comment • O: Another system is the source of the comment
NTE.03	Comment	R	ST	60	N	<p>Comments can use the following escape sequences to represent the reserved characters:</p> <ul style="list-style-type: none"> • \F\ field separator: • \S\ component separator: ^ • \T\ subcomponent separator: & • \R\ repetition separator: ~ • \E\ escape character: \ <p>Comments can also use the following embedded hexadecimal control characters to represent a line terminator:</p> <ul style="list-style-type: none"> • \X0A\ or \x0a\: CR (carriage return) • \X0D\ or \x0d\: LF (line feed)

Field	Name	Req'd	Type	Length	Repeat	Comments
						<p>The hexadecimal characters are not case-sensitive. They can be submitted individually and as a pair (\X0D\X0A\), but no other hexadecimal representation (for example, 2AF3) will be accepted.</p> <p>To represent new lines in the NTE segment, do 1 of the following:</p> <ul style="list-style-type: none"> • Use the hexadecimal CR and LF characters • Put each new line in a unique NTE segment <p>See the examples following this table.</p>

Comment examples

Example with new lines using hexadecimal control characters:

```
NTE|1|I|FAX TO:DR. FIRSTNAME LASTNAME FAX #513-111-2222\X0D\X0A\
NTE|2|I|1234 MAIN STREET #300\X0D\X0A\MASON, OH 45010
```

Example with new lines using unique NTE segments:

```
NTE|1|I|FAX TO:DR. FIRSTNAME LASTNAME FAX #513-111-2222
NTE|2|I|1234 MAIN STREET #300
NTE|3|I|MASON, OH 45010
```

In printed form, the information for both of these examples would appear as follows:

```
FAX TO:DR. FIRSTNAME LASTNAME FAX #513-111-2222
1234 MAIN STREET #300
MASON, OH 45010
```

Sample order HL7 2.3 messages

The following are sample ORM messages, formatted according to the “Order HL7 2.3 message format requirements” on page 103 and “Order HL7 2.3 message segment specifications” on page 108.

Sample order message

The following sample order message shows a PID segment with an NTE segment (for an internal comment that will **not** appear on the final report), primary and secondary insurance segments, and 2 OBR segments (one with NTE segments for associated report comments). In addition, the OBX segments associated with the second OBR segment contains multiple AOE's.

```
MSH|^~\&|HUBWS|46355||DAL|202412091132||ORM^O01|MZ54932|P|2.3|
PID|1|999-99-9999|CHART^^^CID~MEDICAL^^^MRN||PTLASTNAME^PTFIRSTNAME^||19750825|F|||
4690 MAIN STREET^^MASON^OH^45040||^513^5550124|||999654321||
NTE|1|I|PID associated internal comment line one|
IN1|1||UHMTH|United Health Care|PO Box
20400^^Mason^OH^45040||12345678|||PTLASTNAME^
PTFIRSTNAME|1||4771 Regent
Blvd^^Irving^TX^75063|||00000000|||T|
IN1|2||BLUE SHIELD|PO BOX 1212^^MASON^OH^35202||12345678|||SPOUSELASTNAME^
SPOUSEFIRSTNAME^MIDDLE|2|||X123456789|||T|
GT1|1||GTLASTNAME^GTFIRSTNAME||4690 Main Blvd^^Mason^OH^45040|||
ORC|NW|113288|||1122334455^DRLASTNAME^DRFIRSTNAME^M.^^^^NPI
OBR|1|113288||^287^BILIRUBIN, TOTAL||202412091100|||1122334455^DRLASTNAME^
DRFIRSTNAME^M.^^^^NPI|||^R
DG1|1|ICD|N35021|Urethral stricture due to childbirth
DG1|2|ICD|O1200|Gestational edema, unspecified trimester
DG1|3|ICD|Z3400|Encntr for suprvsn of normal first pregnancy, unsp trimester
DG1|4|ICD|O161|Unspecified maternal hypertension, first trimester
DG1|5|ICD|R5081|Fever presenting with conditions classified elsewhere
DG1|6|ICD|O26811|Pregnancy related exhaustion and fatigue, first trimester
DG1|7|ICD|O24011|Pre-existing diabetes, type 1, in pregnancy, first trimester
DG1|8|ICD|O2201|Varicose veins of low extrm in pregnancy, first trimester
DG1|9|ICD|O23521|Salpingo-oophoritis in pregnancy, first trimester
DG1|10|ICD|O99011|Anemia complicating pregnancy, first trimester
DG1|11|ICD|O2250|Cerebral venous thrombosis in pregnancy, unsp trimester
DG1|12|ICD|O24414|Gestational diabetes in pregnancy, insulin controlled
ORC|NW|113288|||1122334455^DRLASTNAME^DRFIRSTNAME^M.^^^^NPI
OBR|1|113288||^30294^QUAD SCREEN||202412091100|||1122334455^DRLASTNAME^
DRFIRSTNAME^M.^^^^NPI|||^R
OBX|1||^55127400^WGT||157
OBX|2||^55127500^RACE||C
OBX|3||^55166500^EDD||09/25/2013
OBX|4||^55127600^DIAB||Y
OBX|5||^55127800^HIST NEUR||N
OBX|6||^55147718^EDDB||U
OBX|7||^55147719^HXDS||N
OBX|8||^55147720^DONOR||N
OBX|9||^55147723^DDOB||NG
OBX|10||^55147905^RPT SPEC||N
OBX|11||^55166200^RACE INFO||NG
```

OBX|12||^^^55166305^NUM FETUS||1
OBX|13||^^^55166400^FAM HIST||N

Sample PSC hold order message

The following order message shows a PSC Hold order, as designated by PSC in MSH.05. In addition, this sample message shows an insurance (IN1) segment for client billing, as designated by C in IN1.47. No guarantor (GT1) segment is included in the message because the GT1 segment is required only for third-party billing.

```
MSH|^~\&|HUBWS|46355|PSC|DAL|202407081132||ORM^O01|MZ54932|P|2.3|
PID|1|999-99-9999|CHART^^^CID~MEDICAL
^^^MRN|5513904|PTLASTNAME^PTFIRSTNAME^||19750825|F|||
10 PARKWAY DRIVE^^MASON^OH^45040||^716^5550174|||999654321||
IN1|1|||C
ORC|NW|12|||1234567890^DRLASTNAME^DRFIRSTNAME^M.^^^NPI|||
OBR|1|12||^483^GLUCOSE|||
20240708104500|||1234567890^DRLASTNAME^DRFIRSTNAME^M.^^^NPI|||
DG1|1|ICD|I25700|Atherosclerosis of CABG, unsp, w unstable angina pectoris
```

Chapter 7: Order HL7 2.3.1 specification

In this chapter:

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About the Order HL7 2.3.1 specification

This chapter provides detailed format specifications for lab orders that are submitted via the Quantum Hub to a Quest Diagnostics lab for processing. Orders must be formatted according to the HL7 2.3.1 specification, with any exceptions noted in this chapter. ORM^O01 (*General Order Message*) is the supported message for orders.

This chapter includes the following sections:

- **Order message format requirements.** For information on the message format requirements, see [“Order HL7 2.3.1 message format requirements” on the next page](#)
- **Order message segment specifications.** Each order message submitted to the Quantum Hub must contain a number of standard sections. For requirements on the standard segments of an order message, see [“Order HL7 2.3.1 message segment specifications” on page 164](#)
- **Sample Order messages.** For samples of the various order message types, see [“Sample order HL7 2.3.1 messages” on page 209](#)

Note: For a detailed specification of Quest Diagnostics or third-party lab results that are received by the Quantum Hub, see [Chapter 15, “Lab results HL7 2.3/2.3.1 specification” beginning on page 441](#) or [Chapter 16, “Lab results HL7 LRI 2.5.1 specification” beginning on page 485](#).

Order HL7 2.3.1 message format requirements

In addition to the field-level validation detailed in “Order HL7 2.3.1 message segment specifications” on page 164, each inbound ORM message is validated by the Quantum Hub to ensure compliance with the rules outlined in this section.

Message segment hierarchy

ORM messages must follow the message segment hierarchy, as specified below:

MSH	Message Header (<i>Required</i>)
[{NTE}]	Notes and Comments (<i>Optional</i>)
PID	Patient Identification (<i>Required</i>)
[{NTE}]	Notes and Comments (<i>Optional</i>)
[PV1]	Patient Visit Data (<i>Optional</i>)
[{IN1}]	Insurance Information (<i>Required</i>)
[GT1]	Guarantor (<i>Conditional</i>)
{	
ORC	Common Order (<i>Required</i>)
[{NTE}]	Notes and Comments (<i>Optional</i>)
OBR	Observation request (<i>Required</i>)
[{NTE}]	Notes and Comments (<i>Optional</i>)
[{DG1}]	Diagnosis (<i>Optional</i>)
[{OBX}]	Observation/Result (<i>Conditional</i>)
}	

In the hierarchy shown above, braces ({ }) indicate where multiple items are allowed, and brackets ([]) indicate items that are optional and/or conditional.

Message segment requirements

The following table classifies the various ORM message segments based on their requirement status of Required (R), Optional (O), or Conditional (C) as defined below:

- **Required.** The segment must be present in the ORM message. If it is not present, the message is rejected by the Quantum Hub
- **Optional.** The segment is not required. The ORM message is accepted by the Quantum Hub whether or not this segment is present. If the segment is present, the Quantum Hub validates the associated field requirements as noted in the *Comments/Conditions* column of the table below
- **Conditional.** The segment may or may not be required in the ORM message, depending on certain conditions. Conditions are stipulated in the *Comments/Conditions* column of the table below. If the segment is present, the Quantum Hub validates the associated field requirements

Note: This table is only meant to communicate segment requirements; that is, whether or not a segment in the ORM message must be present, and, if present, how many of these segments can occur. The requirements listed in the table are over and above the field requirements detailed in “[Order HL7 2.3.1 message segment specifications](#)” on page 164. For example, if an ORM passes the segment level rules detailed in the following table, the message can still fail the field-level rules for any of the existing segments.

Segment	Req'd	Comments/conditions
MSH: Message Header	R	The Quantum Hub verifies that this segment is present in the ORM message.
PID: Patient Identifier	R	The Quantum Hub verifies the following: <ul style="list-style-type: none"> This segment is present in the ORM message There is only 1 PID in the ORM message
PV1: Patient Visit Data	O	If present, the Quantum Hub passes the PV1 segments through.
IN1: Insurance	R	This segment is required for all bill types (<i>Client Bill</i> (C), <i>Patient Bill</i> (P), and <i>Third-Party Bill</i> (T)). The Quantum Hub verifies that no more than 2 IN1 segments exist in the ORM message. While 2 are accepted, the primary insurance information must be in the first IN1 segment, and the secondary insurance information in the second IN1 segment. The Quantum Hub passes through 2 IN1 segments, if 2 are received. If only 1 IN1 is received, only 1 IN1 is passed through.
GT1: Guarantor	C	The Quantum Hub verifies that this segment is present if required by the bill type designated by IN1.47 (<i>Coverage Type</i>), as outlined below: <ul style="list-style-type: none"> If IN1.47 = P (<i>Patient Bill</i>), the GT1 segment is optional If IN1.47 = C (<i>Client Bill</i>), the GT1 segment is optional If IN1.47 = T (<i>Third-Party Bill</i>), the GT1 segment is required If present, the Quantum Hub also verifies that there is only 1 GT1 segment in the ORM message.
ORC: Common Order	R	The Quantum Hub verifies the following: <ul style="list-style-type: none"> This segment is present in the ORM message For each ORC segment, there is one—and only one—OBR segment in the ORM message ORC and OBR segments should be paired as follows: <pre> MSH PID ORC OBR 1 ORC OBR 1 ORC </pre>

Segment	Req'd	Comments/conditions
		OBR 1
OBR: Observation Request	R	<p>The Quantum Hub verifies the following:</p> <ul style="list-style-type: none"> • This segment is present in the ORM message • Each OBR segment is paired with an ORC segment • Only 1 OBR is associated with an ORC segment <p>Note: The Quantum Hub does not check the content of the OBR to verify if the Order Codes are duplicated in the ORM message.</p>
DG1: Diagnosis	O	<p>A maximum of 12 unique ICD-10 codes are permitted in an ORM message. Downstream clinical and administrative systems may not be able to successfully process the order if the content of this segment exceeds a total of 12 unique ICD-10 codes. Therefore, it is recommended that the sending system not exceed this limit.</p> <p>If present, the Quantum Hub verifies that all of the required data in this segment is present and in compliance with the format rules.</p> <p>Note: The Quantum Hub does not check the content of the fields, and does not perform business logic checks across multiple DG1 segments.</p>
OBX: Observation Result Detail	C	<p>AOEs associated with the order are captured as one-to-many OBX segments. If present, the Quantum Hub passes the segment through, if the data in the segment complies with the field-level rules detailed in “Order HL7 2.3.1 message segment specifications” on page 164.</p>
NTE: Notes and Comments	O	<p>If present, the rules for an ORM message include the following:</p> <ul style="list-style-type: none"> • Internal comments (NTE.02 is set to 1). Internal comments provide additional information helpful in proper testing or reporting. Internal comments will not appear on the report. For normal orders, only 5 NTE segments of 60 characters each (NTE.03 field width) are utilized by the lab. For PSC Hold orders, only the first 60 characters will be read • Report comments (NTE.02 is set to R). Report comments are sent to the laboratory to be placed on the report. For normal orders, only 2 NTE segments of 60 characters each (NTE.03 field width) are utilized by the lab. For PSC Hold orders, only the first 60 characters will be read <p>NTE segments can follow MSH, PID, ORC, and OBR segments in the order message.</p>

Store and forward

At the order code level, OBR.18 and OBR.19 are used as “store and forward” fields by the Quantum Hub. The Quantum Hub stores the data sent in these fields per order code, and verifies that the fields are blank when it passes them through.

At the test code level, the value for each unique occurrence of OBR.04 is preserved along with the corresponding set of OBR.18 and OBR.19 values. The Quantum Hub verifies that a value for OBR.04 is present (specifically, OBR.04.04 and OBR.04.05).

When results are returned, the Quantum Hub matches the result to the corresponding order message and inserts the OBR.18, OBR.19, and OBR.04 data into the result.

Order-result matching

Results are matched to orders as follows:

- The Quantum Hub compares the key fields of ORC.02, MSH.04, and MSH.06 in the ORU message to ORC.02, MSH.06, and MSH.04 in the ORM message. If there are multiple possible matches, PID.02 of the ORU message is compared to PID.03 of the ORM message to determine the correct match. Then, additional matching is done at the test code level using the following criteria:
 - **Criterion 1:** OBR.04.01 in the ORU message is matched to OBR.04.04 in the ORM message. If this match is successful, the store and forward fields are populated. Otherwise, Criterion 2 is evaluated
- Note:** If there are duplicate test codes (OBR.04.04) in the order, the Quantum Hub uses the first duplicated test code value for the order-result matching.
- **Criterion 2:** OBR.04.01 in the ORU message is matched to OBR.04.01 in the ORM message. If this match is successful, the store and forward fields are populated
 - If a result cannot be matched to an order using the method described above, the store and forward fields will not be populated in the outbound result file

If necessary, other store and forward fields can be defined. To define different or additional store and forward fields, consult with your project manager during the certification process.

Newline characters

Order HL7 messages must use the carriage return (CR) character (ASCII 0x0D) to indicate a segment delimiter. Order messages that contain a line feed (LF) character (ASCII 0x0A) or CRLF character (ASCII 0x0D0A) to indicate a segment delimiter will be rejected.

Field delimiters

A delimiter must separate each field. Even if a field contains no data, it must still be delimited. The delimiter for any given HL7 message is always defined in the MSH segment of the message, as the first character following the segment identifier (MSH.00). See the message segment descriptions for more detail. Standard HL7 delimiters are used.

Note: The standard HL7 delimiters (| ^ ~ \ &) are not accepted as valid data in any field, except MSH.02.

Field specifications

The following table describes the parameters used to define the data fields within each message segment.

Parameter	Description
Required	<p>The fields within each segment are classified based on their requirement status of Required (R), Optional (O), Conditional (C), or Not Supported (X) as defined below:</p> <ul style="list-style-type: none">• Required. If the corresponding segment is present, the field must also be present within the segment, and the Quantum Hub validates it against any stated requirements. If the field is not present, the message is rejected by the Quantum Hub• Optional. The field is not required; the segment is accepted by the Quantum Hub whether or not this field is present. If the field is present, the Quantum Hub validates it against any stated requirements. (The contents of this field will not be reflected in the lab result)• Conditional. The field may or may not be required, depending on certain conditions (stipulated in the <i>Comments</i> column of each segment table). If the stated conditions are not met, the message is rejected by the Quantum Hub. If the field is present, the Quantum Hub validates it against any stated requirements. (The contents of this field may or may not be reflected in the lab result)• Not Supported. If a field is described as Not Supported (the corresponding fields appear in <i>gray text</i> in the table), the content of the field is not used by the lab
Type	An HL7 standard data type as defined in the <i>HL7 2.3 Specification</i> .
Length	The maximum allowed length for the field.
Repeat	<p>Each field is classified with 1 of the following values:</p> <ul style="list-style-type: none">• N: May not repeat• Y: May repeat any number of times• Y/n: May repeat up to <i>n</i> times

Order HL7 2.3.1 message segment specifications

This section provides detailed specifications for each segment of an HL7 order message. Message segments include the following:

- “MSH—Message header segment” below
- “PID—Patient Identifier segment” on page 167
- “PV1—Patient Visit Data segment” on page 174
- “IN1—Insurance segment” on page 177
- “GT1—Guarantor segment” on page 186
- “ORC—Common Order segment” on page 192
- “OBR—Observation Request segment” on page 197
- “DG1—Diagnosis segment” on page 203
- “OBX—Observation/Result segment” on page 205
- “NTE—Notes and Comments Segment” on page 207

Notes:

- Order message segments that are not supported are not included in this section; for detailed specifications of those segments, refer to the *HL7 Standard*
- If 1 or more of the unsupported segments are submitted, the order message will be accepted as long as it is formatted to the published *HL7 Standard*

MSH—Message header segment

The Message Header (MSH) segment defines the intent, source, destination, and some specifics of the syntax of a message.

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.00	Segment Type ID	R	ST	4	N	This is MSH.
MSH.01	Field Separator	R	ST	1	N	The separator between the message segment type ID (MSH) and the first data field (MSH.02), which defines the character to be used as a separator for the rest of the message. This is always a vertical bar ().
MSH.02	Encoding Characters	R	ST	4	N	The following characters may be used: <ul style="list-style-type: none">• ^ (component separator)• ~ (repetition separator)• \ (escape character)

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> • & (sub-component separator) <p>These values are recommended by HL7, and are the only values supported by the Quantum Hub.</p>
MSH.03	Sending Application	O	HD	180	N	The name of the sending application.
03.01	Namespace ID	O	IS			
03.02	Universal ID	O	ST			
03.03	Universal ID Type	O	ID			
MSH.04	Sending Facility	R	HD	180	N	The sending facility. This is the account number(s) defined for the placer.
04.01	Namespace ID	O	IS			
04.02	Universal ID	O	ST			
04.03	Universal ID Type	O	ID			
MSH.05	Receiving Application	R	HD	180	N	<p>The receiving application identifier.</p> <p>For PSC Hold orders, this field must be populated with PSC. Otherwise, the order is considered to be a basic lab order.</p>
05.01	Namespace ID	O	IS			
05.02	Universal ID	O	ST			
05.03	Universal ID Type	O	ID			
MSH.06	Receiving Facility	R	HD	180	N	The receiving facility. This is the three-letter ID of the facility that performs the test.
06.01	Namespace ID	O	IS			
06.02	Universal ID	O	ST			
06.03	Universal ID Type	O	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.07	Date/Time of Message	R	TS	26	N	The date and time that the sending system created the message, formatted as YYYYMMDDHHMMSS. Note: All date timestamps are set to Coordinated Universal Time (UTC).
MSH.08	Security	X				
MSH.09	Message Type	R	CM	7	N	The type of message being transmitted, and the event leading to the creation of the message. The valid value for this field is ORM^O01 (order messages).
09.01	Message Type	R	ID			This must be ORM.
09.02	Trigger Event	R	ID			This must be O01.
MSH.10	Message Control ID	R	ST	20	N	A number or other data that uniquely identifies the message in its transmission to the lab system. If not provided, the Quantum Hub populates this field with a unique identifier (a date/time stamp followed by a 4-digit random number).
MSH.11	Processing ID	R	PT	3	N	This indicates whether this message is intended to be processed as a production, test, or debug message. The Quantum Hub verifies that the value in this field is 1 of the following: <ul style="list-style-type: none"> • P: Production • T: Training • D: Debug (Development)
11.01	Processing ID	R	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
11.02	Processing Mode	O	ID			
MSH.12	Version ID	R	VID	60	N	The value for this field is 2.3.1.
12.01	Version ID	R	ID			The value for this field is 2.3.1.
12.02	Internationalization Code	O	CE			
12.03	Internationalization Version ID	O	CE			
MSH.13	Sequence Number	X				
MSH.14	Continuation Pointer	X				
MSH.15	Accept Acknowledgment Type	X				
MSH.16	Application Acknowledgment Type	X				
MSH.17	Country Code	X				
MSH.18	Character Set	X				
MSH.19	Principal Language of Message	X				
MSH.20	Alternate Character Set Handling Scheme	X				

PID—Patient Identifier segment

The Patient Identifier (PID) segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.00	Segment Type ID	R	ST	4	N	This is PID.
PID.01	Set ID	O	SI	4	N	This field allows identification of multiple PID segments within a message, and is usually a sequential number beginning with 1.
PID.02	Patient ID (External ID)	O	CX	20	N	The placer's patient ID assigned to this order.

Field	Name	Req'd	Type	Length	Repeat	Comments
						The Quantum Hub also verifies that no reserved characters (^~\&) are present.
02.01	ID Number	O	ST			
02.02	Check Digit	O	ST			
02.03	Code Identifying the Check Digit Scheme Employed	O	ID			
02.04	Assigning Authority	O	HD			
02.04.01	Namespace ID	O	IS			
02.04.02	Universal ID	O	ST			
02.04.03	Universal ID Type	O	ID			
02.05	Identifier Type Code	O	ID			
02.06	Assigning Facility	O	HD			
02.06.01	Namespace ID	O	IS			
02.06.02	Universal ID	O	ST			
02.06.03	Universal ID Type	O	ID			
PID.03	Patient Identifier List	R	CX	250	Y	<p>PID.03 is a repeating field and is defined as a maximum length of 250 characters for each repeat of data. The placer's patient ID assigned to this order.</p> <p>The Quantum Hub verifies that no encoding characters are present. The Quantum Hub also verifies that no reserved characters (&~^\\) are present in the first subfield (03.01).</p>
03.01	ID Number	R	ST			This is the ID number defined by the <i>Assigning Authority</i> .
03.02	Check Digit	O	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.03	Code Identifying the Check Digit Scheme Employed	0	ID			
03.04	Assigning Authority	0	HD			<p>The valid values for <i>Assigning Authority</i> are:</p> <ul style="list-style-type: none"> • MRN: Medical Record Number • CID: Chart ID <p>If no Assigning Authority is present, the Quantum Hub assumes that the ID Number is a patient ID.</p>
03.04.01	Namespace ID	0	IS			
03.04.02	Universal ID	0	ST			
03.04.03	Universal ID Type	0	ID			
03.05	Identifier Type Code	0	ID			
03.06	Assigning Facility	0	HD			
03.06.01	Namespace ID	0	IS			
03.06.02	Universal ID	0	ST			
03.06.03	Universal ID Type	0	ID			
PID.04	Alternate Patient ID	X				
PID.05	Patient Name	R	XPN	48	Y	<p>This field must adhere to the following:</p> <ul style="list-style-type: none"> • No reserved characters (~\&) are allowed (verified by the Quantum Hub) • A numeric value cannot be used as the first character of the last name • There must be at least 1 character for first and last name

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> The entire patient name (excluding the delimiter) cannot exceed 24 characters, with the following constraints for the subfields: <ul style="list-style-type: none"> The last name can be a maximum of 20 characters. Any last name longer than the allowed limit is truncated in the corresponding result message The first name is limited to the difference between the number of characters in the last name and 24. For example, if the last name is 14 characters, the first name is limited to 10 characters. Any first name longer than the allowed limit is truncated in the corresponding result message If the middle name is within the entire name limit of 24 characters, it is returned in the corresponding result message. Otherwise, if the limit is exceeded, a minimum of the first character of the middle initial is always returned in the result message <p>Note: These length limitations do not apply to requisitions and ABNs generated via the RESTful or SOAP-based Order Submission web services. Names appear on the requisitions and ABNs as they are submitted in the order message.</p>
05.01	Family Name	R	ST			
05.02	Given Name	R	ST			
05.03	Middle Initial or Name	O	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
05.04	Suffix	0	ST			
05.05	Prefix	0	ST			
05.06	Degree	0	IS			
05.07	Name Type Code	0	ID			
05.08	Name Representation Code	0	ID			
PID.06	Mother's Maiden Name	X				
PID.07	Date/Time of Birth	R	TS	26	N	This field is the date of birth (DOB), formatted as: yyyymmddhhmm
PID.08	Sex	R	IS	1	N	The valid values for this field are: <ul style="list-style-type: none"> • M: Male • F: Female
PID.09	Patient Alias	X				
PID.10	Race	0	CE	80	Y	The patient's race. Valid values are: <ul style="list-style-type: none"> • A: Asian • B: Black or African American • I: American Indian or Alaskan Native • O: Other race • W: White • NG: Not given
PID.11	Patient Address	C	XAD	106	Y	The patient's address, formatted as: 1000 Parkway Drive^Apt. 4^ Mason^OH^45040^^^^^ This field is required if IN1.47 (<i>Coverage Type</i>) is P or T.
11.01	Street Address	C	ST			
11.02	Other Designation	C	ST			
11.03	City	C	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
11.04	State or Province	C	ST			
11.05	Zip or Postal Code	C	ST			
11.06	Country	C	ID			
11.07	Address Type	C	ID			
11.08	Other Geographic Designation	C	ST			
11.09	County or Parish Code	C	IS			
11.10	Census Tract	C	IS			
11.11	Address Representation Code	C	ID			
PID.12	County Code	X				
PID.13	Phone Number - Home	C	XTN	250	Y	<p>For backward compatibility, phone numbers sent in the 10-digit format (for example, 3148721727) or any of the following variations for sending data in the XTN data format will also be accepted:</p> <p> 3148727127^^^^^^^^ ^ or 3148727127^^^^^314^8727127^^ ^ or ^^^^^314^8727127^^ ^ or 3148727127 </p> <p>This field is required if IN1.47 (Coverage Type) is P or T.</p>
13.01	Phone Number String	C	ST			
13.02	Tele-communication Use Code	C	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
13.03	Tele-communication Equipment Type	C	ID			
13.04	Email Address	C	ST			
13.05	Country Code	C	NM			
13.06	Area or City Code	C	NM			
13.07	Phone Number	C	NM			
13.08	Extension	C	NM			
13.09	Any Text	C	ST			
PID.14	Phone Number - Business	X				
PID.15	Primary Language	X				
PID.16	Marital Status	X				
PID.17	Religion	X				
PID.18	Patient Account Number	X				
PID.19	SSN Number - Patient	X				
PID.20	Driver's Lic Num - Patient	X				
PID.21	Mother's Identifier	X				
PID.22	Ethnic Group	O	CE	80	Y	The patient's ethnicity. Valid values are: <ul style="list-style-type: none"> • H: Hispanic • NH: Not Hispanic • UN: Unknown • NG: Not given
PID.23	Birth Place	X				
PID.24	Multiple Birth Indicator	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.25	Birth Order	X				
PID.26	Citizenship	X				
PID.27	Veterans Military Status	X				
PID.28	Nationality	X				
PID.29	Patient Death Date & Time	X				
PID.30	Patient Death Indicator	X				

PV1—Patient Visit Data segment

The Patient Visit Data (PV1) segment is used by registration/patient administration applications to communicate information on a visit-specific basis. This segment can be used to send multiple-visit statistic records to the same patient account, or single-visit records to more than one account.

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.00	Segment Type ID	R	ST	4	N	This field is PV1.
PV1.01	Set ID	O	SI	4	N	
PV1.02	Patient Class	X				
PV1.03	Assigned Patient Location	O	PL	80	N	The patient's current location (inpatient or outpatient).
03.01	Point of Care	O	IS			
03.02	Room	O	IS			
03.03	Bed	O	IS			
03.04	Facility	O	HD			
03.04.01	Namespace ID	O	IS			
03.04.02	Universal ID	O	ST			
03.04.03	Universal ID Type	O	ID			
03.05	Location Status	O	IS			
03.06	Patient Location Type	O	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.07	Building	0	IS			
03.08	Floor	0	IS			
03.09	Location Description	0	ST			
PV1.04	Admission Type	X				
PV1.05	Preadmit Number	X				
PV1.06	Prior Patient Location	X				
PV1.07	Attending Doctor	X				
PV1.08	Referring Doctor	X				
PV1.09	Consulting Doctor	X				
PV1.10	Hospital Service	X				
PV1.11	Temporary Location	X				
PV1.12	Preadmit Test Indicator	X				
PV1.13	Readmission Indicator	X				
PV1.14	Admit Source	X				
PV1.15	Ambulatory Status	X				
PV1.16	VIP Indicator	X				
PV1.17	Admitting Doctor	X				
PV1.18	Patient Type	X				
PV1.19	Visit Number	X				
PV1.20	Financial Class	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.21	Charge Price Indicator	X				
PV1.22	Courtesy Code	X				
PV1.23	Credit Rating	X				
PV1.24	Contract Code	X				
PV1.25	Contract Effective Date	X				
PV1.26	Contract Amount	X				
PV1.27	Contract Period	X				
PV1.28	Interest Code	X				
PV1.29	Transfer to Bad Debt Code	X				
PV1.30	Transfer to Bad Debt Date	X				
PV1.31	Bad Debt Agency Code	X				
PV1.32	Bad Debt Transfer Amount	X				
PV1.33	Bad Debt Recovery Amount	X				
PV1.34	Delete Account Indicator	X				
PV1.35	Delete Account Date	X				
PV1.36	Discharge Disposition	X				
PV1.37	Discharged to Location	X				
PV1.38	Diet Type	X				
PV1.39	Servicing Facility	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.40	Bed Status	X				
PV1.41	Account Status	X				
PV1.42	Pending Location	X				
PV1.43	Prior Temporary Location	X				
PV1.44	Admit Date/Time	O	TS	26	N	This is the hospital admission date, formatted as: yyyymmdd
PV1.45	Discharge Date/Time	X				
PV1.46	Current Patient Balance	X				
PV1.47	Total Charges	X				
PV1.48	Total Adjustments	X				
PV1.49	Total Payments	X				
PV1.50	Alternate Visit ID	X				
PV1.51	Visit Indicator	X				
PV1.52	Other Healthcare Provider	X				

IN1—Insurance segment

The Insurance (IN1) segment contains insurance policy coverage information necessary to produce properly pro-rated and patient and insurance bills. This segment is applicable only to the inbound order for insurance billing. The Quantum Hub verifies that all data fields are in uppercase.

Field	Name	Req'd	Type	Length	Repeat	Comments
IN1.00	Segment Type ID	R	ST	4	N	This field is IN1.
IN1.01	Set ID	R	SI	4	N	IN1 message segments should be numbered sequentially from 1.
IN1.02	Insurance Plan ID	X				
IN1.03	Insurance Company ID	O	CX	59	Y	This is the QDI Bill mnemonic.
03.01	ID Number	O	ST			
03.02	Check Digit	O	ST			
03.03	Code Identifying the Check Digit Scheme Employed	O	ID			
03.04	Assigning Authority	O	HD			
03.04.01	Namespace ID	O	IS			
03.04.02	Universal ID	O	ST			
03.04.03	Universal ID Type	O	ID			
03.05	Identifier Type Code	O	ID			
03.06	Assigning Facility	O	HD			
03.06.01	Namespace ID	O	IS			
03.06.02	Universal ID	O	ST			
03.06.03	Universal ID Type	O	ID			
IN1.04	Insurance Company Name	C	XON	130	Y	This field is required if IN1.47 (Coverage Type) is T.
04.01	Organization Name	C	ST			
04.02	Organization Name Type Code	C	IS			
04.03	ID Number	C	NM			
04.04	Check Digit	C	NM			

Field	Name	Req'd	Type	Length	Repeat	Comments
04.05	Code Identifying the Check Digit Scheme Employed	C	ID			
04.06	Assigning Authority	C	HD			
04.06.01	Namespace ID	C	IS			
04.06.02	Universal ID	C	ST			
04.06.03	Universal ID Type	C	ID			
04.07	Identifier Type Code	C	ID			
04.08	Assigning Facility ID	C	HD			
04.08.01	Namespace ID	C	IS			
04.08.02	Universal ID	C	ST			
04.08.03	Universal ID Type	C	ID			
04.09	Name Representation Code	C	ID			
IN1.05	Insurance Company Address	C	XAD	106	Y	This field is required if IN1.47 (Coverage Type) is T.
05.01	Street Address	C	ST			
05.02	Other Designation	C	ST			
05.03	City	C	ST			
05.04	State or Province	C	ST			
05.05	Zip or Postal Code	C	ST			
05.06	Country	C	ID			
05.07	Address Type	C	ID			
05.08	Other Geographic Designation	C	ST			
05.09	County or Parish Code	C	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
05.10	Census Tract	C	IS			
05.11	Address Representation Code	C	ID			
IN1.06	Insurance Co. Contact Person	X				
IN1.07	Insurance Co Phone Number	O	XTN	40	Y	
07.01	Phone Number String	O	ST			
07.02	Tele-communication Use Code	O	ID			
07.03	Tele-communication Equipment Type	O	ID			
07.04	Email Address	O	ST			
07.05	Country Code	O	NM			
07.06	Area or City Code	O	NM			
07.07	Phone Number	O	NM			
07.08	Extension	O	NM			
07.09	Any Text	O	ST			
IN1.08	Group Number	C	ST	12	N	This field is required if IN1.47 (Coverage Type) is T. The permitted characters are: A-Z and 1-0.
IN1.09	Group Name	X				
IN1.10	Insured's Group Emp ID	X				
IN1.11	Insured's Group Emp Name	O	XON		Y	
11.01	Organization Name	O	ST			
11.02	Organization Name Type Code	O	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
11.03	ID Number	0	NM			
11.04	Check Digit	0	NM			
11.05	Code Identifying the Check Digit Scheme Employed	0	ID			
11.06	Assigning Authority	0	HD			
11.06.01	Namespace ID	0	IS			
11.06.02	Universal ID	0	ST			
11.06.03	Universal ID Type	0	ID			
11.07	Identifier Type Code	0	ID			
11.08	Assigning Facility ID	0	HD			
IN1.12	Plan Effective Date	X				
IN1.13	Plan Expiration Date	X				
IN1.14	Authorization Information	X				
IN1.15	Plan Type	X				
IN1.16	Name Of Insured	C	XPN	48	Y	<p>This field is required if IN1.47 (Coverage Type) is \mathbb{T}. Entries must adhere to the following:</p> <ul style="list-style-type: none"> • A numeric value cannot be used as the first character of the last name • There must be at least 1 character for first and last name • The entire name (excluding the delimiter) cannot exceed 24 characters, with the following constraints for the subfields:

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> The last name can be a maximum of 20 characters. Any last name longer than the allowed limit is truncated in the result message The first name is limited to the difference between the number of characters in the last name and 24. For example, if the last name is 14 characters, the first name is limited to 10 characters. Any first name longer than the limit is truncated in the result message If the middle name is within the entire name limit of 24 characters, it is returned in the corresponding result message. Otherwise, if the limit is exceeded, a minimum of the first character of the middle initial is always returned in the result message
16.01	Family Name	R	ST			
16.02	Given Name	R	ST			
16.03	Middle Initial or Name	C	ST			
16.04	Suffix	C	ST			
16.05	Prefix	C	ST			
16.06	Degree	C	IS			
16.07	Name Type Code	C	ID			
16.08	Name Representation Code	C	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
IN1.17	Insured's Relationship To Patient	C	CE	80	N	This field is required if IN1.47 (Coverage Type) is T . Valid values for this field are: <ul style="list-style-type: none"> • 1: Self • 2: Spouse • 8: Dependent
1.17.01	Identifier	C	ST			
1.17.02	Text	C	ST			
1.17.03	Name of Coding System	C	ST			
1.17.04	Alternate Identifier	C	ST			
1.17.05	Alternate Text	C	ST			
1.17.06	Name of Alternate Coding System	C	ST			
IN1.18	Insured's Date Of Birth	X				
IN1.19	Insured's Address	C	XAD	106	Y	This field is required if IN1.47 (Coverage Type) is P or T .
19.01	Street Address	C	ST			
19.02	Other Designation	C	ST			
19.03	City	C	ST			
19.04	State or Province	C	ST			
19.05	Zip or Postal Code	C	ST			
19.06	Country	C	ID			
19.07	Address Type	C	ID			
19.08	Other Geographic Designation	C	ST			
19.09	County or Parish Code	C	IS			
19.10	Census Tract	C	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
19.11	Address Representation Code	C	ID			
IN1.20	Assignment Of Benefits	X				
IN1.21	Coordination Of Benefits	X				
IN1.22	Coord Of Ben. Priority	X				
IN1.23	Notice Of Admission Flag	X				
IN1.24	Notice Of Admission Date	X				
IN1.25	Report Of Eligibility Flag	X				
IN1.26	Report Of Eligibility Date	X				
IN1.27	Release Information Code	X				
IN1.28	Pre-Admit Cert (PAC)	X				
IN1.29	Verification Date/Time	X				
IN1.30	Verification By	X				
IN1.31	Type Of Agreement Code	X				
IN1.32	Billing Status	X				
IN1.33	Lifetime Reserve Days	X				
IN1.34	Delay Before L.R. Day	X				
IN1.35	Company Plan Code	O	IS	8	N	This field further identifies an insurance plan.
IN1.36	Policy Number	C	ST	20	N	This is the individual policy number of the insured, and is required for Medicare submissions.

Field	Name	Req'd	Type	Length	Repeat	Comments
						This field is required if IN1.47 (Coverage Type) is T.
IN1.37	Policy Deductible	X				
IN1.38	Policy Limit - Amount	X				
IN1.39	Policy Limit - Days	X				
IN1.40	Room Rate - Semi-Private	X				
IN1.41	Room Rate - Private	X				
IN1.42	Insured's Employment Status	X				
IN1.43	Insured's Sex	X				
IN1.44	Insured's Employer Address	X				
IN1.45	Verification Status	X				
IN1.46	Prior Insurance Plan ID	X				
IN1.47	Coverage Type	C	IS	3	N	<p>Valid values for this field are:</p> <ul style="list-style-type: none"> T: Third-party bill P: Patient bill C: Client bill <p>Note: If IN1.47 = T, the GT1 segment is required.</p> <p>Rules for requirement of the IN1/GT1 segment are addressed in “Order HL7 2.3.1 message format requirements” on page 158.</p>
IN1.48	Handicap	X				
IN1.49	Insured's ID Number	X				

GT1—Guarantor segment

The Guarantor (GT1) segment contains guarantor (for example, the person or the organization with financial responsibility for payment of a patient account) data for patient and insurance billing applications. This segment is applicable only to the inbound order for patient and insurance billing. The Quantum Hub verifies that all data fields are in uppercase.

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.00	Segment Type ID	R	ST	4	N	This field is GT1.
GT1.01	Set ID	R	SI	4	N	GT1 message segments should be numbered sequentially from 1.
GT1.02	Guarantor Number	X				
GT1.03	Guarantor Name	C	XPN	48	Y	<p>This field is required if IN1.47 (<i>Coverage Type</i>) is P or T, and it must adhere to the following rules:</p> <ul style="list-style-type: none"> • No reserved characters (~\&) are allowed (verified by the Quantum Hub) • A numeric value cannot be used as the first character of the last name • There must be at least 1 character for first and last name • The entire name (excluding the delimiter) cannot exceed 24 characters, with the following constraints for the subfields: <ul style="list-style-type: none"> • The last name can be a maximum of 20 characters. Any last name longer than the allowed limit is truncated in the corresponding result message • The first name is limited to the difference between the number of characters in the last name and 24. For example, if the last name is 14 characters, the first name is limited to 10 characters. Any first name longer than the allowed limit is truncated in the corresponding result message

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> If the middle name is within the entire name limit of 24 characters, it is returned in the corresponding result message. Otherwise, if the limit is exceeded, a minimum of the first character of the middle initial is always returned in the result message <p>Note: These length limitations do not apply to requisitions and ABNs generated via the RESTful and SOAP-based Order Submission web services. Names appear on the requisitions and ABNs as they are submitted in the order message.</p>
03.01	Family Name	C	ST			
03.02	Given Name	C	ST			
03.03	Middle Initial or Name	C	ST			
03.04	Suffix	C	ST			
03.05	Prefix	C	ST			
03.06	Degree	C	IS			
03.07	Name Type Code	C	ID			
03.08	Name Representation Code	C	ID			
GT1.04	Guarantor Spouse Name	X				
GT1.05	Guarantor Address	C	XAD	106	Y	This field is required if IN1.47 (Coverage Type) is P or T.
05.01	Street Address	C	ST			
05.02	Other Designation	C	ST			
05.03	City	C	ST			
05.04	State or Province	C	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
05.05	Zip or Postal Code	C	ST			
05.06	Country	C	ID			
05.07	Address Type	C	ID			
05.08	Other Geographic Designation	C	ST			
05.09	County or Parish Code	C	IS			
05.10	Census Tract	C	IS			
05.11	Address Representation Code	C	ID			
GT1.06	Guarantor Phone Number - Home	C	XTN	250	Y	<p>This field is required if IN1.47 (<i>Coverage Type</i>) is P or T. For backward compatibility, phone numbers sent in the 10-number format (for example, 3148721727) or any of the following variations for sending data in the XTN data format will also be accepted:</p> <p> 3148727127^^^^^^^^ ^ or 3148727127^^^^^314^8727127^^ ^ or ^^^^^314^8727127^^ ^ or 3148727127 ^</p>
06.01	Phone Number String	C	ST			
06.02	Tele-communication Use Code	C	ID			
06.03	Tele-communication Equipment Type	C	ID			
06.04	Email Address	C	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
06.05	Country Code	C	NM			
06.06	Area or City Code	C	NM			
06.07	Phone Number	C	NM			
06.08	Extension	C	NM			
06.09	Any Text	C	ST			
GT1.07	Guarantor Phone Number - Business	X				
GT1.08	Guarantor Date/Time Of Birth	X				
GT1.09	Guarantor Sex	X				
GT1.10	Guarantor Type	X				
GT1.11	Guarantor Relationship	X				
GT1.12	Guarantor SSN	X				
GT1.13	Guarantor Date - Begin	X				
GT1.14	Guarantor Date - End	X				
GT1.15	Guarantor Priority	X				
GT1.16	Guarantor Employer Name	X				
GT1.17	Guarantor Employer Address	X				
GT1.18	Guarantor Employer Phone Number	X				
GT1.19	Guarantor Employee ID Number	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.20	Guarantor Employment Status	X				
GT1.21	Guarantor Organization Name	X				
GT1.22	Guarantor Billing Hold Flag	X				
GT1.23	Guarantor Credit Rating Code	X				
GT1.24	Guarantor Death Date And Time	X				
GT1.25	Guarantor Death Flag	X				
GT1.26	Guarantor Charge Adjustment Code	X				
GT1.27	Guarantor Household Annual Income	X				
GT1.28	Guarantor Household Size	X				
GT1.29	Guarantor Employer ID Number	X				
GT1.30	Guarantor Marital Status Code	X				
GT1.31	Guarantor Hire Effective Date	X				
GT1.32	Employment Stop Date	X				
GT1.33	Living Dependency	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.34	Ambulatory Status	X				
GT1.35	Citizenship	X				
GT1.36	Primary Language	X				
GT1.37	Living Arrangement	X				
GT1.38	Publicity Indicator	X				
GT1.39	Protection Indicator	X				
GT1.40	Student Indicator	X				
GT1.41	Religion	X				
GT1.42	Mother's Maiden Name	X				
GT1.43	Nationality	X				
GT1.44	Ethnic Group	X				
GT1.45	Contact Person's Name	X				
GT1.46	Contact Person's Telephone Number	X				
GT1.47	Contact Reason	X				
GT1.48	Contact Relationship	X				
GT1.49	Contact Job Title	X				
GT1.50	Job Code/Class	X				
GT1.51	Guarantor Employer's Organization Name	X				
GT1.52	Handicap	X				
GT1.53	Job Status	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.54	Guarantor Financial Class	X				
GT1.55	Guarantor Race	X				

ORC—Common Order segment

The Common Order (ORC) segment is used to transmit fields that are common to all orders (all types of services that are requested). The ORC segment is required in the ORM message.

Field	Name	Req'd	Type	Length	Repeat	Comments
ORC.00	Segment Type ID	R	ST	4	N	This field is ORC.
ORC.01	Order Control	R	ID	2	N	This field accepts any order control code listed in the ORC.01 order control codes table (<i>HL7 table 0119—Order control</i>).
ORC.02	Placer Order Number	R	EI	22	N	<p>The placer application's order number.</p> <p>The Quantum Hub verifies the following:</p> <ul style="list-style-type: none"> • This field is present • The value in ORC 02.01 (<i>Entity Identifier</i>) is the same as the value in OBR 02.01 (<i>Entity Identifier</i>) • All values for this field in all ORC and OBR segments are identical <p>Otherwise, the order will be rejected.</p> <p>Note: The Quantum Hub does not require unique order numbers. The service provider is responsible for handling any duplicate order numbers that are received.</p>
02.01	Entity Identifier	R	ST			This must match OBR 02.01 (<i>Entity Identifier</i>) or the order will be rejected.
02.02	Namespace ID	O	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
02.03	Universal ID	0	ST			
02.04	Universal ID Type	0	ID			
ORC.03	Filler Order Number	X				
ORC.04	Placer Group Number	X				
ORC.05	Order Status	X				
ORC.06	Response Flag	X				
ORC.07	Quantity/Timing	X				
ORC.08	Parent	X				
ORC.09	Date/Time of Transaction	X				
ORC.10	Entered By	X				
ORC.11	Verified By	0	XCN	250	Y	This identifies the non-physician provider (NPP) who verified the accuracy of the entered request, formatted as: NPP_ID^NPP_Name
11.01	ID Number	0	ST			This is the NPP_ID.
11.02	Family Name	0	ST			This is the NPP_Name.
11.03	Given Name	0	ST			
11.04	Middle Initial or Name	0	ST			
11.05	Suffix	0	ST			
11.06	Prefix	0	ST			
11.07	Degree	0	IS			
11.08	Source Table	0	ST			
11.09	Assigning Authority	0	HD			
11.09.01	Namespace ID	0	IS			
11.09.02	Universal ID	0	ST			
11.09.03	Universal ID Type	0	ID			
11.10	Name Type Code	0	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
11.11	Identifier Check Digit	0	ST			
11.12	Code Identifying the Check Digit Scheme Employed	0	ID			
11.13	Identifier Type Code	0	IS			
11.14	Assigning Facility	0	HD			
11.14.01	Namespace ID	0	IS			
11.14.02	Universal ID	0	ST			
11.14.03	Universal ID Type	0	ID			
11.15	Name Representation Code	0	ID			
ORC.12	Ordering Provider	C	XCN	120	Y	This identifies the provider who ordered the test (same as OBR.16). This field is required if IN1.47 (Coverage Type) is P or T.
12.01	ID Number	C	ST			This is the NPI.
12.02	Family Name	C	ST			This is the ordering provider's last name.
12.03	Given Name	C	ST			This is the ordering provider's first name.
12.04	Middle Initial or Name	C	ST			This is the ordering provider's middle name or initial.
12.05	Suffix	C	ST			
12.06	Prefix	C	ST			
12.07	Degree	C	IS			
12.08	Source Table	C	ST			
12.09	Assigning Authority	C	HD			This is the NPI.
12.09.01	Namespace ID	C	IS			
12.09.02	Universal ID	C	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
12.09.03	Universal ID Type	C	ID			
12.10	Name Type Code	C	ID			
12.11	Identifier Check Digit	C	ST			
12.12	Code Identifying the Check Digit Scheme Employed	C	ID			
12.13	Identifier Type Code	C	IS			
12.14	Assigning Facility	C	HD			
12.14.01	Namespace ID	C	IS			
12.14.02	Universal ID	C	ST			
12.14.03	Universal ID Type	C	ID			
12.15	Name Representation Code	C	ID			
ORC.13	Enterer's Location	X				
ORC.14	Call Back Phone Number	X				
ORC.15	Order Effective Date/Time	X				
ORC.16	Order Control Code Reason	X				
ORC.17	Entering Organization	X				
ORC.18	Entering Device	X				
ORC.19	Action By	X				
ORC.20	Advanced Beneficiary Notice Code	X				
ORC.21	Ordering Facility Name	X				
ORC.22	Ordering Facility Address	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
ORC.23	Ordering Facility Phone Number	X				
ORC.24	Ordering Provider Address	X				

OBR—Observation Request segment

One OBR segment must be transmitted for each Order Code associated with any PID segment. This segment is mandatory in ORM messages.

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.00	Segment Type ID	R	ST	4	N	This is OBR.
OBR.01	Set ID	O	SI	4	N	OBR segments are paired with an ORC segment.
OBR.02	Placer Order Number	R	EI	20	N	<p>The placer application's order number.</p> <p>The Quantum Hub verifies the following:</p> <ul style="list-style-type: none"> • This field is present • The value in 02.01 (Entity Identifier) is the same as the value in 02.01 (Entity Identifier) • All values for this field in all OBR and ORC segments are identical <p>Otherwise, the order will be rejected.</p> <p>Note: The Quantum Hub does not require unique order numbers. The service provider is responsible for handling any duplicate order numbers that are received.</p>
02.01	Entity Identifier	R	ST			This must match 02.01 (Entity Identifier) or the order will be rejected.
02.02	Namespace ID	O	IS			
02.03	Universal ID	O	ST			
02.04	Universal ID Type	O	ID			
OBR.03	Filler Order Number	X				
OBR.04	Universal Service ID	R	CE	200	N	This is the identification code for the ordered test. One order code per OBR segment is allowed, formatted as:

Field	Name	Req'd	Type	Length	Repeat	Comments
						^^^local_order_code^description Note: The incoming order data is preserved for subsequent inclusion in matching result messages. For more information, see “Store and forward” on page 160.
04.01	Identifier	O	ST			
04.02	Text	O	ST			
04.03	Name of Coding System	O	ID			
04.04	Alternate Identifier	R	ST			This is the local_order_code.
04.05	Alternate Text	O	ST			This is the description.
04.06	Name of Alternate Coding System	O	ID			
OBR.05	Priority (OBR.27)	X				
OBR.06	Requested Date/time	X				
OBR.07	Observation Date/Time	R	TS	26	N	This is the specimen collection date and time. This field is required if this is a PSC Hold order. This field is formatted as: yyyymmddhhmm Note: For PSC Hold orders, the client must be able to add a future collection date.
OBR.08	Observation End Date/Time	X				
OBR.09	Collection Volume	X				
OBR.10	Collector Identifier	X				
OBR.11	Specimen Action Code	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.12	Danger Code	X				
OBR.13	Relevant Clinical Info.	X				
OBR.14	Specimen Received Date/Time	X				
OBR.15	Specimen Source	X				
OBR.16	Ordering Provider	C	XCN	120	Y	This is the provider who ordered the test (same as ORC.12) and is required if IN1.47 (Coverage Type) is P or T.
16.01	ID Number	C	ST			This is the <code>NPI_number</code> .
16.02	Family Name	C	ST			This is the last name of the ordering provider.
16.03	Given Name	C	ST			This is the first name of the ordering provider.
16.04	Middle Initial or Name	C	ST			This is the middle initial or name of the ordering provider.
16.05	Suffix	C	ST			
16.06	Prefix	C	ST			
16.07	Degree	C	IS			
16.08	Source Table	C	ST			
16.09	Assigning Authority	C	HD			This is the <code>NPI</code> .
16.09.01	Namespace ID	C	IS			
16.09.02	Universal ID	C	ST			
16.09.03	Universal ID Type	C	ID			
16.10	Name Type Code	C	ID			
16.11	Identifier Check Digit	C	ST			
16.12	Code Identifying the Check Digit Scheme Employed	C	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
16.13	Identifier Type Code	C	IS			
16.14	Assigning Facility	C	HD			
16.14.01	Namespace ID	C	IS			
16.14.02	Universal ID	C	ST			
16.14.03	Universal ID Type	C	ID			
16.15	Name Representation Code	C	ID			
OBR.17	Order Callback Phone Number	X				
OBR.18	Placer Field 1	O	ST	2000	N	<p>If present, the Quantum Hub stores this information and returns it (as received) with the associated results.</p> <p>For each unique occurrence of OBR.04, the OBR.04 value is preserved along with the corresponding set of OBR.18 and OBR.19 values that are received in the order message. For more information, see “Store and forward” on page 160.</p>
OBR.19	Placer Field 2	O	ST	2000	N	<p>If present, the Quantum Hub stores this information and returns it (as received) with the associated results.</p> <p>For each unique occurrence of OBR.04, the OBR.04 value is preserved along with the corresponding set of OBR.18 and OBR.19 values that are received in the order message. For more information, see “Store and forward” on page 160.</p>
OBR.20	Filler Field 1	X				
OBR.21	Filler Field 2	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.22	Results Rpt/Status Chng - Date/Time	X				
OBR.23	Charge to Practice	X				
OBR.24	Diagnostic Serv Sect ID	X				
OBR.25	Result Status	X				
OBR.26	Parent Result	X				
OBR.27	Quantity/Timing	0	TQ	200	Y	
27.01	Quantity	0	CQ			
27.01.01	Quantity	0	NM			
27.01.02	Units	0	CE			
27.02	Interval	0	RI			
27.02.01	Repeat Pattern	0	IS			
27.02.02	Explicit Time Interval	0	ST			
27.03	Duration	0	ST			
27.04	Start Date Time	0	TS			
27.05	End Date Time	0	TS			
27.06	Priority	0	ST			The valid value for this field is: R (Routine).
27.07	Condition	0	ST			
27.08	Text	0	TX			
27.09	Conjunction	0	ID			
27.10	Order Sequencing	0	OSD			
27.10.01	Sequence or Results Flag	0	ID			
27.10.02	PON Entity Identifier	0	ST			
27.10.03	PON Namespace ID	0	IS			
27.10.04	FON Entity Identifier	0	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
27.10.05	FON Namespace ID	0	IS			
27.10.06	Sequence Condition Value	0	ST			
27.10.07	Maximum Num of Repeats	0	NM			
27.10.08	PON Universal ID	0	ST			
27.10.09	PON Universal ID Type	0	ID			
27.10.10	FON Universal ID	0	ST			
27.10.11	FON Universal ID Type	0	ID			
27.11	Occurrence Duration	0	CE			
27.11.01	Identifier	0	ST			
27.11.02	Text	0	ST			
27.11.03	Name of Coding System	0	ID			
27.11.04	Alternate Identifier	0	ST			
27.11.05	Alternate Text	0	ST			
27.11.06	Name of Alternate Coding System	0	ID			
27.12	Total Occurrences	0	NM			
OBR.28	Result Copies To	X				
OBR.29	Parent	X				
OBR.30	Transportation Mode	X				
OBR.31	Reason for Study	X				
OBR.32	Principal Result Interpreter	X				
OBR.33	Assistant Result Interpreter	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.34	Technician	X				
OBR.35	Transcriptionist	X				
OBR.36	Scheduled Date/Time	X				
OBR.37	Number of Sample Containers	X				
OBR.38	Transport Logistics of Collected Sample	X				
OBR.39	Collector's Comment	X				
OBR.40	Transport Arrangement Responsibility	X				
OBR.41	Transport Arranged	X				
OBR.42	Escort Required	X				
OBR.43	Planned Patient Transport Comment	X				
OBR.44	Procedure Code	X				
OBR.45	Procedure Code Modifier	X				

DG1—Diagnosis segment

The Diagnosis (DG1) segment contains patient diagnosis information.

Field	Name	Req'd	Type	Length	Repeat	Comments
DG1.00	Segment Type ID	R	ST	4	N	This field is DG1.
DG1.01	Set ID	R	SI	4	N	This field allows identification of multiple diagnosis segments grouped beneath a single OBR segment and is usually a sequential number beginning with 1.

Field	Name	Req'd	Type	Length	Repeat	Comments
DG1.02	Diagnosis Coding Method	O	ID	3	N	This is the literal ICD version, such as ICD9.
DG1.03	Diagnosis Code	C	CE	60	N	This field contains the ICD-10 diagnosis code and diagnosis description, and is required if IN1.47 (Coverage Type) is T.
03.01	Identifier	O	ST			
03.02	Text	O	ST			
03.03	Name of Coding System	O	ID			
03.04	Alternate Identifier	O	ST			
03.05	Alternate Text	O	ST			
03.06	Name of Alternate Coding System	O	ID			
DG1.04	Diagnosis Description	O	ST	140	N	This is the diagnosis name and description.
DG1.05	Diagnosis Date/Time	X				
DG1.06	Diagnosis Type	X				
DG1.07	Major Diagnostic Category	X				
DG1.08	Diagnostic Related Group	X				
DG1.09	DRG Approval Indicator	X				
DG1.10	DRG Grouper Review Code	X				
DG1.11	Outlier Type	X				
DG1.12	Outlier Days	X				
DG1.13	Outlier Cost	X				
DG1.14	Grouper Version and Type	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
DG1.15	Diagnosis Priority	X				
DG1.16	Diagnosing Clinician	X				
DG1.17	Diagnosis Classification	X				
DG1.18	Confidential Indicator	X				
DG1.19	Attestation Date/Time	X				

OBX—Observation/Result segment

This segment is optional. AOE's in the order are typically captured as OBX segments.

Field	Name	Req'd	Type	Length	Repeat	Comments
OBX.00	Segment Type ID	R	ST	10	N	This field is OBX.
OBX.01	Set ID	R	SI	10	N	This is the sequence number for OBX segments grouped beneath the same OBR segment.
OBX.02	Value Type	R	ID	3	N	This defines the structure of the <i>Observation Value</i> (OBX.05). Valid values for this field are: <ul style="list-style-type: none"> ST: String data NM: Numeric data CE: Coding elements TX: Text data
OBX.03	Observation Identifier	R	CE	590	N	This field contains a value that reports the results for an AOE.
03.01	Identifier	O	ST			
03.02	Text	O	ST			
03.03	Name of Coding System	O	ID			
03.04	Alternate Identifier	R	ST			This is the <code>local_code</code> .
03.05	Alternate Text	R	ST			This is the <code>description</code> .

Field	Name	Req'd	Type	Length	Repeat	Comments
03.06	Name of Alternate Coding System	O	ID			
OBX.04	Observation Sub-ID	X				
OBX.05	Observation Value	R	*	65536	Y/4	This field contains an answer to an AOE question. The asterisk (*) indicates that the data type is dependent on the selection in OBX.02 .
OBX.06	Units	X				
OBX.07	References Range	X				
OBX.08	Abnormal Flags	X				
OBX.09	Probability	X				
OBX.10	Nature of Abnormal Test	X				
OBX.11	Observ Result Status	X				
OBX.12	Date Last Obs Normal Values	X				
OBX.13	User Defined Access Checks	X				
OBX.14	Date/Time of the Observation	X				
OBX.15	Producer's ID	X				
OBX.16	Responsible Observer	X				
OBX.17	Observation Method	X				

NTE—Notes and Comments Segment

The Notes and Comments (NTE) segment contains notes and comments for ORM messages and is optional.

Field	Name	Req'd	Type	Length	Repeat	Comments
NTE.00	Segment Type ID	R	ST	4	N	This field is NTE.
NTE.01	Set ID	R	SI	4	N	This field may be used to group multiple NTE segments in a message.
NTE.02	Source of Comment	O	ID	1	N	Valid values for this field are: <ul style="list-style-type: none"> I: Internal comments. A value of I identifies the data in NTE.03 as internal comments that will not be returned with the result (For normal orders, limit is 5 lines of 60 characters each. For PSC Hold orders, only the first 60 characters will be read) R: Report comments. A value of R identifies the data in NTE.03 as report comments that will be returned with the result (For normal orders, limit is 2 lines of 60 characters each. For PSC Hold orders, only the first 60 characters will be read) L: The ancillary (filler) department is the source of the comment P = The orderer (placer) is the source of the comment O: Another system is the source of the comment
NTE.03	Comment	R	ST	60	Y	Comments can use the following escape sequences to represent the reserved characters: <ul style="list-style-type: none"> \F\ field separator: \S\ component separator: ^ \T\ subcomponent separator: & \R\ repetition separator: ~ \E\ escape character: \

Field	Name	Req'd	Type	Length	Repeat	Comments
						<p>Comments can also use the following embedded hexadecimal control characters to represent a line terminator:</p> <ul style="list-style-type: none"> • \X0A\ or \x0a\ : CR (carriage return) • \X0D\ or \x0d\ : LF (line feed) <p>The hexadecimal characters are not case-sensitive. They can be submitted individually and as a pair (\X0D\ \X0A\), but no other hexadecimal representation (for example, 2AF3) will be accepted.</p> <p>Otherwise, embedded control characters are not allowed and will cause the order to be rejected.</p> <p>To represent new lines in the NTE segment, do 1 of the following:</p> <ul style="list-style-type: none"> • Use the hexadecimal CR and LF characters • Put each new line in a unique NTE segment <p>See the examples following this table.</p>
NTE.04	Comment Type	X				

Comment examples

Example with new lines using hexadecimal control characters:

```
NTE|1|I|FAX TO:DR. FIRSTNAME LASTNAME FAX #513-111-2222\X0D\ \X0A\
NTE|2|I|1234 MAIN STREET #300\X0D\ \X0A\MASON, OH 45010
```

Example with new lines using unique NTE segments:

```
NTE|1|I|FAX TO:DR. FIRSTNAME LASTNAME FAX #513-111-2222
NTE|2|I|1234 MAIN STREET #300
NTE|3|I|MASON, OH 45010
```

In printed form, the information for both of these examples would appear as follows:

```
FAX TO:DR. FIRSTNAME LASTNAME FAX #513-111-2222
1234 MAIN STREET #300
MASON, OH 45010
```

Sample order HL7 2.3.1 messages

The following are sample ORM messages, formatted according to the “Order HL7 2.3.1 message format requirements” on page 158 and “Order HL7 2.3.1 message segment specifications” on page 164.

Sample order message

The following sample order message shows a PID segment with an NTE segment for an internal comment (that will **not** appear on the final report) and an NTE segment for a comment that will appear on the final report, and 1 of each of the remaining required segments—insurance (IN1), guarantor (GT1), common order (ORC), observation request (OBR), and diagnosis (DG1). The final observation result detail segments (OBX) contain AOE.

```
MSH|^~\&|HUBWS|46355||DAL|202412091132||ORM^O01|MZ54932|P|2.3.1|
PID|1||CHART^^^CID~MEDICAL^^^MRN||PTLASTNAME^PTFIRSTNAME^||19750825|F|||
4690 MAIN STREET^^MASON^OH^45040||^513^5550124|||999654321||
NTE|1|I|internal comment|
NTE|1|R|report comment|
IN1|1||UHMTH|United Health Care|PO Box
20400^^Mason^OH^45040||12345678|||PTLASTNAME^
PTFIRSTNAME|1||4690 MAIN
STREET^^MASON^OH^45040|||00000000|||T|
GT1|1||GTLASTNAME^GTFIRSTNAME||4690 Parkway Drive^^Mason^OH^45040|||
ORC|NW|54932-6|||1234567893^DRLASTNAME^DRFIRSTNAME^^^NPI|||
OBR|1|54932-6||^30294^Maternal Quad
Screen||20241209094434|||1234567893^DRLASTNAME^
DRFIRSTNAME^^^NPI|||
DG1|1|ICD|N35021|Urethral stricture due to childbirth
DG1|2|ICD|O1200|Gestational edema, unspecified trimester
DG1|3|ICD|Z3400|Encntr for suprvsn of normal first pregnancy, unsp trimester
DG1|4|ICD|O161|Unspecified maternal hypertension, first trimester
DG1|5|ICD|R5081|Fever presenting with conditions classified elsewhere
DG1|6|ICD|O26811|Pregnancy related exhaustion and fatigue, first trimester
DG1|7|ICD|O24011|Pre-existing diabetes, type 1, in pregnancy, first trimester
DG1|8|ICD|O2201|Varicose veins of low extrm in pregnancy, first trimester
DG1|9|ICD|O23521|Salpingo-oophoritis in pregnancy, first trimester
DG1|10|ICD|O99011|Anemia complicating pregnancy, first trimester
DG1|11|ICD|O2250|Cerebral venous thrombosis in pregnancy, unsp trimester
DG1|12|ICD|O24414|Gestational diabetes in pregnancy, insulin controlled
OBX|1||^55210420^EDD||08/21/1985
OBX|2||^55210440^GEST CALC||L
OBX|3||^55210460^WGT||157|
OBX|4||^55210480^RACE||C
```

Sample PSC Hold order message

The following sample order message shows a PSC Hold order, as designated by PSC in MSH.05. In addition, this sample message shows an insurance (IN1) segment for client billing, as designated by C in IN1.47. No guarantor (GT1) segment is included in the message because the GT1 segment is required only for third-party billing.

```
MSH|^~\&|HUBWS|46355|PSC|DAL|202412091132||ORM^O01|MZ54932|P|2.3.1|
PID|1||CHART^^^CID~MEDICAL ^^MRN||PTLASTNAME^PTFIRSTNAME^||19750825|F|||10 PARKWAY
DRIVE^^MASON^OH^45040||^716^5550174|||999654321||
IN1|1|||C
ORC|NW|12|||1234567893^DRLASTNAME^DRFIRSTNAME^M.^^^NPI|||
OBR|1|12||^483^GLUCOSE|||
20241209104500|||1234567893^DRLASTNAME^DRFIRSTNAME^M.^^^
NPI|||
DG1|1|ICD|I25700|Atherosclerosis of CABG, unsp, w unstable angina pectoris
```

Chapter 8: Order HL7 2.5.1 specification

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- Order HL7 2.5.1 message format requirements 213
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About the Order HL7 2.5.1 specification

This chapter provides detailed format specifications for lab orders that are submitted via the Quantum Hub to a Quest Diagnostics lab for processing. Orders must be formatted according to the HL7 2.5.1 specification, with any exceptions noted in this chapter. The supported messages for orders are OML^O21—Laboratory Order Message.

This chapter includes the following sections:

- **Order message format requirements.** For information on the message format requirements, see [“Order HL7 2.5.1 message format requirements” on the next page](#)
- **Order message segment specifications.** Each order message submitted to the Quantum Hub must contain a number of standard sections. For requirements on the standard segments of an order message, see [“Order HL7 2.5.1 message segment specifications” on page 218](#)
- **Sample Order messages.** For samples of the various order message types, see [“Sample order HL7 2.5.1 message” on page 279](#)

Note: For a detailed specification of Quest Diagnostics or third-party lab results that are received by the Quantum Hub, see [Chapter 15, “Lab results HL7 2.3/2.3.1 specification” beginning on page 441](#) or [Chapter 16, “Lab results HL7 LRI 2.5.1 specification” beginning on page 485](#).

Order HL7 2.5.1 message format requirements

In addition to the field-level validation detailed in “Order HL7 2.5.1 message segment specifications” on page 218, each inbound OML message is validated by the Quantum Hub to ensure compliance with the rules outlined in this section.

Message segment hierarchy

OML messages must follow the message segment hierarchy, as specified below:

MSH	Message Header (<i>Required</i>)
{ [NTE] }	Notes and Comments (for header) (<i>Optional</i>)
[— PATIENT begin
PID	Patient Identification (<i>Required</i>)
{ [NTE] }	Notes and Comments (<i>Optional</i>)
[— PATIENT_VISIT begin
PV1	Patient Visit (<i>Required</i>)
]	— PATIENT_VISIT end
[{	— INSURANCE begin
IN1	Insurance Information (<i>Required</i>)
}]	— INSURANCE end
[GT1]	Guarantor (<i>Conditional</i>)
]	— PATIENT end
{	— ORDER begin
ORC	Common Order (<i>Conditional</i> , only one per order)
[{NTE}]	Notes and Comments (for Results) (<i>Optional</i>)
[{	— TIMING begin
TQ1	Timing/Quantity (<i>Required</i> if common order is present, only one per order)
}]	— TIMING end
[— OBSERVATION_REQUEST begin
OBR	Observation Request (<i>Required</i> if common order is present)
[{NTE}]	Notes and comments (for Detail) (<i>Optional</i>)
[[DG1]]	Diagnosis (<i>Optional</i>)
[{	— OBSERVATION begin
OBX	Observation Result
[{NTE}]	Notes and Comments (for Results) (<i>Optional</i>)
}]	— OBSERVATION end
]	— OBSERVATION_REQUEST end
}	— ORDER end

In the hierarchy shown above, braces ({ }) indicate where multiple items are allowed, and brackets ([]) indicate items that are optional and/or conditional.

Message segment requirements

The following table classifies the various OML message segments based on their requirement status of Required (R), Optional (O), or Conditional (C) as defined below:

- **Required.** The segment must be present in the OML message. If it is not present, the message is rejected by the Quantum Hub

- **Optional.** The segment is **not** required. The OML message is accepted by the Quantum Hub whether or not this segment is present. If the segment is present, the Quantum Hub validates the associated field requirements
- **Conditional.** The segment may or may not be required, depending on certain conditions. Conditions are stipulated in the *Comments/Conditions* column of the table below. If the segment is present, the Quantum Hub validates the associated field requirements

Note: This table is only meant to communicate segment requirements; that is, whether or not a segment in the OML message must be present, and, if present, how many of these segments can occur. The requirements listed in the table are over and above the field requirements detailed in “[Order HL7 2.5.1 message segment specifications](#)” on page 218. For example, if an OML passes the segment-level rules detailed in the following table, the message can still fail the field-level rules for any of the existing segments.

Segment	Req'd	Comments/conditions
MSH: Message Header	R	The Quantum Hub verifies that this segment is present in the OML message.
PID: Patient Identifier	R	The Quantum Hub verifies the following: <ul style="list-style-type: none"> • This segment is present in the OML message • There is only 1 PID in the OML message
PV1: Patient Visit Data	O	If present, the Quantum Hub passes the PV1 segments through.
IN1: Insurance	R	This segment is required for all bill types (<i>Client Bill</i> (C), <i>Patient Bill</i> (P), and <i>Third-Party Bill</i> (T)). The Quantum Hub verifies that no more than 2 IN1 segments exist in the OML message. While 2 are accepted, the primary insurance information must be in the first IN1 segment, the secondary insurance information in the second IN1 segment. The Quantum Hub passes through 2 IN1 segments, if 2 are received. If only 1 IN1 is received, only 1 IN1 is passed through.
GT1: Guarantor	C	The Quantum Hub verifies that this segment is present if required by the bill type designated by IN1.47 (Coverage Type), as outlined below: <ul style="list-style-type: none"> • If IN1.47 = P (<i>Patient Bill</i>), the GT1 segment is optional • If IN1.47 = C (<i>Client Bill</i>), the GT1 segment is optional • If IN1.47 = T (<i>Third-Party Bill</i>), the GT1 segment is required If present, the Quantum Hub also verifies that there is only 1 GT1 segment in the OML message.
ORC: Common Order	R	The Quantum Hub verifies the following: <ul style="list-style-type: none"> • This segment is present in the OML message • For each ORC segment, there is one—and only one—OBR segment in the OML message ORC and OBR segments should be paired as follows: MSH

Segment	Req'd	Comments/conditions
		PID ORC OBR 1 ORC OBR 1 ORC OBR 1
TQ1: Timing/Quantity	C	The Timing/Quantity (TQ1) segment determines the quantity, frequency, priority, and timing of a service. There can be only 1 per order.
OBR: Observation Request	R	The Quantum Hub verifies the following: <ul style="list-style-type: none"> • This segment is present in the OML message • Each OBR segment is paired with an ORC segment • Only 1 OBR is associated with an ORC segment <p>Note: The Quantum Hub does not check the content of the OBR to verify if the order codes are duplicated in the OML message.</p>
DG1: Diagnosis	O	A maximum of 12 unique ICD-10 codes are permitted in an ORM message. Downstream clinical and administrative systems may not be able to successfully process the order if the content of this segment exceeds a total of 12 unique ICD-10 codes. Therefore, it is recommended that the sending system not exceed this limit. <p>If present, the Quantum Hub verifies that all of the required data in this segment is present and in compliance with the format rules.</p> <p>Note: The Quantum Hub does not check the content of the fields, and does not perform business logic checks across multiple DG1 segments.</p>
OBX: Observation Result Detail	C	AOEs associated with the order are captured as one-to-many OBX segments. If present, the Quantum Hub passes the segment through, if the data in the segment complies with the field-level rules detailed in “Order HL7 2.5.1 message segment specifications” on page 218 .
NTE: Notes and Comments	O	If present, the rules for an OML message include the following: <ul style="list-style-type: none"> • Internal comments (NTE.02 is set to I). Internal comments provide additional information helpful in proper testing or reporting. Internal comments will not appear on the report. For normal orders, only 5 NTE segments of 60 characters each (NTE.03 field width) are utilized by the lab. For PSC Hold orders, only the first 60 characters will be read • Report comments (NTE.02 is set to R). Report comments are sent to the laboratory to be placed on the report. For normal orders, only 2 NTE segments of 60 characters each (NTE.03 field width) are utilized by the lab. For PSC Hold orders, only the first 60 characters will be read <p>NTE segments can follow MSH, PID, ORC, and OBR segments in the order message.</p>

Store and forward

At the order code level, OBR.18 and OBR.19 are used as “store and forward” fields by the Quantum Hub. The Quantum Hub stores the data sent in these fields per order code, and verifies that the fields are blank when it passes them through.

At the test code level, the value for each unique occurrence of OBR.04 is preserved along with the corresponding set of OBR.18 and OBR.19 values. The Quantum Hub verifies that values for OBR.04.04 and OBR.04.05 are present.

When results are returned, the Quantum Hub matches the result to the corresponding order message and inserts the OBR.18, OBR.19, and OBR.04 data into the result.

Order-Result matching

Results are matched to orders as follows:

- The Quantum Hub compares the key fields of ORC.02, MSH.04, and MSH.06 in the ORU message to ORC.02, MSH.06, and MSH.04 in the ORM message. If there are multiple possible matches, PID.03 of the ORU message is compared to PID.03 of the ORM message to determine the correct match. Then, additional matching is done at the test code level using the following criteria:

- **Criterion 1:** OBR.04.01 in the ORU message is matched to OBR.04.04 in the OML message. If this match is successful, the store and forward fields are populated. Otherwise, Criterion 2 is evaluated

Note: If there are duplicate test codes (OBR.04.04) in the order, the Quantum Hub uses the first duplicated test code value for the order-result matching.

- **Criterion 2:** OBR.04.01 in the ORU message is matched to OBR.04.01 in the OML message. If this match is successful, the store and forward fields are populated
- If a result cannot be matched to an order using the method described above, the store and forward fields will not be populated in the outbound result file

If necessary, other store and forward fields can be defined. To define different or additional store and forward fields, consult with your project manager during the certification process.

Newline characters

Order HL7 messages must use the carriage return (CR) character (ASCII 0x0D) to indicate a segment delimiter. Order messages that contain a line feed (LF) character (ASCII 0x0A) or CRLF character (ASCII 0x0D0A) to indicate a segment delimiter will be rejected.

Field delimiters

A delimiter must separate each field. Even if a field contains no data, it must still be delimited. The delimiter for any given HL7 message is always defined in the MSH segment of the message, as the first character following the segment identifier (MSH.00). See ["Order HL7 2.5.1 message segment specifications" on page 218](#) for more detail. Standard HL7 delimiters are used.

Note: The standard HL7 delimiters (| ^ ~ \ &) are not accepted as valid data in any field, except MSH.02.

Field specifications

The following table describes the parameters used to define the data fields within each message segment.

Parameter	Description
Required	<p>The fields within each segment are classified based on their requirement status of Required (R), Optional (O), Conditional (C), or Not Supported (X) as defined below:</p> <ul style="list-style-type: none">• Required. If the corresponding segment is present, the field must also be present within the segment, and the Quantum Hub validates it against any stated requirements. If the field is not present, the message is rejected by the Quantum Hub• Optional. The field is not required; the segment is accepted by the Quantum Hub whether or not this field is present. If the field is present, the Quantum Hub validates it against any stated requirements (The contents of this field will not be reflected in the lab result)• Conditional. The field may or may not be required, depending on certain conditions (stipulated in the <i>Comments</i> column of each segment table). If the stated conditions are not met, the message is rejected by the Quantum Hub. If the field is present, the Quantum Hub validates it against any stated requirements (The contents of this field may or may not be reflected in the lab result)• Not Supported. If a field is described as Not Supported (the corresponding fields appear in <i>gray text</i> in the table), the content of the field is not used by the lab
Type	An HL7 standard data type as defined in the <i>HL7 2.5.1 Specification</i> .
Length	The maximum allowed length for the field.
Repeat	<p>Each field is classified with 1 of the following values:</p> <ul style="list-style-type: none">• N: May not repeat• Y: May repeat any number of times• Y/n: May repeat up to <i>n</i> times

Order HL7 2.5.1 message segment specifications

This section provides detailed specifications for each segment of an HL7 order message. Message segments include the following:

- “MSH—Message header segment” below
- “PID—Patient Identifier segment” on page 221
- “PV1—Patient Visit Data segment” on page 232
- “IN1—Insurance segment” on page 235
- “GT1—Guarantor segment” on page 246
- “ORC—Common order segment” on page 254
- “TQ1—Timing/Quantity segment” on page 262
- “OBR—Observation Request segment” on page 264
- “DG1—Diagnosis segment” on page 273
- “OBX—Observation/Result segment” on page 274
- “NTE—Notes and Comments segment” on page 277

Notes:

- Order message segments that are not supported are not included in this section; for detailed specifications of those segments, refer to the *HL7 Standard*
- If 1 or more of the unsupported segments are submitted, the order message will be accepted as long as it is formatted to the published *HL7 Standard*

MSH—Message header segment

The Message Header (MSH) segment defines the intent, source, destination, and some specifics of the syntax of a message.

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.00	Segment Type ID	R	ST	4	N	This is MSH.
MSH.01	Field Separator	R	ST	1	N	The separator between the message segment type ID and the first data field (MSH.02). This also defines the character to be used as a separator for the rest of the message. The value is a vertical bar ().
MSH.02	Encoding Characters	R	ST	4	N	The following characters may be used: <ul style="list-style-type: none">• ^ (component separator)• ~ (repetition separator)

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> • \ (escape character) • & (sub-component separator) <p>These values are recommended by HL7, and are the only values supported by the Quantum Hub.</p>
MSH.03	Sending Application	O	HD	227	N	The name of the sending application.
03.01	Namespace ID	O	IS			
03.02	Universal ID	O	ST			
03.03	Universal ID Type	O	ID			
MSH.04	Sending Facility	R	HD	227	N	The sending facility. This is the account number(s) defined for the placer.
04.01	Namespace ID	R	IS			
04.02	Universal ID	O	ST			
04.03	Universal ID Type	O	ID			
MSH.05	Receiving Application	O	HD	227	N	<p>The receiving application identifier.</p> <p>For PSC Hold orders, this field must be populated with PSC. Otherwise, the order is considered to be a basic lab order.</p>
05.01	Namespace ID	O	IS			
05.02	Universal ID	O	ST			
05.03	Universal ID Type	O	ID			
MSH.06	Receiving Facility	R	HD	227	N	The receiving facility. This is the three-letter ID of the facility that performs the test.
06.01	Namespace ID	R	IS			
06.02	Universal ID	O	ST			
06.03	Universal ID Type	O	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.07	Date/Time of Message	R	TS	26	N	<p>The date and time that the sending system created the message, formatted as</p> <p>yyymmddhhmmss .ssss+/-zzzz</p> <p>where .ssss is an optional fraction of the seconds, and +/-zzzz is an optional time zone offset.</p> <p>Note: All date timestamps are set to Coordinated Universal Time (UTC).</p>
MSH.08	Security	X				
MSH.09	Message Type	R	MSG	15	N	<p>The type of message being transmitted, and the event leading to the creation of the message. The value for this field is OML^O21 (<i>Laboratory Order Messages</i>).</p>
09.01	Message Type	R	ID			This is OML.
09.02	Trigger Event	R	ID			This is O21.
09.03	Message Structure	O	ID			
MSH.10	Message Control ID	R	ST	20	N	<p>A number or other data that uniquely identifies the message in its transmission to the lab system.</p> <p>If not provided, the Quantum Hub populates this field with a unique identifier (a date/time stamp followed by a four-digit random number).</p>
MSH.11	Processing ID	R	PT	3	N	<p>This indicates whether this message is intended to be processed as a production, test, or debug message.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • P: Production • T: Training

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> D: Debug (Development) The Quantum Hub verifies that the value in this field is P, T, or D.
11.01	Processing ID	R	ID			
11.02	Processing Mode	O	ID			
MSH.12	Version ID	R	VID	60	N	The value for this field is 2.5.1.
12.01	Version ID	R	ID			The value for this field is 2.5.1.
12.02	Internationalization Code	O	CE			
12.03	Internationalization Version ID	O	CE			
MSH.13	Sequence Number	X				
MSH.14	Continuation Pointer	X				
MSH.15	Accept Acknowledgment Type	X				
MSH.16	Application Acknowledgment Type	X				
MSH.17	Country Code	X				
MSH.18	Character Set	X				
MSH.19	Principal Language of Message	X				
MSH.20	Alternate Character Set Handling Scheme	X				
MSH.21	Message Profile Identifier	X				

PID—Patient Identifier segment

The Patient Identifier (PID) segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.

Note: PID.03 is a repeating field and is defined as a maximum length of 250 characters for each repeat of data.

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.00	Segment Type ID	R	ST	4	N	This is PID.
PID.01	Set ID	R	SI	4	N	This field allows identification of multiple PID segments within a message and is usually a sequential number beginning with 1.
PID.02	Patient ID (External ID)	O	CX	20	N	The placer's patient ID assigned to this order. The Quantum Hub verifies that no reserved characters (^~\&) are present.
02.01	ID Number	O	ST			
02.02	Check Digit	O	ST			
02.03	Code Identifying the Check Digit Scheme Employed	O	ID			
02.04	Assigning Authority	O	HD			
02.04.01	Namespace ID	O	IS			
02.04.02	Universal ID	O	ST			
02.04.03	Universal ID Type	O	ID			
02.05	Identifier Type Code	O	ID			
02.06	Assigning Facility	O	HD			
02.06.01	Namespace ID	O	IS			
02.06.02	Universal ID	O	ST			
02.06.03	Universal ID Type	O	ID			
02.07	Effective Date	O	DT			
02.08	Expiration Date	O	DT			
02.09	Assigning Jurisdiction	O	CWE			

Field	Name	Req'd	Type	Length	Repeat	Comments
02.09.01	Identifier	0	ST			
02.09.02	Text	0	ST			
02.09.03	Name of Coding System	0	ID			
02.09.04	Alternate Identifier	0	ST			
02.09.05	Alternate Text	0	ST			
02.09.06	Name of Alternate Coding System	0	ID			
02.09.07	Coding System Version ID	0	ST			
02.09.08	Alternate Coding System Version ID	0	ST			
02.09.09	Original Text	0	ST			
02.10	Assigning Agency or Department	0	CWE			
02.10.01	Identifier	0	ST			
02.10.02	Text	0	ST			
02.10.03	Name of Coding System	0	ID			
02.10.04	Alternate Identifier	0	ST			
02.10.05	Alternate Text	0	ST			
02.10.06	Name of Alternate Coding System	0	ID			
02.10.07	Coding System Version ID	0	ST			
02.10.08	Alternate Coding System Version ID	0	ST			
02.10.09	Original Text	0	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.03	Patient Identifier List	R	CX	250	Y	The placer's patient ID assigned to this order. The Quantum Hub verifies that no encoding characters are present. The Quantum Hub also verifies that no reserved characters (&~^\) are present in the first subfield (03.01).
03.01	ID Number	R	ST			This number is defined by the <i>Assigning Authority</i> .
03.02	Check Digit	O	ST			
03.03	Code Identifying the Check Digit Scheme Employed	O	ID			
03.04	Assigning Authority	O	HD			The valid values for <i>Assigning Authority</i> are: <ul style="list-style-type: none"> MRN: Medical Record Number CID: Chart ID If no <i>Assigning Authority</i> is present, the Quantum Hub assumes that the ID Number is a patient ID.
03.04.01	Namespace ID	O	IS			
03.04.02	Universal ID	O	ST			
03.04.03	Universal ID Type	O	ID			
03.05	Identifier Type Code	O	ID			
03.06	Assigning Facility	O	HD			
03.06.01	Namespace ID	O	IS			
03.06.02	Universal ID	O	ST			
03.06.03	Universal ID Type	O	ID			
03.07	Effective Date	O	DT			
03.08	Expiration Date	O	DT			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.09	Assigning Jurisdiction	0	CWE			
03.09.01	Identifier	0	ST			
03.09.02	Text	0	ST			
03.09.03	Name of Coding System	0	ID			
03.09.04	Alternate Identifier	0	ST			
03.09.05	Alternate Text	0	ST			
03.09.06	Name of Alternate Coding System	0	ID			
03.09.07	Coding System Version ID	0	ST			
03.09.08	Alternate Coding System Version ID	0	ST			
03.09.09	Original Text	0	ST			
03.10	Assigning Agency or Department	0	CWE			
03.10.01	Identifier	0	ST			
03.10.02	Text	0	ST			
03.10.03	Name of Coding System	0	ID			
03.10.04	Alternate Identifier	0	ST			
03.10.05	Alternate Text	0	ST			
03.10.06	Name of Alternate Coding System	0	ID			
03.10.07	Coding System Version ID	0	ST			
03.10.08	Alternate Coding System Version ID	0	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.10.09	Original Text	O	ST			
PID.04	Alternate Patient ID	X				
PID.05	Patient Name	R	XPN	250	Y	<p>This field must adhere to the following:</p> <ul style="list-style-type: none"> • No reserved characters (~\&) are allowed (verified by the Quantum Hub) • A numeric value cannot be used as the first character of the last name • There must be at least 1 character for first and last name • The entire patient name (excluding the delimiter) cannot exceed 24 characters, with the following constraints for the subfields: <ul style="list-style-type: none"> • The last name can be a maximum of 20 characters. Any last name longer than the allowed limit is truncated in the corresponding result message • The first name is limited to the difference between the number of characters in the last name and 24. For example, if the last name is 14 characters, the first name is limited to 10 characters. Any first name longer than the allowed limit is truncated in the corresponding result message • If the middle name is within the entire name limit of 24 characters, it is returned in the corresponding result message. Otherwise, if the limit is exceeded, a minimum of the first character of the middle initial is always returned in the result message

Field	Name	Req'd	Type	Length	Repeat	Comments
						Note: These length limitations do not apply to requisitions and ABNs generated via the RESTful and SOAP-based Order Submission web services. Names appear on the requisitions and ABNs as they are submitted in the order message.
05.01	Family Name	R	FN			
05.01.01	Surname	R	ST			
05.01.02	Own Surname Prefix	O	ST			
05.01.03	Own Surname	O	ST			
05.01.04	Surname Prefix from Partner	O	ST			
05.01.05	Surname from Partner	O	ST			
05.02	Given Name	R	ST			
05.03	Middle Initial or Name	O	ST			
05.04	Suffix	O	ST			
05.05	Prefix	O	ST			
05.06	Degree (Deprecated)	X				
05.07	Name Type Code	O	ID			
05.08	Name Representation Code	O	ID			
05.09	Name Context	O	CE			
05.09.01	Identifier	O	ST			
05.09.02	Text	O	ST			
05.09.03	Name of Coding System	O	ID			
05.09.04	Alternate Identifier	O	ST			
05.09.05	Alternate Text	O	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
05.09.06	Name of Alternate Coding System	O	ID			
05.10	Name Validity Range (Deprecated)	X				
05.11	Name Assembly Order	O	ID			
05.12	Effective Date	O	TS			
05.13	Expiration Date	O	TS			
05.14	Professional Suffix	O	ST			
PID.06	Mother's Maiden Name	X				
PID.07	Date/Time of Birth	R	TS	26	N	This field is the date of birth (DOB), formatted as: yyyymmddhhmm The Quantum Hub verifies that the DOB is in this format.
PID.08	Administrative Sex	R	IS	1	N	The valid values for this field are: <ul style="list-style-type: none"> M: Male F: Female
PID.09	Patient Alias Race	X				
PID.11	Patient Address	C	XAD	250	Y	The patient's address, formatted as: 1000 Parkway Drive^Apt. 4^ Mason^OH^45040^^^^^ This field is required if IN1.47 (Coverage Type) is P or T.
11.01	Street Address	C	SAD			
11.01.01	Street or Mailing Address	C	ST			
11.01.02	Street Name	O	ST			
11.01.03	Dwelling Number	C	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
11.02	Other Designation	O	ST			
11.03	City	O	ST			
11.04	State or Province	C	ST			
11.05	Zip or Postal Code	C	ST			
11.06	Country	O	ID			
11.07	Address Type	O	ID			
11.08	Other Geographic Designation	O	ST			
11.09	County or Parish Code	O	IS			
11.10	Census Tract	O	IS			
11.11	Address Representation Code	O	ID			
11.12	Address Validity Range (Deprecated)	X				
11.13	Effective Date	O	TS			
11.14	Expiration Date	O	TS			
PID.12	County Code	X				
PID.13	Phone Number - Home	C	XTN	250	Y	<p>For backward compatibility, phone numbers sent in the 10 NM format (for example, 3148721727) or any of the following variations for sending data in the XTN data format will also be accepted:</p> <p> 3148727127^^^^^^^ or 3148727127^^^^^314^8727127^ ^ or ^^^^^314^8727127^^ or</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
						3148727127 This field is required if IN1.47 (Coverage Type) is P or T.
13.01	Phone Number String (Deprecated)	X				
13.02	Tele-communication Use Code	O	ID			
13.03	Tele-communication Equipment Type	C	ID			
13.04	Email Address	C	ST			
13.05	Country Code	C	NM			
13.06	Area or City Code	C	NM			
13.07	Phone Number	C	NM			
13.08	Extension	C	NM			
13.09	Any Text	C	ST			
13.10	Extension Prefix	X				
13.11	Speed Dial Code	X				
13.12	Unformatted Telephone Number	X				
PID.14	Phone Number - Business	X				
PID.15	Primary Language	X				
PID.16	Marital Status	X				
PID.17	Religion	X				
PID.18	Patient Account Number	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.19	SSN Number - Patient	X				
PID.20	Driver's Lic Num - Patient	X				
PID.21	Mother's Identifier	X				
PID.22	Ethnic Group	O	CE	250	Y	
PID.23	Birth Place	X				
PID.24	Multiple Birth Indicator	X				
PID.25	Birth Order	X				
PID.26	Citizenship	X				
PID.27	Veterans Military Status	X				
PID.28	Nationality	X				
PID.29	Patient Death Date & Time	X				
PID.30	Patient Death Indicator	X				
PID.31	Identity Unknown Indicator	X				
PID.32	Identity Reliability Code	X				
PID.33	Last Update Date/Time	X				
PID.34	Last Update Facility	X				
PID.35	Species Code	X				
PID.36	Breed Code	X				
PID.37	Strain	X				
PID.38	Production Class Code	X				
PID.39	Tribal Citizenship	X				

PV1—Patient Visit Data segment

The Patient Visit Data (PV1) segment is used by registration/patient administration applications to communicate information on a visit-specific basis. This segment can be used to send multiple-visit statistic records to the same patient account, or single-visit records to more than one account.

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.00	Segment Type ID	R	ST	4	N	This field is PV1.
PV1.01	Set ID	R	SI	4	N	
PV1.02	Patient Class	X				
PV1.03	Assigned Patient Location	O	PL	80	N	The patient's current location (inpatient or outpatient).
03.01	Point of Care	O	IS			
03.02	Room	O	IS			
03.03	Bed	O	IS			
03.04	Facility	O	HD			
03.04.01	Namespace ID	O	IS			
03.04.02	Universal ID	O	ST			
03.04.03	Universal ID Type	O	ID			
03.05	Location Status	O	IS			
03.06	Patient Location Type	O	IS			
03.07	Building	O	IS			
03.08	Floor	O	IS			
03.09	Location Description	O	ST			
PV1.04	Admission Type	X				
PV1.05	Preadmit Number	X				
PV1.06	Prior Patient Location	X				
PV1.07	Attending Doctor	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.08	Referring Doctor	X				
PV1.09	Consulting Doctor	X				
PV1.10	Hospital Service	X				
PV1.11	Temporary Location	X				
PV1.12	Preadmit Test Indicator	X				
PV1.13	Readmission Indicator	X				
PV1.14	Admit Source	X				
PV1.15	Ambulatory Status	X				
PV1.16	VIP Indicator	X				
PV1.17	Admitting Doctor	X				
PV1.18	Patient Type	X				
PV1.19	Visit Number	X				
PV1.20	Financial Class	X				
PV1.21	Charge Price Indicator	X				
PV1.22	Courtesy Code	X				
PV1.23	Credit Rating	X				
PV1.24	Contract Code	X				
PV1.25	Contract Effective Date	X				
PV1.26	Contract Amount	X				
PV1.27	Contract Period	X				
PV1.28	Interest Code	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.29	Transfer to Bad Debt Code	X				
PV1.30	Transfer to Bad Debt Date	X				
PV1.31	Bad Debt Agency Code	X				
PV1.32	Bad Debt Transfer Amount	X				
PV1.33	Bad Debt Recovery Amount	X				
PV1.34	Delete Account Indicator	X				
PV1.35	Delete Account Date	X				
PV1.36	Discharge Disposition	X				
PV1.37	Discharged to Location	X				
PV1.38	Diet Type	X				
PV1.39	Servicing Facility	X				
PV1.40	Bed Status	X				
PV1.41	Account Status	X				
PV1.42	Pending Location	X				
PV1.43	Prior Temporary Location	X				
PV1.44	Admit Date/Time	O	TS	26	N	This is the hospital admission date, formatted as: yyyymmdd
PV1.45	Discharge Date/Time	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.46	Current Patient Balance	X				
PV1.47	Total Charges	X				
PV1.48	Total Adjustments	X				
PV1.49	Total Payments	X				
PV1.50	Alternate Visit ID	X				
PV1.51	Visit Indicator	X				
PV1.52	Other Healthcare Provider	X				

IN1—Insurance segment

The Insurance (IN1) segment contains insurance policy coverage information necessary to produce properly pro-rated and patient and insurance bills. This segment is applicable only to the inbound order for insurance billing. The Quantum Hub verifies that all data fields are in uppercase.

Field	Name	Req'd	Type	Length	Repeat	Comments
IN1.00	Segment Type ID	R	ST	4	N	This field is IN1.
IN1.01	Set ID	R	SI	4	N	IN1 message segments should be numbered sequentially from 1.
IN1.02	Insurance Plan ID	X				
IN1.03	Insurance Company ID	O	CX	250	Y	This is the QDI Bill mnemonic.
03.01	ID Number	O	ST			
03.02	Check Digit	O	ST			
03.03	Code Identifying the Check Digit Scheme Employed	O	ID			
03.04	Assigning Authority	O	HD			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.04.01	Namespace ID	0	IS			
03.04.02	Universal ID	0	ST			
03.04.03	Universal ID Type	0	ID			
03.05	Identifier Type Code	0	ID			
03.06	Assigning Facility	0	HD			
03.06.01	Namespace ID	0	IS			
03.06.02	Universal ID	0	ST			
03.06.03	Universal ID Type	0	ID			
03.07	Effective Date	0	DT			
03.08	Expiration Date	0	DT			
03.09	Assigning Jurisdiction	0	CWE			
03.09.01	Identifier	0	ST			
03.09.02	Text	0	ST			
03.09.03	Name of Coding System	0	ID			
03.09.04	Alternate Identifier	0	ST			
03.09.05	Alternate Text	0	ST			
03.09.06	Name of Alternate Coding System	0	ID			
03.09.07	Coding System Version ID	0	ST			
03.09.08	Alternate Coding System Version ID	0	ST			
03.09.09	Original Text	0	ST			
03.10	Assigning Agency or Department	0	CWE			
03.10.01	Identifier	0	ST			
03.10.02	Text	0	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.10.03	Name of Coding System	O	ID			
03.10.04	Alternate Identifier	O	ST			
03.10.05	Alternate Text	O	ST			
03.10.06	Name of Alternate Coding System	O	ID			
03.10.07	Coding System Version ID	O	ST			
03.10.08	Alternate Coding System Version ID	O	ST			
03.10.09	Original Text	O	ST			
IN1.04	Insurance Company Name	C	XON	50	Y	This field is required if IN1.47 (Coverage Type) is \neq .
04.01	Organization Name	C	ST			
04.02	Organization Name Type Code	C	IS			
04.03	ID Number (Deprecated)	X				
04.04	Check Digit	C	NM			
04.05	Code Identifying the Check Digit Scheme Employed	C	ID			
04.06	Assigning Authority	C	HD			
04.06.01	Namespace ID	C	IS			
04.06.02	Universal ID	C	ST			
04.06.03	Universal ID Type	C	ID			
04.07	Identifier Type Code	C	ID			
04.08	Assigning Facility ID	C	HD			

Field	Name	Req'd	Type	Length	Repeat	Comments
04.08.01	Namespace ID	C	IS			
04.08.02	Universal ID	C	ST			
04.08.03	Universal ID Type	C	ID			
04.09	Name Representation Code	C	ID			
04.10	Organization Identifier	C	ST			
IN1.05	Insurance Company Address	C	XAD	250	Y	This field is required if IN1.47 (Coverage Type) is T.
05.01	Street Address	C	SAD			
05.01.01	Street or Mailing Address	C	ST			
05.01.02	Street Name	C	ST			
05.01.03	Dwelling Number	C	ST			
05.02	Other Designation	C	ST			
05.03	City	C	ST			
05.04	State or Province	C	ST			
05.05	Zip or Postal Code	C	ST			
05.06	Country	C	ID			
05.07	Address Type	C	ID			
05.08	Other Geographic Designation	C	ST			
05.09	County or Parish Code	C	IS			
05.10	Census Tract	C	IS			
05.11	Address Representation Code	C	ID			
05.11.12	Address Validity Range (Deprecated)	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
05.13	Effective Date	C	TS			
05.14	Expiration Date	C	TS			
IN1.06	Insurance Co. Contact Person	X				
IN1.07	Insurance Co Phone Number	O	XTN	250	Y	
07.01	Phone Number String (Deprecated)	X				
07.02	Tele- communication Use Code	O	ID			
07.03	Tele- communication Equipment Type	O	ID			
07.04	Email Address	O	ST			
07.05	Country Code	O	NM			
07.06	Area or City Code	O	NM			
07.07	Phone Number	O	NM			
07.08	Extension	O	NM			
07.09	Any Text	O	ST			
07.10	Extension Prefix	X	ST			
07.11	Speed Dial Code	X	ST			
07.12	Unformatted Telephone Number	X	ST			
IN1.08	Group Number	C	ST	12	N	This field is required if IN1.47 (Coverage Type) is T. The permitted characters are A-Z and 1-0.
IN1.09	Group Name	X				
IN1.10	Insured's Group Emp ID	X				
IN1.11	Insured's Group Emp Name	O	XON	250	Y	

Field	Name	Req'd	Type	Length	Repeat	Comments
11.01	Organization Name	0	ST			
11.02	Organization Name Type Code	0	IS			
11.03	ID Number (Deprecated)	X				
11.04	Check Digit	0	NM			
11.05	Code Identifying the Check Digit Scheme Employed	0	ID			
11.06	Assigning Authority	0	HD			
11.06.01	Namespace ID	0	IS			
11.06.02	Universal ID	0	ST			
11.06.03	Universal ID Type	0	ID			
11.07	Identifier Type Code	0	ID			
11.08	Assigning Facility ID	0	HD			
11.08.01	Namespace ID	0	IS			
11.08.02	Universal ID	0	ST			
11.08.03	Universal ID Type	0	ID			
11.09	Name Representation Code	0	ID			
11.10	Organization Identifier	0	ST			
IN1.12	Plan Effective Date	X				
IN1.13	Plan Expiration Date	X				
IN1.14	Authorization Information	X				
IN1.15	Plan Type	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
IN1.16	Name Of Insured	C	XPN	250	Y	<p>This field is required if IN1.47 (Coverage Type) is T. Entries must adhere to the following:</p> <ul style="list-style-type: none"> • A numeric value cannot be used as the first character of the last name • There must be at least 1 character for first and last name • The entire name (excluding the delimiter) cannot exceed 24 characters, with the following constraints for the subfields: <ul style="list-style-type: none"> • The last name can be a maximum of 20 characters. Any last name longer than the allowed limit is truncated in the result message • The first name is limited to the difference between the number of characters in the last name and 24. For example, if the last name is 14 characters, the first name is limited to 10 characters. Any first name longer than the limit is truncated in the result message • If the middle name is within the entire name limit of 24 characters, it is returned in the corresponding result message. Otherwise, if the limit is exceeded, a minimum of the first character of the middle initial is always returned in the result message

Field	Name	Req'd	Type	Length	Repeat	Comments
16.01	Family Name	R	FN			
16.01.01	Surname	R	ST			
16.01.02	Own Surname Prefix	C	ST			
16.01.03	Own Surname	C	ST			
16.01.04	Surname Prefix from Partner	C	ST			
16.01.05	Surname from Partner	C	ST			
16.02	Given Name	R	ST			
16.03	Middle Initial or Name	C	ST			
16.04	Suffix	C	ST			
16.05	Prefix	C	ST			
16.06	Degree (Deprecated)	X				
16.07	Name Type Code	C	ID			
16.08	Name Representation Code	C	ID			
16.09	Name Context	C	CE			
16.09.01	Identifier	C	ST			
16.09.02	Text	C	ST			
16.09.03	Name of Coding System	C	ID			
16.09.04	Alternate Identifier	C	ST			
16.09.05	Alternate Text	C	ST			
16.09.06	Name of Alternate Coding System	C	ID			
16.10	Name Validity Range (Deprecated)	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
16.11	Name Assembly Order	C	ID			
16.12	Effective Date	C	TS			
16.13	Expiration Date	C	TS			
16.14	Professional Suffix	C	ST			
IN1.17	Insured's Relationship To Patient	C	CE	250	N	This field is required if IN1.47 (Coverage Type) is T. Valid values for this field are: <ul style="list-style-type: none"> • 1: Self • 2: Spouse • 8: Dependent
1.17.01	Identifier	C	ST			
1.17.02	Text	C	ST			
1.17.03	Name of Coding System	C	ID			
1.17.04	Alternate Identifier	C	ST			
1.17.05	Alternate Text	C	ST			
1.17.06	Name of Alternate Coding System	C	ID			
IN1.18	Insured's Date Of Birth	X				
IN1.19	Insured's Address	O	XAD	250	Y	This field is required if IN1.47 (Coverage Type) is T.
19.01	Street Address	C	SAD			
19.01.01	Street or Mailing Address	C	ST			
19.01.02	Street Name	C	ST			
19.01.03	Dwelling Number	C	ST			
19.02	Other Designation	C	ST			
19.03	City	C	ST			
19.04	State or Province	C	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
19.05	Zip or Postal Code	C	ST			
19.06	Country	C	ID			
19.07	Address Type	C	ID			
19.08	Other Geographic Designation	C	ST			
19.09	County or Parish Code	C	IS			
19.10	Census Tract	C	IS			
19.11	Address Representation Code	C	ID			
19.11.12	Address Validity Range (Deprecated)	X				
19.13	Effective Date	C	TS			
19.14	Expiration Date	C	TS			
IN1.20	Assignment Of Benefits	X				
IN1.21	Coordination Of Benefits	X				
IN1.22	Coord Of Ben. Priority	X				
IN1.23	Notice Of Admission Flag	X				
IN1.24	Notice Of Admission Date	X				
IN1.25	Report Of Eligibility Flag	X				
IN1.26	Report Of Eligibility Date	X				
IN1.27	Release Information Code	X				
IN1.28	Pre-Admit Cert (PAC)	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
IN1.29	Verification Date/Time	X				
IN1.30	Verification By	X				
IN1.31	Type Of Agreement Code	X				
IN1.32	Billing Status	X				
IN1.33	Lifetime Reserve Days	X				
IN1.34	Delay Before L.R. Day	X				
IN1.35	Company Plan Code	O	IS	8	N	This field further identifies an insurance plan.
IN1.36	Policy Number	C	ST	20	N	This field is required if IN1.47 (Coverage Type) is T. This is the individual policy number of the insured, and is required for Medicare submissions.
IN1.37	Policy Deductible	X				
IN1.38	Policy Limit - Amount	X				
IN1.39	Policy Limit - Days	X				
IN1.40	Room Rate - Semi-Private	X				
IN1.41	Room Rate - Private	X				
IN1.42	Insured's Employment Status	X				
IN1.43	Insured's Administrative Sex	X				
IN1.44	Insured's Employer Address	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
IN1.45	Verification Status	X				
IN1.46	Prior Insurance Plan ID	X				
IN1.47	Coverage Type	R	IS	3	N	<p>Valid values for this field are:</p> <ul style="list-style-type: none"> • T: Third-party bill • P: Patient bill • C: Client bill <p>Note: If IN1.47 = T, the GT1 segment is required.</p> <p>Rules for requirement of the IN1/GT1 segment are addressed in “Order HL7 2.5.1 message format requirements” on page 213.</p>
IN1.48	Handicap	X				
IN1.49	Insured's ID Number	X				
IN1.50	Signature Code	X				
IN1.51	Signature Code Date	X				
IN1.52	Insured's Birth Place	X				
IN1.53	VIP Indicator	X				

GT1—Guarantor segment

The Guarantor (GT1) segment contains guarantor (for example, the person or the organization with financial responsibility for payment of a patient account) data for patient and insurance billing applications. This segment is applicable only to the inbound order for patient and insurance billing. The Quantum Hub verifies that all data fields are in uppercase.

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.00	Segment Type ID	R	ST	4	N	This field is GT1.
GT1.01	Set ID	C	SI	4	N	GT1 message segments should be numbered sequentially from 1.
GT1.02	Guarantor Number	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.03	Guarantor Name	C	XPN	250	Y	<p>This field is required if IN1.47 (<i>Coverage Type</i>) is P or T, and it must adhere to the following rules:</p> <ul style="list-style-type: none"> • No reserved characters (~\&) are allowed (verified by the Quantum Hub) • A numeric value cannot be used as the first character of the last name • There must be at least 1 character for first and last name • The entire name (excluding the delimiter) cannot exceed 24 characters, with the following constraints for the subfields: <ul style="list-style-type: none"> • The last name can be a maximum of 20 characters. Any last name longer than the allowed limit is truncated in the corresponding result message • The first name is limited to the difference between the number of characters in the last name and 24. For example, if the last name is 14 characters, the first name is limited to 10 characters. Any first name longer than the allowed limit is truncated in the corresponding result message • If the middle name is within the entire name limit of 24 characters, it is returned in the corresponding result message. Otherwise, if the limit is exceeded, a minimum of the first character of the middle initial is always returned in the result message

Field	Name	Req'd	Type	Length	Repeat	Comments
						Note: These length limitations do not apply to requisitions and ABNs generated via the RESTful and SOAP-based Order Submission web services. Names appear on the requisitions and ABNs as they are submitted in the order message.
03.01	Family Name	C	FN			
03.01.01	Surname	C	ST			
03.01.02	Own Surname Prefix	O	ST			
03.01.03	Own Surname	O	ST			
03.01.04	Surname Prefix from Partner	O	ST			
03.01.05	Surname from Partner	O	ST			
03.02	Given Name	C	ST			
03.03	Middle Initial or Name	O	ST			
03.04	Suffix	O	ST			
03.05	Prefix	O	ST			
03.06	Degree (Deprecated)	X				
03.07	Name Type Code	O	ID			
03.08	Name Representation Code	O	ID			
03.09	Name Context	O	CE			
03.09.01	Identifier	O	ST			
03.09.02	Text	O	ST			
03.09.03	Name of Coding System	O	ID			
03.09.04	Alternate Identifier	O	ST			
03.09.05	Alternate Text	O	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.09.06	Name of Alternate Coding System	O	ID			
03.10	Name Validity Range (Deprecated)	X				
03.11	Name Assembly Order	O	ID			
03.12	Effective Date	O	TS			
03.13	Expiration Date	O	TS			
03.14	Professional Suffix	O	ST			
GT1.04	Guarantor Spouse Name	X				
GT1.05	Guarantor Address	C	XAD	250	Y	This field is required if IN1.47 (Coverage Type) is P or T.
05.01	Street Address	O	SAD			
05.01.01	Street or Mailing Address	C	ST			
05.01.02	Street Name	O	ST			
05.01.03	Dwelling Number	O	ST			
05.02	Other Designation	O	ST			
05.03	City	C	ST			
05.04	State or Province	O	ST			
05.05	Zip or Postal Code	O	ST			
05.06	Country	O	ID			
05.07	Address Type	O	ID			
05.08	Other Geographic Designation	O	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
05.09	County or Parish Code	0	IS			
05.10	Census Tract	0	IS			
05.11	Address Representation Code	0	ID			
05.11.12	Address Validity Range (Deprecated)	X				
05.13	Effective Date	0	TS			
05.14	Expiration Date	0	TS			
GT1.06	Guarantor Phone Number - Home	C	XTN	250	Y	<p>This field is required if IN1.47 (Coverage Type) is P or T. For backward compatibility, phone numbers sent in the 10-number format (for example, 3148721727) or any of the following variations for sending data in the XTN data format will also be accepted:</p> <p> 3148727127^^^^^^^ or 3148727127^^^^^314^8727127^ ^ or ^^^^^314^8727127^^ or 3148727127 </p>
06.01	Phone Number String (Deprecated)	X				
06.02	Tele-communication Use Code	0	ID			
06.03	Tele-communication Equipment Type	0	ID			
06.04	Email Address	0	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
06.05	Country Code	O	NM			
06.06	Area or City Code	C	NM			
06.07	Phone Number	C	NM			
06.08	Extension	O	NM			
06.09	Any Text	O	ST			
06.10	Extension Prefix	X	ST			
06.11	Speed Dial Code	X	ST			
06.12	Unformatted Telephone Number	X	ST			
GT1.07	Guarantor Phone Number - Business	X				
GT1.08	Guarantor Date/Time Of Birth	X				
GT1.09	Guarantor Administrative Sex	X				
GT1.10	Guarantor Type	X				
GT1.11	Guarantor Relationship	X				
GT1.12	Guarantor SSN	X				
GT1.13	Guarantor Date - Begin	X				
GT1.14	Guarantor Date - End	X				
GT1.15	Guarantor Priority	X				
GT1.16	Guarantor Employer Name	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.17	Guarantor Employer Address	X				
GT1.18	Guarantor Employer Phone Number	X				
GT1.19	Guarantor Employee ID Number	X				
GT1.20	Guarantor Employment Status	X				
GT1.21	Guarantor Organization Name	X				
GT1.22	Guarantor Billing Hold Flag	X				
GT1.23	Guarantor Credit Rating Code	X				
GT1.24	Guarantor Death Date And Time	X				
GT1.25	Guarantor Death Flag	X				
GT1.26	Guarantor Charge Adjustment Code	X				
GT1.27	Guarantor Household Annual Income	X				
GT1.28	Guarantor Household Size	X				
GT1.29	Guarantor Employer ID Number	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.30	Guarantor Marital Status Code	X				
GT1.31	Guarantor Hire Effective Date	X				
GT1.32	Employment Stop Date	X				
GT1.33	Living Dependency	X				
GT1.34	Ambulatory Status	X				
GT1.35	Citizenship	X				
GT1.36	Primary Language	X				
GT1.37	Living Arrangement	X				
GT1.38	Publicity Code	X				
GT1.39	Protection Indicator	X				
GT1.40	Student Indicator	X				
GT1.41	Religion	X				
GT1.42	Mother's Maiden Name	X				
GT1.43	Nationality	X				
GT1.44	Ethnic Group	X				
GT1.45	Contact Person's Name	X				
GT1.46	Contact Person's Telephone Number	X				
GT1.47	Contact Reason	X				
GT1.48	Contact Relationship	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
GT1.49	Contact Job Title	X				
GT1.50	Job Code/Class	X				
GT1.51	Guarantor Employer's Organization Name	X				
GT1.52	Handicap	X				
GT1.53	Job Status	X				
GT1.54	Guarantor Financial Class	X				
GT1.55	Guarantor Race	X				
GT1.56	Guarantor Birth Place	X				
GT1.57	VIP Indicator	X				

ORC—Common order segment

The Common Order (ORC) segment is used to transmit fields that are common to all orders (all types of services that are requested). The ORC segment is required in the OML message.

Field	Name	Req'd	Type	Length	Repeat	Comments
ORC.00	Segment Type ID	R	ST	4	N	This field is ORC.
ORC.01	Order Control	R	ID	2	N	This field accepts any order control code listed in the order control codes table (<i>HL7 table 0119—Order control</i>).
ORC.02	Placer Order Number	R	EI	22	N	<p>The placer application's order number.</p> <p>The Quantum Hub verifies the following:</p> <ul style="list-style-type: none"> • This field is present • The value in ORC 02.01 (Entity Identifier) is the same as the value in OBR 02.01 (Entity Identifier) • All values for this field in all ORC and OBR segments are identical

Field	Name	Req'd	Type	Length	Repeat	Comments
						Otherwise, the order will be rejected. Note: The Quantum Hub does not require unique order numbers. The service provider is responsible for handling any duplicate order numbers that are received.
02.01	Entity Identifier	R	ST			This must match OBR 02.01 (Entity Identifier) or the order will be rejected.
02.02	Namespace ID	O	IS			
02.03	Universal ID	O	ST			
02.04	Universal ID Type	O	ID			
ORC.03	Filler Order Number	X				
ORC.04	Placer Group Number	X				
ORC.05	Order Status	X				
ORC.06	Response Flag	X				
ORC.07	Quantity/Timing	X				
ORC.08	Parent	X				
ORC.09	Date/Time of Transaction	X				
ORC.10	Entered By	X				
ORC.11	Verified By	O	XCN	250	Y	This identifies the non-physician provider (NPP) who verified the accuracy of the entered request, formatted as: NPP_ID^NPP_Name
11.01	ID Number	O	ST			This is the NPP_ID.
11.02	Family Name	O	FN			This is the NPP_Name.
11.02.01	Surname	O	ST			
11.02.02	Own Surname Prefix	O	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
11.02.03	Own Surname	0	ST			
11.02.04	Surname Prefix from Partner	0	ST			
11.02.05	Surname from Partner	0	ST			
11.03	Given Name	0	ST			
11.04	Middle Initial or Name	0	ST			
11.05	Suffix	0	ST			
11.06	Prefix	0	ST			
11.07	Degree (Deprecated)	X				
11.08	Source Table	0	ST			
11.09	Assigning Authority	0	HD			
11.09.01	Namespace ID	0	IS			
11.09.02	Universal ID	0	ST			
11.09.03	Universal ID Type	0	ID			
11.10	Name Type Code	0	ID			
11.11	Identifier Check Digit	0	ST			
11.12	Code Identifying the Check Digit Scheme Employed	0	ID			
11.13	Identifier Type Code	0	IS			
11.14	Assigning Facility	0	HD			
11.14.01	Namespace ID	0	IS			
11.14.02	Universal ID	0	ST			
11.14.03	Universal ID Type	0	ID			
11.15	Name Representation Code	0	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
11.16	Name Context	0	CE			
11.16.01	Identifier	0	ST			
11.16.02	Text	0	ST			
11.16.03	Name of Coding System	0	ID			
11.16.04	Alternate Identifier	0	ST			
11.16.05	Alternate Text	0	ST			
11.16.06	Name of Alternate Coding System	0	ID			
11.17	Name Validity Range (Deprecated)	X				
11.18	Name Assembly Order	0	ID			
11.19	Effective Date	0	TS			
11.20	Expiration Date	0	TS			
11.21	Professional Suffix	0	ST			
11.22	Assigning Jurisdiction	0	CWE			
11.22.01	Identifier	0	ST			
11.22.02	Text	0	ST			
11.22.03	Name of Coding System	0	ID			
11.22.04	Alternate Identifier	0	ST			
11.22.05	Alternate Text	0	ST			
11.22.06	Name of Alternate Coding System	0	ID			
11.22.07	Coding System Version ID	0	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
11.22.08	Alternate Coding System Version ID	0	ST			
11.22.09	Original Text	0	ST			
11.23	Assigning Agency or Department	0	CWE			
11.23.01	Identifier	0	ST			
11.23.02	Text	0	ST			
11.23.03	Name of Coding System	0	ID			
11.23.04	Alternate Identifier	0	ST			
11.23.05	Alternate Text	0	ST			
11.23.06	Name of Alternate Coding System	0	ID			
11.23.07	Coding System Version ID	0	ST			
11.23.08	Alternate Coding System Version ID	0	ST			
11.23.09	Original Text	0	ST			
ORC.12	Ordering Provider	R	XCN	250	Y	This identifies the provider who ordered the test (same as OBR.16).
12.01	ID Number	R	ST			This is the NPI.
12.02	Family Name	R	FN			This is the ordering provider's last name.
12.02.01	Surname	R	ST			
12.02.02	Own Surname Prefix	0	ST			
12.02.03	Own Surname	0	ST			
12.02.04	Surname Prefix from Partner	0	ST			
12.02.05	Surname from Partner	0	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
12.03	Given Name	R	ST			This is the ordering provider's first name.
12.04	Middle Initial or Name	O	ST			This is the ordering provider's middle name or initial.
12.05	Suffix	O	ST			
12.06	Prefix	O	ST			
12.07	Degree (Deprecated)	X				
12.08	Source Table	O	ST			
12.09	Assigning Authority	R	HD			This is the NPI.
12.09.01	Namespace ID	O	IS			
12.09.02	Universal ID	O	ST			
12.09.03	Universal ID Type	O	ID			
12.10	Name Type Code	O	ID			
12.11	Identifier Check Digit	O	ST			
12.12	Code Identifying the Check Digit Scheme Employed	O	ID			
12.13	Identifier Type Code	O	IS			
12.14	Assigning Facility	O	HD			
12.14.01	Namespace ID	O	IS			
12.14.02	Universal ID	O	ST			
12.14.03	Universal ID Type	O	ID			
12.15	Name Representation Code	O	ID			
12.16	Name Context	O	CE			
12.16.01	Identifier	O	ST			
12.16.02	Text	O	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
12.16.03	Name of Coding System	0	ID			
12.16.04	Alternate Identifier	0	ST			
12.16.05	Alternate Text	0	ST			
12.16.06	Name of Alternate Coding System	0	ID			
12.17	Name Validity Range (Deprecated)	X				
12.18	Name Assembly Order	0	ID			
12.19	Effective Date	0	TS			
12.20	Expiration Date	0	TS			
12.21	Professional Suffix	0	ST			
12.22	Assigning Jurisdiction	0	CWE			
12.22.01	Identifier	0	ST			
12.22.02	Text	0	ST			
12.22.03	Name of Coding System	0	ID			
12.22.04	Alternate Identifier	0	ST			
12.22.05	Alternate Text	0	ST			
12.22.06	Name of Alternate Coding System	0	ID			
12.22.07	Coding System Version ID	0	ST			
12.22.08	Alternate Coding System Version ID	0	ST			
12.22.09	Original Text	0	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
12.23	Assigning Agency or Department	0	CWE			
12.23.01	Identifier	0	ST			
12.23.02	Text	0	ST			
12.23.03	Name of Coding System	0	ID			
12.23.04	Alternate Identifier	0	ST			
12.23.05	Alternate Text	0	ST			
12.23.06	Name of Alternate Coding System	0	ID			
12.23.07	Coding System Version ID	0	ST			
12.23.08	Alternate Coding System Version ID	0	ST			
12.23.09	Original Text	0	ST			
ORC.13	Enterer's Location	X				
ORC.14	Call Back Phone Number	X				
ORC.15	Order Effective Date/Time	X				
ORC.16	Order Control Code Reason	X				
ORC.17	Entering Organization	X				
ORC.18	Entering Device	X				
ORC.19	Action By	X				
ORC.20	Advanced Beneficiary Notice Code	X				
ORC.21	Ordering Facility Name	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
ORC.22	Ordering Facility Address	X				
ORC.23	Ordering Facility Phone Number	X				
ORC.24	Ordering Provider Address	X				
ORC.25	Order Status Modifier	X				
ORC.26	Advanced Beneficiary Notice Override Reason	X				
ORC.27	Filler's Expected Availability Date/Time	X				
ORC.28	Confidentiality Code	X				
ORC.29	Order Type	X				
ORC.30	Enterer Authorization Mode	X				
ORC.31	Parent Universal Service Identifier	X				

TQ1—Timing/Quantity segment

The Timing/Quantity (TQ1) segment determines the quantity, frequency, priority, and timing of a service.

Field	Name	Req'd	Type	Length	Repeat	Comments
TQ1.00	Segment Type ID	R	ST	4	N	This is TQ1.
TQ1.01	Set ID - TQ1	O	SI	4	N	
TQ1.02	Quantity	X				
TQ1.03	Repeat Pattern	X				
TQ1.04	Explicit Time	X				
TQ1.05	Relative Time and Units	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
TQ1.06	Service Duration	X				
TQ1.07	Start Date/Time	0	TS	26	N	
TQ1.08	End Date/Time	X				
TQ1.09	Priority	0	CWE	250	Y	
09.01	Identifier	0	ST			
09.02	Text	0	ST			
9.03	Name of Coding System	0	ID			
09.04	Alternate Identifier	0	ST			
09.05	Alternate Text	0	ST			
09.06	Name of Alternate Coding System	0	ID			
09.07	Coding System Version ID	0	ST			
09.08	Alternate Coding System Version ID	0	ST			
09.09	Original Text	0	ST			
TQ1.10	Condition Text	X				
TQ1.11	Text Instruction	X				
TQ1.12	Conjunction	X				
TQ1.13	Occurrence Duration	X				
TQ1.14	Total Occurrences	X				

OBR—Observation Request segment

One OBR segment must be transmitted for each Order Code associated with any PID segment. This segment is mandatory in OML messages.

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.00	Segment Type ID	R	ST	4	N	This is OBR.
OBR.01	Set ID	O	SI	4	N	OBR segments are paired with an ORC segment.
OBR.02	Placer Order Number	R	EI	22	N	<p>The placer application's order number.</p> <p>The Quantum Hub verifies the following:</p> <ul style="list-style-type: none"> • This field is present • The value in ORC 02.01 (Entity Identifier) is the same as the value in OBR 02.01 (Entity Identifier) • All values for this field in all ORC and OBR segments are identical <p>Otherwise, the order will be rejected.</p> <p>Note: The Quantum Hub does not require unique order numbers. The service provider is responsible for handling any duplicate order numbers that are received.</p>
02.01	Entity Identifier	R	ST			Must match 02.01 (Entity Identifier) or the order will be rejected.
02.02	Namespace ID	O	IS			
02.03	Universal ID	O	ST			
02.04	Universal ID Type	O	ID			
OBR.03	Filler Order Number	X				
OBR.04	Universal Service ID	R	CE	250	N	This is the identification code for the ordered test. One order code per OBR segment is allowed, formatted as:

Field	Name	Req'd	Type	Length	Repeat	Comments
						^^^local_order_code^description Note: The incoming order data is preserved for subsequent inclusion in matching result messages. For more information, see “ Store and forward ” on page 160.
04.01	Identifier	O	ST			
04.02	Text	O	ST			
04.03	Name of Coding System	O	ID			
04.04	Alternate Identifier	R	ST			This is the local_order_code.
04.05	Alternate Text	R	ST			This is the description.
04.06	Name of Alternate Coding System	O	ID			
OBR.05	Priority (OBR.27)	X				
OBR.06	Requested Date/time	X				
OBR.07	Observation Date/Time	R	TS	26	N	This is the specimen collection date and time. This field is formatted as: yyyymmddhhmm Note: For PSC Hold orders, client must be able to add a future collection date.
OBR.08	Observation End Date/Time	X				
OBR.09	Collection Volume	X				
OBR.10	Collector Identifier	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.11	Specimen Action Code	O	ID	1	N	This is the action to be taken with respect to the specimens that accompany or precede this order.
OBR.12	Danger Code	X				
OBR.13	Relevant Clinical Info.	X				
OBR.14	Specimen Received Date/Time	X				
OBR.15	Specimen Source	X				
OBR.16	Ordering Provider	R	XCN	250	Y	This is the provider who ordered the test (same as ORC.12).
16.01	ID Number	R	ST			This is the <code>NPI_number</code> .
16.02	Family Name	R	FN			This is the last name of the ordering provider.
16.01.01	Surname	O	ST			
16.01.02	Own Surname Prefix	O	ST			
16.01.03	Own Surname	R	ST			
16.01.04	Surname Prefix from Partner	O	ST			
16.01.05	Surname from Partner	O	ST			
16.03	Given Name	R	ST			This is the first name of the ordering provider.
16.04	Middle Initial or Name	O	ST			This is the middle initial or name of the ordering provider.
16.05	Suffix	O	ST			
16.06	Prefix	O	ST			
16.07	Degree (Deprecated)	X				
16.08	Source Table	O	ST			
16.09	Assigning Authority	R	HD			This is the <code>NPI</code> .

Field	Name	Req'd	Type	Length	Repeat	Comments
16.09.01	Namespace ID	0	IS			
16.09.02	Universal ID	0	ST			
16.09.03	Universal ID Type	0	ID			
16.10	Name Type Code	0	ID			
16.11	Identifier Check Digit	0	ST			
16.12	Code Identifying the Check Digit Scheme Employed	0	ID			
16.13	Identifier Type Code	0	IS			
16.14	Assigning Facility	0	HD			
16.14.01	Namespace ID	0	IS			
16.14.02	Universal ID	0	ST			
16.14.03	Universal ID Type	0	ID			
16.15	Name Representation Code	0	ID			
16.16	Name Context	0	CE			
16.16.01	Identifier	0	ST			
16.16.02	Text	0	ST			
16.16.03	Name of Coding System	0	ID			
16.16.04	Alternate Identifier	0	ST			
16.16.05	Alternate Text	0	ST			
16.16.06	Name of Alternate Coding System	0	ID			
16.17	Name Validity Range (Deprecated)	X				
16.18	Name Assembly Order	0	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
16.19	Effective Date	0	TS			
16.20	Expiration Date	0	TS			
16.21	Professional Suffix	0	ST			
16.22	Assigning Jurisdiction	0	CWE			
16.22.01	Identifier	0	ST			
16.22.02	Text	0	ST			
16.22.03	Name of Coding System	0	ID			
16.22.04	Alternate Identifier	0	ST			
16.22.05	Alternate Text	0	ST			
16.22.06	Name of Alternate Coding System	0	ID			
16.22.07	Coding System Version ID	0	ST			
16.22.08	Alternate Coding System Version ID	0	ST			
16.22.09	Original Text	0	ST			
16.23	Assigning Agency or Department	0	CWE			
16.23.01	Identifier	0	ST			
16.23.02	Text	0	ST			
16.23.03	Name of Coding System	0	ID			
16.23.04	Alternate Identifier	0	ST			
16.23.05	Alternate Text	0	ST			
16.23.06	Name of Alternate Coding System	0	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
16.23.07	Coding System Version ID	0	ST			
16.23.08	Alternate Coding System Version ID	0	ST			
16.23.09	Original Text	0	ST			
OBR.17	Order Callback Phone Number	X				
OBR.18	Placer Field 1	0	ST	2000	N	<p>If present, the Quantum Hub stores this information and returns it (as received) with the associated results.</p> <p>For each unique occurrence of OBR.04, the OBR.04 value is preserved along with the corresponding set of OBR.18 and OBR.19 values that are received in the order message. For more information, see “Store and forward” on page 216.</p>
OBR.19	Placer Field 2	0	ST	2000	N	<p>If present, the Quantum Hub stores this information and returns it (as received) with the associated results.</p> <p>For each unique occurrence of OBR.04, the OBR.04 value is preserved along with the corresponding set of OBR.18 and OBR.19 values that are received in the order message. For more information, see “Store and forward” on page 216.</p>
OBR.20	Filler Field 1	X				
OBR.21	Filler Field 2	X				
OBR.22	Results Rpt/Status Chng - Date/Time	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.23	Charge to Practice	X				
OBR.24	Diagnostic Serv Sect ID	X				
OBR.25	Result Status	X				
OBR.26	Parent Result	X				
OBR.27	Quantity/Timing	0	TQ	200	Y	
27.01	Quantity	0	CQ			
27.01.01	Quantity	0	NM			
27.01.02	Units	0	CE			
27.02	Interval	0	RI			
27.02.01	Repeat Pattern	0	IS			
27.02.02	Explicit Time Interval	0	ST			
27.03	Duration	0	ST			
27.04	Start Date Time	0	TS			
27.05	End Date Time	0	TS			
27.06	Priority	0	ST			The valid value for this field is: R (Routine).
27.07	Condition	0	ST			
27.08	Text	0	TX			
27.09	Conjunction	0	ID			
27.10	Order Sequencing	0	OSD			
27.10.01	Sequence or Results Flag	0	ID			
27.10.02	PON Entity Identifier	0	ST			
27.10.03	PON Namespace ID	0	IS			
27.10.04	FON Entity Identifier	0	ST			
27.10.05	FON Namespace ID	0	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
27.10.06	Sequence Condition Value	0	ST			
27.10.07	Maximum Num of Repeats	0	NM			
27.10.08	PON Universal ID	0	ST			
27.10.09	PON Universal ID Type	0	ID			
27.10.10	FON Universal ID	0	ST			
27.10.11	FON Universal ID Type	0	ID			
27.11	Occurrence Duration	0	CE			
27.11.01	Identifier	0	ST			
27.11.02	Text	0	ST			
27.11.03	Name of Coding System	0	ID			
27.11.04	Alternate Identifier	0	ST			
27.11.05	Alternate Text	0	ST			
27.11.06	Name of Alternate Coding System	0	ID			
27.12	Total Occurrences	0	NM			
OBR.28	Result Copies To	X				
OBR.29	Parent	X				
OBR.30	Transportation Mode	X				
OBR.31	Reason for Study	X				
OBR.32	Principal Result Interpreter	X				
OBR.33	Assistant Result Interpreter	X				
OBR.34	Technician	X				
OBR.35	Transcriptionist	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.36	Scheduled Date/Time	X				
OBR.37	Number of Sample Containers	X				
OBR.38	Transport Logistics of Collected Sample	X				
OBR.39	Collector's Comment	X				
OBR.40	Transport Arrangement Responsibility	X				
OBR.41	Transport Arranged	X				
OBR.42	Escort Required	X				
OBR.43	Planned Patient Transport Comment	X				
OBR.44	Procedure Code	X				
OBR.45	Procedure Code Modifier	X				
OBR.46	Placer Supplemental Service Information	X				
OBR.47	Filler Supplemental Service Information	X				
OBR.48	Medically Necessary Duplicate Procedure Reason	X				
OBR.49	Result Handling	X				
OBR.50	Parent Universal Service Identifier	X				

DG1—Diagnosis segment

The Diagnosis (DG1) segment contains patient diagnosis information.

Field	Name	Req'd	Type	Length	Repeat	Comments
DG1.00	Segment Type ID	R	ST	4	N	This field is DG1.
DG1.01	Set ID	R	SI	4	N	This field allows identification of multiple diagnosis segments grouped beneath a single OBR segment and is usually a sequential number beginning with 1.
DG1.02	Diagnosis Coding Method	X				
DG1.03	Diagnosis Code	C	CE	250	N	This field contains the ICD-10 diagnosis code and diagnosis description, and is required if IN1.47 (Coverage Type) is P or T.
03.01	Identifier	R	ST			This is the ICD code, such as J30.1.
03.02	Text	R	ST			This is the ICD_description, such as Allergic rhinitis due to pollen.
03.03	Name of Coding System	R	ID			This is the coding system's name, such as I10 for the ICD-10 system.
03.04	Alternate Identifier	R	ST			
03.05	Alternate Text	X				
03.06	Name of Alternate Coding System	X				
DG1.04	Diagnosis Description	X				
DG1.05	Diagnosis Date/Time	X				
DG1.06	Diagnosis Type	X				
DG1.07	Major Diagnostic Category	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
DG1.08	Diagnostic Related Group	X				
DG1.09	DRG Approval Indicator	X				
DG1.10	DRG Grouper Review Code	X				
DG1.11	Outlier Type	X				
DG1.12	Outlier Days	X				
DG1.13	Outlier Cost	X				
DG1.14	Grouper Version and Type	X				
DG1.15	Diagnosis Priority	X				
DG1.16	Diagnosing Clinician	X				
DG1.17	Diagnosis Classification	X				
DG1.18	Confidential Indicator	X				
DG1.19	Attestation Date/Time	X				
DG1.20	Diagnosis Identifier	X				
DG1.21	Diagnosis Action Code	X				

OBX—Observation/Result segment

This segment is optional. AOE's in the order are typically captured as OBX segments.

Field	Name	Req'd	Type	Length	Repeat	Comments
OBX.00	Segment Type ID	R	ST	10	N	This field is OBX .
OBX.01	Set ID	R	SI	10	N	This is the sequence number for OBX segments grouped beneath the same OBR segment.

Field	Name	Req'd	Type	Length	Repeat	Comments
OBX.02	Value Type	O	ID	2	N	This defines the structure of the <i>Observation Value (OBX.05)</i> . Valid values for this field are: <ul style="list-style-type: none"> • ST: String data • NM: Numeric data • CE: Coding elements • TX: Text data
OBX.03	Observation Identifier	R	CE	590	N	This field contains a value that reports the results for an AOE.
03.01	Identifier	O	ST			
03.02	Text	O	ST			
03.03	Name of Coding System	O	ID			
03.04	Alternate Identifier	R	ST			This is the <code>local_code</code> .
03.05	Alternate Text	R	ST			This is the <code>description</code> .
03.06	Name of Alternate Coding System	O	ID			
OBX.04	Observation Sub-ID	X				
OBX.05	Observation Value	R	*	99999	Y/2	This field contains an answer to an AOE question. The asterisk (*) indicates that the data type is dependent on the selection in OBX.02 .
OBX.06	Units	X				
OBX.07	References Range	X				
OBX.08	Abnormal Flags	X				
OBX.09	Probability	X				
OBX.10	Nature of Abnormal Test	X				
OBX.11	Observ Result Status	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBX.12	Effective Date of Reference Range Values	X				
OBX.13	User Defined Access Checks	X				
OBX.14	Date/Time of the Observation	X				
OBX.15	Producer's Reference	X				
OBX.16	Responsible Observer	X				
OBX.17	Observation Method	X				
OBX.18	Equipment Instance Identifier	X				
OBX.19	Date/Time of the Analysis	X				
OBX.20	Reserved for harmonization with V2.6	X				
OBX.21	Reserved for harmonization with V2.6	X				
OBX.22	Reserved for harmonization with V2.6	X				
OBX.23	Performing Organization Name	X				
OBX.24	Performing Organization Address	X				
OBX.25	Performing Organization Medical Director	X				

NTE—Notes and Comments segment

The Notes and Comments (NTE) segment contains notes and comments for OML messages and is optional.

Field	Name	Req'd	Type	Length	Repeat	Comments
NTE.00	Segment Type ID	R	ST	4	N	This field is NTE.
NTE.01	Set ID	R	SI	4	N	This field may be used to group multiple NTE segments in a message.
NTE.02	Source of Comment	O	ID	8	N	Valid values for this field are: <ul style="list-style-type: none"> • I: Internal comments. A value of I identifies the data in NTE.03 as internal comments that will not be returned with the result. (For normal orders, limit is 5 lines of 60 characters each. For PSC Hold orders, only the first 60 characters will be read) • R: Report comments. A value of R identifies the data in NTE.03 as report comments that will be returned with the result. (For normal orders, limit is 2 lines of 60 characters each. For PSC Hold orders, only the first 60 characters will be read) • L: The ancillary (filler) department is the source of the comment • P = The orderer (placer) is the source of the comment. • O: Another system is the source of the comment
NTE.03	Comment	R	ST	65536	Y	Comments can use the following escape sequences to represent the reserved characters: <ul style="list-style-type: none"> • \F\ field separator: • \S\ component separator: ^ • \T\ subcomponent separator: & • \R\ repetition separator: ~ • \E\ escape character: \

Field	Name	Req'd	Type	Length	Repeat	Comments
						<p>Comments can also use the following embedded hexadecimal control characters to represent a line terminator:</p> <ul style="list-style-type: none"> • \X0A\ or \x0a\: CR (carriage return) • \X0D\ or \x0d\: LF (line feed) <p>The hexadecimal characters are not case-sensitive. They can be submitted individually and as a pair (\X0D\ \X0A\), but no other hexadecimal representation (for example, 2AF3) will be accepted.</p> <p>To represent new lines in the NTE segment, do 1 of the following:</p> <ul style="list-style-type: none"> • Use the hexadecimal CR and LF characters, or • Put each new line in a unique NTE segment <p>See the examples following this table.</p>
NTE.04	Comment Type	X				

Comment examples

Example with new lines using hexadecimal control characters:

```
NTE|1|I|FAX TO:DR. FIRSTNAME LASTNAME FAX #513-111-2222\X0D\ \X0A\
NTE|2|I|1234 MAIN STREET #300\X0D\ \X0A\MASON, OH 45010
```

Example with new lines using unique NTE segments:

```
NTE|1|I|FAX TO:DR. FIRSTNAME LASTNAME FAX #513-111-2222
NTE|2|I|1234 MAIN STREET #300
NTE|3|I|MASON, OH 45010
```

In printed form, the information for both of these examples would appear as follows:

```
FAX TO:DR. FIRSTNAME LASTNAME FAX #513-111-2222
1234 MAIN STREET #300
MASON, OH 45010
```

Sample order HL7 2.5.1 message

The following are sample OML messages, formatted according to the “Order HL7 2.5.1 message format requirements” on page 213 and “Order HL7 2.5.1 message segment specifications” on page 218.

Sample order message

```
MSH|^~\&||Sending Application||Sending Facility|202412091132|
|OML^O21|123456789AaBbCcDdEe|D|2.5.1
PID||123456789|123456789||Lastname^Firstname||19651109|M
PV1||A
IN1|1||InsureCo||||||||||||||||||||||||||||||||||||P
GT1|1||Guarantorlast^Guarantorfirst||Guarantor Address
ORC|NW|987654321
TQ1|1|1|Once||||199602171830||S
OBR|1|987654321||^10124^CARDIO CRP||20241209021810
DG1|1||I25700^Atherosclerosis of CABG, unsp, w unstable angina pectoris^ICD
OBX||^A123^Some observation||||P
NTE|1|I|FAX TO:DR. FIRSTNAME LASTNAME AT 513-111-2222\X0D\\X0A\
NTE|2|I|1234 MAIN STREET #300\X0D\\X0A\MASON, OH 45010
```

Sample PSC Hold order message

The following sample order message shows a PSC Hold order, as designated by PSC in MSH.05. In addition, this sample message shows an insurance (IN1) segment for client billing, as designated by P in IN1.47. No guarantor (GT1) segment is included in the message because the GT1 segment is required only for third-party billing.

```
MSH|^~\&|HUBWS|46355|PSC|DAL|202412091132||OML^O21|123456789AaBbCcDdEe|P|2.5.1|
PID|1||CHART^^^CID~MEDICAL ^^MRN||PTLASTNAME^PTFIRSTNAME^||19750825|F||10 PARKWAY
DRIVE^^MASON^OH^45040||^716^5550174||||999654321||
IN1|1||||||||||||||||||||||||||||||||P
ORC|NW|12||||1234567893^DRLASTNAME^DRFIRSTNAME^M.^^^NPI|||
OBR|1|12||^483^GLUCOSE|||
20241209104500||||1234567893^DRLASTNAME^DRFIRSTNAME^M.^^^N
NPI|||||
DG1|1|ICD|I25700|Atherosclerosis of CABG, unsp, w unstable angina pectoris
```

Chapter 9: Retrieve Test Compendium web service API reference

In this chapter:

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- Best practices for using the Retrieve Test Compendium web service 282
- Retrieve Test Compendium web service methods 283
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About the Retrieve Test Compendium web service

This chapter provides details about the Retrieve Test Compendium for JAX-RS (REST) web service provided by Quatum Hub. The Retrieve Test Compendium web service complies with the Java API for RESTful Web Services (JAX-RS 2.0) specification (JSR-311), and provides operations for the request, retrieval, and acknowledgment of Quest Diagnostics test compendium files.

Test compendium files contain all reference data—for example, test codes, diagnostic codes, and Ask on Order Entry (AOE) questions—needed by an EMR or EHR to create a complete and valid electronic order for Quest laboratory systems. Test compendium files can be retrieved as either a full set (a complete set of files that replace the existing test compendium) or an incremental set (1 or more updated files that contain additions, deactivations, and/or updates to the existing test compendium files).

The following test compendium types are supported by the Retrieve Test Compendium web service:

- **Clinical Data Compendium (CDC).** The test compendium files in Order Entry Rules Database (OERDB) text file format. For details, see [Chapter 10, “Clinical Data Compendium” beginning on page 299](#)
- **Electronic Exchange of Directory of Services (eDOS).** The test compendium files in HL7 2.6 message format. (eDOS is the preferred format for the Quest Diagnostics test compendium.) For details, see [Chapter 11, “eDOS laboratory test compendium framework” beginning on page 332](#)

Notes:

- CDC and eDOS data files are stored in the Quatum Hub for 90 days, regardless of whether or not they have been retrieved and/or acknowledged
- You can also (optionally) retrieve the CDC or eDOS files using a WebDAV client. For details, see [“Retrieving CDC dataset files via WebDAV” on page 330](#) or [“Retrieving eDOS Files via WebDAV” on page 370](#)

Your Quest credentials are required to access this web service.

Best practices for using the Retrieve Test Compendium web service

This section describes the best practices that you should follow when creating a client application to interact with the Retrieve Test Compendium web service. Following these best practices will help minimize any technical or performance issues that might otherwise result from invalid or inappropriate use of the web service.

- **Automated test compendium retrieval.** You can automate the retrieval of test compendium files to ensure that you always have the newest order code sets that are available. Automated retrieval can be used for both eDOS and CDC test compendium files, and it supports both full and incremental updates. It is recommended that you request test compendium files no more than once per day. Always retrieve and acknowledge all test compendium files before submitting a new request on subsequent days
- **On-demand test compendium retrieval.** Typically, you will not need to retrieve specific test compendium files on demand. However, if the need arises, you can submit an on-demand request for a **full replacement set** of either CDC or eDOS test compendium files. You can either retrieve test compendium files for all Quest labs configured for your account, or for a specific lab

Notes:

- On-demand retrieval of **incremental** CDC files is not supported; you can only retrieve a full file set
- If you specify a file type (*CDC* or *eDOS*) or a lab that is not configured for your account, you will receive an error

For details on the above methods for retrieving test compendium files, see [“requestCompendiums” on the next page](#).

Retrieve Test Compendium web service methods

This section provides details on the methods and parameters provided by the Retrieve Test Compendium web service API. Retrieve Test Compendium methods include the following:

- “requestCompendiums” below
- “retrieveCompendium” on page 286
- “ackCompendium” on page 288

requestCompendiums

The requestCompendiums method allows you to request *eDOS* and/or *CDC* test compendium files in 1 of the following 2 ways:

- **Automated retrieval.** On a regular basis, you can request the list of **all** test compendium files that are available for download based on your account configuration, which can include full replacement and/or incremental replacement files for the *CDC* and/or *eDOS* test compendiums. The response provides a list of all test compendium files that are either new, or that have been previously notified but not yet been acknowledged (by sending an ACK message)
- **On-demand retrieval.** As needed, you can submit an on-demand request for a **full replacement set** of either *CDC* or *eDOS* test compendium files. You can retrieve test compendium files of the specified type for all Quest Diagnostics labs (also called *business units*) configured for your account, or for a specific lab

Notes:

- On-demand retrieval of **incremental** *CDC* files is not supported; you can only retrieve a full file set
- If you specify a file type (*CDC* or *eDOS*) or a lab/business unit that is not configured for your account, you will receive an error

The response from the [requestCompendiums](#) method includes a predefined link for retrieving as well as for acknowledging (sending an ACK message for) each available file.

Endpoint

You must use the HTTP GET method to submit the request to the endpoint shown below, where:

- `domain` specifies the Quantum Hub environment
- `type` is an optional parameter that specifies the file type
- `BU` is an optional parameter that specifies the desired lab

For the complete uniform resource identifier (URIs) for each of the Quantum Hub environments, see “[Retrieve Test Compendium web service endpoints](#)” on page 297.

Endpoint type	Endpoint address
Automated retrieval endpoint	GET <code>https://domain/hub-resource-server/oauth2/compendium/requestCompendiums</code>
On-demand retrieval endpoint	GET <code>https://domain/hub-resource-server/oauth2/compendium/requestCompendiums/type[?BU=BU]</code>

Request specifications

This is the test compendium file request, which can be either:

- **Automated retrieval.** Omit the *type* value (CDC or eDOS) to request **all** available files, including both full and incremental updates
- **On-demand retrieval.** Specify the desired file type by appending the *type* value (CDC or eDOS) to the request URI, and either specify a lab, or omit the [*?BU=BU*] parameter to request **all** BUs for the specified type

Note: See “Request Parameter Descriptions” below for supported *type* and *BU* values.

The request is formatted as text/plain and uses a path/message body string.

Automated retrieval example:

```
.../hub-resource-server/oauth2/compendium/requestCompendiums
```

On-demand retrieval examples:

```
.../hub-resource-server/oauth2/compendium/requestCompendiums/eDOS
```

```
.../hub-resource-server/oauth2/compendium/requestCompendiums/CDC?BU=TMP
```

Request Parameter Descriptions

Parameter	Data type	Req'd ^a	Description/attributes
type	String	C	The file type for an on-demand request. Options include: <ul style="list-style-type: none">• eDOS. Return a list of all available eDOS full replacement files• CDC. Return a list of all available CDC full replacement files Note: The type must be specified when submitting an on-demand retrieval request for a specific lab (BU).
BU	String	C	The specific lab for an on-demand request. Options include: <ul style="list-style-type: none">• <Omit parameter>. Return a complete file set of the specified type (CDC or eDOS) for all labs configured for the account by omitting the [<i>?BU=BU</i>] parameter• BU. Return a complete file set of the specified type (CDC or eDOS) for the specified lab

Response specifications

The requested test compendium file list. For each available file, the response includes the following:

- The file name
- A predefined link for retrieving the file
- A predefined link for acknowledging the receipt of the file
- A transaction ID

The response is formatted as application/json.

^aR = Required, O = Optional, C = Conditional.

Example:

```

{
  transactionId: string
  fullFileLinks:
  [{
    fileName: string
    retrieveURI: string
    ackURI: string
    relatedTransactionId: string
  }]
  deltaFileLinks:
  [{
    fileName:
    fileName: string
    retrieveURI:
    fileName: string
    ackURI:
    fileName: string
    relatedTransactionId: string
  }]
  errorMessage: string
  previouslyNotifiedDeltasLinks:
  [{
    fileName: string
    retrieveURI: string
    ackURI: string
    relatedTransactionId: string
  }]
  previouslyNotifiedFullFileLinks:
  [ {
    fileName: string
    retrieveURI: string
    ackURI: string
    relatedTransactionId: string
  } ]
}

```

Response Parameter Descriptions

Parameter	Data type	Req'd ^a	Description/attributes
transactionId	String	R	The Quantum Hub transaction ID for the overall request.
fullFileLinks	fullFileLinks[]	0	The array of links for retrieving any full file sets that are available.
deltaFileLinks	deltaFileLinks[]	0	The array of links for retrieving any incremental file sets that are available.

^aR = Required, 0 = Optional, C = Conditional.

Parameter	Data type	Req'd ^a	Description/attributes
previouslyNotifiedDeltasLinks	previouslyNotified DeltasLinks[]	O	The array of links for retrieving any prior incremental file sets that have not yet been acknowledged (ACK'd).
previouslyNotifiedFullFileLinks	previouslyNotified FullFileLinks[]	O	The array of links for retrieving any prior full file sets that have not yet have been acknowledged (ACK'd).
fileName	String	R	The name of the test compendium file.
retrieveURI	String	R	The predefined link for retrieving the test compendium file.
ackURI	String	R	The predefined link for acknowledging the test compendium file.
relatedTransactionId	String	R	The Quantum Hub transaction ID for the specific test compendium file.
errorMessage	String	O	The error message, if an error occurs.

HTTP Response Codes

The following table lists the possible HTTP response codes for the [requestCompendiums](#) method.

Note: Specific information is included with the HTTP response code.

Response code	Description
200	The request was completed successfully.
400	The request was not properly constructed.
401	The user credentials were not authorized.
403	The user does not have permission for the Retrieve Test Compendium service.
404	The requested endpoint was not found.
500	An internal server error occurred.

retrieveCompendium

The `retrieveCompendium` method allows you to retrieve a specific test compendium file (either *CDC* or *eDOS*) from the list of available files returned by the [requestCompendiums](#) method.

^aR = Required, O = Optional, C = Conditional.

Endpoint

You must use the HTTP GET method to submit the request to the endpoint shown below, where:

- `domain` specifies the Quantum Hub environment
- `transactionUID` specifies the transaction ID returned in the [requestCompendiums](#) response
- `fileName` specifies the name of the test compendium file

For the complete uniform resource identifier (URIs) for each of the Quantum Hub environments, see [“Retrieve Test Compendium web service endpoints” on page 297](#).

Endpoint address

GET `https://domain/hub-resource-server/oauth2/compendium/retrieveCompendium/transactionUID/fileName`

Request specifications

This is the retrieval request for a specific test compendium file.

Specify the desired file by appending the *transactionUID* and *fileName* to the request URI.

Note: See [“Request Parameter Descriptions” below](#) for supported values.

The request is formatted as text/plain and uses a path/message body string.

Example:

```
.../hub-resource-server/oauth2/compendium/retrieveCompendium/befc9d117f000101196a2aa3c8b3a695/MIA_CDC_FULL_V1.zip
```

Request Parameter Descriptions

Parameter	Data type	Req'd ^a	Description/attributes
<code>transactionUID</code>	String	R	The <i>relatedTransactionId</i> value returned in the requestCompendiums response for the desired test compendium file.
<code>fileName</code>	String	R	The <i>fileName</i> value returned in the requestCompendiums response for the desired test compendium file.

Response specifications

This is the requested test compendium file, streamed in compressed (.zip) format.

There are no applicable response parameters.

HTTP Response Codes

The following table lists the possible HTTP response codes for the [retrieveCompendium](#) method.

Note: Specific information is included with the HTTP response code.

^aR = Required, O = Optional, C = Conditional.

Response code	Description
200	The request was completed successfully.
400	The request was not properly constructed.
401	The user credentials were not authorized.
403	The user does not have permission for the Retrieve Test Compendium service.
404	The requested endpoint was not found.
500	An internal server error occurred.

ackCompendium

The `ackCompendium` method allows you to acknowledge (ACK) the receipt of a specific test compendium file, from the list returned by the `requestCompendiums` method.

Endpoint

You must use the HTTP GET method to submit the request to the endpoint shown below, where:

- `domain` specifies the Quantum Hub environment
- `transactionUID` specifies the transaction ID returned in the `requestCompendium` response
- `fileName` specifies the name of the test compendium file

For the complete uniform resource identifier (URIs) for each of the Quantum Hub environments, see “Retrieve Test Compendium web service endpoints” on page 297.

Endpoint address

```
GET https://domain/hub-resource-
server/oauth2/compendium/ackCompendium/transactionUID/fileName
```

Request specifications

This is the file retrieval acknowledgment.

Specify the desired file by appending the `transactionUID` and `fileName` to the ACK URI.

Note: See “Request Parameter Descriptions” on the next page for supported values.

The request is formatted as text/plain and uses a path/message body string.

Example:

```
.../hub-resource-
server/oauth2/compendium/ackCompendium/befc9d117f000101196a2aa3c8b3a695/MIA_CDC_
FULL_V1.zip
```

Request Parameter Descriptions

Parameter	Data type	Req'd ^a	Description/attributes
transactionUID	String	R	The <i>relatedTransactionId</i> value returned in the requestCompendiums response for the desired test compendium file.
fileName	String	R	The <i>fileName</i> value returned in the requestCompendiums response for the desired test compendium file.

Response specifications

This is the acknowledgement (ACK) response, which echoes the submitted `transactionUID` and `fileName` values, as well as the status.

The response is formatted as `application/json`.

Example:

```
{
  transactionId: string
  fileName: string
  status: string
  errorMessage: string
}
```

Response parameter descriptions

Parameter	Data type	Req'd ^b	Description/attributes
transactionId	String	R	The transaction ID submitted in the retrieveCompendium request.
fileName	String	R	The file name submitted in the retrieveCompendium request.
status	String	R	The status of the acknowledgment (ACK). Valid values are <code>SUCCESS</code> or <code>ERROR</code> .
errorMessage	String	O	The error message, if an error occurs.

^aR = Required, O = Optional, C = Conditional.

^bR = Required, O = Optional, C = Conditional.

HTTP Response Codes

The following table lists the possible HTTP response codes for the [ackCompendium](#) method.

Note: Specific information is included with the HTTP response code.

Response code	Indicates
200	The request was completed successfully.
400	The request was not properly constructed.
401	The user credentials were not authorized.
403	The user does not have permission for the Retrieve Test Compendium service.
404	The requested endpoint was not found.
500	An internal server error occurred.

Sample Retrieve Test Compendium request and response

This section provides sample requests and responses for the Retrieve Test Compendium RESTful web service.

requestCompendiums requests and responses

The following are sample `requestCompendiums` request and response messages. For details on the `requestCompendiums` method, see “Retrieve Test Compendium web service methods” on page 283.

requestCompendiums automated request

`https://domain/hub-resource-server/oauth2/compendium/requestCompendiums`

requestCompendiums automated responses

Sample 1: Full and incremental files are available for download.

```
{
  "transactionId":"3ec634487f00010119927e5c701a5cdd",
  "fullFileLinks":
  [
    {
      "relatedTransactionId":"3ec634487f00010119927e5c701a5cdd",
      "fileName":"AMD_CDC_FULL_20151006_152505376.zip",
      "retrieveURI":"/hub-resource-
server/oauth2/compendium/retrieveCompendium/3ec634487f00010119927e5c701a5cdd/AM
D_CDC_FULL_20151006_152505376.zip",
      "ackURI":"/hub-resource-
server/oauth2/compendium/ackCompendium/3ec634487f00010119927e5c701a5cdd/AMD_
CDC_FULL_20151006_152505376.zip"
    },
    {
      "relatedTransactionId":"3ec634487f00010119927e5c701a5cdd",
      "fileName":"MET_CDC_FULL_20151006_152519822.zip",
      "retrieveURI":"/hub-resource-
server/oauth2/compendium/retrieveCompendium/3ec634487f00010119927e5c701a5cdd/ME
T_CDC_FULL_20151006_152519822.zip",
      "ackURI":"/hub-resource-
server/oauth2/compendium/ackCompendium/3ec634487f00010119927e5c701a5cdd/MET_
CDC_FULL_20151006_152519822.zip"
    },
    {
      "relatedTransactionId":"3ec634487f00010119927e5c701a5cdd",
      "fileName":"MIA_CDC_FULL_20151006_152535073.zip",
      "retrieveURI":"/hub-resource-
server/oauth2/compendium/retrieveCompendium/3ec634487f00010119927e5c701a5cdd/MI
A_CDC_FULL_20151006_152535073.zip",
      "ackURI":"/hub-resource-
server/oauth2/compendium/ackCompendium/3ec634487f00010119927e5c701a5cdd/MIA_
CDC_FULL_20151006_152535073.zip"
    }
  ],
  "deltaFileLinks":
  [
    {
      "relatedTransactionId":"3ec634487f00010119927e5c701a5cdd",
      "fileName":"Delta_cdc_MIA_20151006152505376.zip",
```

```

"retrieveURI":"/hub-resource-
server/oauth2/compendium/retrieveCompendium/3ec634487f00010119927e5c701a5cdd/Delta_cdc_MIA_20151006152505376.zip",
"ackURI":"/hub-resource-
server/oauth2/compendium/ackCompendium/3ec634487f00010119927e5c701a5cdd/Delta_cdc_MIA_20151006152505376.zip"
},
{
"relatedTransactionId":"3ec634487f00010119927e5c701a5cdd",
"fileName":"Delta_eDos_TMP_20151006152505376.zip",
"retrieveURI":"/hub-resource-
server/oauth2/compendium/retrieveCompendium/3ec634487f00010119927e5c701a5cdd/Delta_eDos_TMP_20151006152505376.zip",
"ackURI":"/hub-resource-
server/oauth2/compendium/ackCompendium/3ec634487f00010119927e5c701a5cdd/Delta_eDos_TMP_20151006152505376.zip"
}
],
"previouslyNotifiedDeltasLinks":null,
"previouslyNotifiedFullFileLinks":null,
"errorMessage":null
}

```

Sample 2: Previously notified full and incremental files (notified files that have not been ACK) are available for download.

```

{
"transactionId":"d2d63afdac1262891ca7075d41c8dac5",
"fullFileLinks":null,
"deltaFileLinks":null,
"previouslyNotifiedDeltasLinks":[
{
"relatedTransactionId":"3ec634487f00010119927e5c701a5cdd",
"fileName":"Delta_cdc_MIA_20151006152505376.zip",
"retrieveURI":"/hub-resource-
server/oauth2/compendium/retrieveCompendium/3ec634487f00010119927e5c701a5cdd/Delta_cdc_MIA_20151006152505376.zip",
"ackURI":"/hub-resource-
server/oauth2/compendium/ackCompendium/3ec634487f00010119927e5c701a5cdd/Delta_cdc_MIA_20151006152505376.zip"
}
],
{
"relatedTransactionId":"3ec634487f00010119927e5c701a5cdd",
"fileName":"Delta_eDos_TMP_20151006152505376.zip",
"retrieveURI":"/hub-resource-
server/oauth2/compendium/retrieveCompendium/3ec634487f00010119927e5c701a5cdd/Delta_eDos_TMP_20151006152505376.zip",
"ackURI":"/hub-resource-
server/oauth2/compendium/ackCompendium/3ec634487f00010119927e5c701a5cdd/Delta_eDos_TMP_20151006152505376.zip"
}
}],
"previouslyNotifiedFullFileLinks":
[
{
"relatedTransactionId":"3ec634487f00010119927e5c701a5cdd",
"fileName":"AMD_CDC_FULL_20151006_152505376.zip",
"retrieveURI":"/hub-resource-
server/oauth2/compendium/retrieveCompendium/3ec634487f00010119927e5c701a5cdd/AMD_CDC_FULL_20151006_152505376.zip",

```

```

    "ackURI":"/hub-resource-
server/oauth2/compendium/ackCompendium/3ec634487f00010119927e5c701a5cdd/AMD_
CDC_FULLL_20151006_152505376.zip"
  },
  {
    "relatedTransactionId":"3ec634487f00010119927e5c701a5cdd",
    "fileName":"MET_CDC_FULLL_20151006_152519822.zip",
    "retrieveURI":"/hub-resource-
server/oauth2/compendium/retrieveCompendium/3ec634487f00010119927e5c701a5cdd/ME
T_CDC_FULLL_20151006_152519822.zip",
    "ackURI":"/hub-resource-
server/oauth2/compendium/ackCompendium/3ec634487f00010119927e5c701a5cdd/MET_
CDC_FULLL_20151006_152519822.zip"
  },
  {
    "relatedTransactionId":"3ec634487f00010119927e5c701a5cdd",
    "fileName":"MIA_CDC_FULLL_20151006_152535073.zip",
    "retrieveURI":"/hub-resource-
server/oauth2/compendium/retrieveCompendium/3ec634487f00010119927e5c701a5cdd/MI
A_CDC_FULLL_20151006_152535073.zip",
    "ackURI":"/hub-resource-
server/oauth2/compendium/ackCompendium/3ec634487f00010119927e5c701a5cdd/MIA_
CDC_FULLL_20151006_152535073.zip"
  }
],
"errorMessage":null
}

```

Sample 3: No new or previously downloaded files available to download.

```

{
  "transactionId":"d30c8a2aac1262891d9e4dc0a5e95dc3",
  "fullFileLinks":null,
  "deltaFileLinks":null,
  "previouslyNotifiedDeltasLinks":null,
  "previouslyNotifiedFullFileLinks":null,
  "errorMessage":"No test compendiums files"
}

```

requestCompendiums on-demand request—All eDOS labs

<https://domain/hub-resource-server/oauth2/compendium/requestCompendiums/eDOS>

requestCompendiums on-demand request—All eDOS labs

```
{
  "transactionId" : "b6d961b2ac1262891df50642e278a08a",
  "fullFileLinks" : [ {
    "relatedTransactionId" : "b6d961b2ac1262891df50642e278a08a",
    "fileName" : "AMD_EDOS_FULL_V33.zip",
    "retrieveURI" : "/hub-resource-server-
/oauth2/compendium/retrieveCompendium/b6d961b2ac1262891df50642e278a08a
/AMD_EDOS_FULL_V33.zip",
    "ackURI" : "/hub-resource-server-
/oauth2/compendium/ackCompendium/b6d961b2ac1262891df50642e278a08a
/AMD_EDOS_FULL_V33.zip"
  }, {
    "relatedTransactionId" : "b6d961b2ac1262891df50642e278a08a",
    "fileName" : "MIA_EDOS_FULL_V34.zip",
    "retrieveURI" : "/hub-resource-server-
/oauth2/compendium/retrieveCompendium/b6d961b2ac1262891df50642e278a08a
/MIA_EDOS_FULL_V34.zip",
    "ackURI" : "/hub-resource-server-
/oauth2/compendium/ackCompendium/b6d961b2ac1262891df50642e278a08a
/MIA_EDOS_FULL_V34.zip"
  }, {
    "relatedTransactionId" : "b6d961b2ac1262891df50642e278a08a",
    "fileName" : "FDX_EDOS_FULL_V30.zip",
    "retrieveURI" : "/hub-resource-server-
/oauth2/compendium/retrieveCompendium/b6d961b2ac1262891df50642e278a08a
/FDX_EDOS_FULL_V30.zip",
    "ackURI" : "/hub-resource-server-
/oauth2/compendium/ackCompendium/b6d961b2ac1262891df50642e278a08a
/FDX_EDOS_FULL_V30.zip"
  }, {
    "relatedTransactionId" : "b6d961b2ac1262891df50642e278a08a",
    "fileName" : "QUL_EDOS_FULL_V35.zip",
    "retrieveURI" : "/hub-resource-server-
/oauth2/compendium/retrieveCompendium/b6d961b2ac1262891df50642e278a08a
/QUL_EDOS_FULL_V35.zip",
    "ackURI" : "/hub-resource-server-
/oauth2/compendium/ackCompendium/b6d961b2ac1262891df50642e278a08a
/QUL_EDOS_FULL_V35.zip"
  } ],
  "deltaFileLinks" : null,
  "previouslyNotifiedDeltasLinks" : null,
  "previouslyNotifiedFullFileLinks" : null,
  "errorMessage" : null
}
```

requestCompendiums on-demand request—Specific lab

`https://domain/hub-resource-server/oauth2/compendium/requestCompendiums/eDOS?BU=MIA`

requestCompendiums on-demand request—Specific lab

```
{
  "transactionId" : "b6d6660a7f0001011bd68245817eb2a8",
  "fullFileLinks" : [ {
    "relatedTransactionId" : "b6d6660a7f0001011bd68245817eb2a8",
    "fileName" : "MIA_EDOS_FULL_V34.zip",
    "retrieveURI" : "/hub-resource-server-
/oauth2/compendium/retrieveCompendium/b6d6660a7f0001011bd68245817eb2a8
/MIA_EDOS_FULL_V34.zip",
    "ackURI" : "/hub-resource-server-
/oauth2/compendium/ackCompendium/b6d6660a7f0001011bd68245817eb2a8
/MIA_EDOS_FULL_V34.zip"
  } ],
  "deltaFileLinks" : null,
  "previouslyNotifiedDeltasLinks" : null,
  "previouslyNotifiedFullFileLinks" : null,
  "errorMessage" : null
}
```

retrieveCompendium request and response

The following are sample [retrieveCompendium](#) request and response messages. For details on the [retrieveCompendium](#) method, see “Retrieve Test Compendium web service methods” on page 283.

retrieveCompendium request

```
https://domain/hub-resource-server-
/oauth2/compendium/retrieveCompendium/bf0abdfd7f0001011a328417b3222b77
/MIA_CDC_FULL_V1.zip
```

retrieveCompendium response

The requested test compendium file streamed in compressed (.zip) format.

ackCompendium request and response

The following are sample [ackCompendium](#) request and response messages. For details on the [ackCompendium](#) method, see “Retrieve Test Compendium web service methods” on page 283.

ackCompendium request

```
https://domain/hub-resource-server-
/oauth2/compendium/ackCompendium/bf0abdfd7f0001011a328417b3222b77
/MIA_CDC_FULL_V1.zip
```

ackCompendium response

```
{  
  "transactionId": "bf0abdfd7f0001011a328417b3222b77",  
  "fileName": "MIA_CDC_FULL_V1.zip",  
  "status": "SUCCESS",  
  "errorMessage": null  
}
```

Retrieve Test Compendium web service endpoints

Your client application can access the Retrieve Test Compendium web service via the endpoints provided in this section. There is a unique endpoint for each method, as well as for each of the following Quantum Hub environments:

- **Certification.** Use this environment for developing, testing, and certifying your client application. For the Certification environment endpoint, see “[Certification environment](#)” below
- **Production.** Use this environment after your client application has been certified. For the Production environment endpoint, see “[Production environment](#)” below

Note: Your Quest credentials are required in order to access each endpoint. For the Production environment, credentials are issued once your client application has been developed, tested, and certified.

Certification environment

To access the Retrieve Test Compendium web service in the Certification environment, use the following link:

requestCompendium endpoint

<https://certhubservices.quantum.com/hub-resource-server/oauth2/compendium/requestCompendiums>
[https://certhubservices.quantum.com/hub-resource-server/oauth2/compendium/requestCompendiums/type\[?BU=BU\]](https://certhubservices.quantum.com/hub-resource-server/oauth2/compendium/requestCompendiums/type[?BU=BU])

retrieveCompendium endpoint

<https://certhubservices.quantum.com/hub-resource-server/oauth2/compendium/retrieveCompendium/transactionUID/fileName>

ackCompendium endpoint

<https://certhubservices.quantum.com/hub-resource-server/oauth2/compendium/ackCompendium/transactionUID/fileName>

Production environment

Once you have developed, tested, and certified your client application in the Certification environment, you can then update the application to work in the Production environment. Connecting a client application to the Production environment is similar to connecting to the Certification environment (the exposed interfaces are equivalent).

Note: Client applications developed against the Certification environment Web Application Description Language (WADL) can also be used to access the Production environment, and vice versa.

To access the Retrieve Test Compendium web service in the Production environment, use the following links:

requestCompendium endpoint

<https://hubservices.quantum.com/hub-resource-server/oauth2/compendium/requestCompendiums>
[https://hubservices.quantum.com/hub-resource-server/oauth2/compendium/requestCompendiums/type\[?BU=BU\]](https://hubservices.quantum.com/hub-resource-server/oauth2/compendium/requestCompendiums/type[?BU=BU])

retrieveCompendium endpoint

<https://hubservices.quantum.com/hub-resource-server/oauth2/compendium/retrieveCompendium/transactionUID/fileName>

ackCompendium endpoint

<https://hubservices.quantum.com/hub-resource-server/oauth2/compendium/ackCompendium/transactionUID/fileName>

Chapter 10: Clinical Data Compendium

In this chapter:

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About the Clinical Data Compendium

This chapter provides an overview and detailed specifications for the *Clinical Data Compendium* (CDC) service. The CDC is a current collection of all reference data—for example, test codes, diagnostics codes, and Ask on Order Entry (AOE) questions—needed to create a complete and valid electronic order for Quest Diagnostics laboratory systems. The CDC helps to improve overall patient care by avoiding potential testing delays and minimizing specimen recollection.

The Quantum Hub enables the automated delivery of this critical data for Quest labs and business units (BUs) and other EMR vendors, in order to improve operational efficiencies and overall customer care. You can retrieve CDC file updates using Web-based Distributed Authoring and Versioning (WebDAV). For details, see [“Retrieving CDC dataset files via WebDAV” on page 330](#).

Always replace your existing CDC files with the new CDC files you download. This helps to ensure that your EMR/EHR applications are always using the most recent and accurate order entry information available so that valid orders are being sent to Quest for processing.

Note: A new format for the lab reference data is available via *Electronic Exchange of Directory of Services* (eDOS). eDOS is an HL7 2.6 implementation of the CDC, and it is the preferred format for the Quest test compendium. The eDOS files are posted by Quest BUs and are available to you via WebDAV, just as the CDC files are. For more information on eDOS, see [Chapter 11, “eDOS laboratory test compendium framework” beginning on page 332](#).

About the CDC datasets

A separate set of *CDC* dataset files is maintained for each Quest lab, as well as each EMR vendor. The dataset files that comprise the *CDC* are updated weekly by Quest, and are automatically retrieved and stored by the Quantum Hub.

After the Quantum Hub has retrieved the latest data, the vendor can connect to the WebDAV server to download data specific to their application, which can then be integrated into its lab orders workflow.

Dataset overview

The *CDC* provides the following dataset types:

- **Master data files**
 - Orderable service codes
 - Reportable service codes
 - Analyte codes
 - Ask on Order Entry (AOE) questions
 - Order code/analyte code cross-reference
 - Profile code/component code cross-reference
 - *Current Procedural Terminology* (CPT) codes
 - Third-party insurance
 - Directory of Services (DOS) dataset files
- **MCLP**
 - Service code/CPT code cross-reference client data

Dataset file list

The dataset files that the *CDC* provides are listed in the following table. Each of these datasets is described in more detail in the sections that follow (presented alphabetically by dataset name).

Dataset	CDC_Table name	MSH code	File name ^a	Req'd ^b
Analyte Details dataset	Analyte_Code_Xref	AC	<i>ANALYTE.TXT</i>	O
Bill-To dataset	Bill_To	BT	<i>BILL_TO.TXT</i>	R
CPT Codes dataset	Test_Code_CPT_Code_Xref	DB	<i>CPTCODES.TXT</i>	O
CPT ICD dataset	ISP_CPT_ICD_Payable	CI	<i>CPTICD10.TXT</i>	R
DOS Container dataset	Container	DC	<i>CONTAINER.TXT</i>	O
DOS Methodology dataset	Methodology	DM	<i>METHODOLOGY.TXT</i>	O

^aEach file name includes an underscore, followed by a 3-digit code, to identify the corresponding Quest lab or EMR vendor. For example, *SITES_TMP.TXT* is the *Performing Site Code* file for the Quest Tampa lab.

^bR = Required, O = Optional, C = Conditional.

Dataset	CDC_Table name	MSH code	File name ^a	Req'd ^b
DOS Minimum Volume dataset	Minimum_Specimen_Volume	DV	<i>SPECIMENVOL.TXT</i>	O
DOS Preferred Requirement dataset	PREFERRED_SPECIMEN_REQUIREMENT	DP	<i>SPECIMENREQ.TXT</i>	O
DOS Reject Hemolysis dataset	Specimen_Reject_Hemolysis	DH	<i>HEMOLYSIS.TXT</i>	O
DOS Reject Lipemia dataset	Specimen_Reject_Lipemia	DL	<i>LIPEMIA.TXT</i>	O
DOS Reject Thaw Other dataset	Specimen_Reject_Thaw_Other	DT	<i>THAWOTHER.TXT</i>	O
DOS Specimen Stability dataset	Specimen_Stability	DS	<i>SPECIMENSTAB.TXT</i>	O
DOS Transport Temperature dataset	Transport_Temperature	DX	<i>TRANSPORT.TXT</i>	O
Order Code dataset	Test_Code_Unit_Code_Xref	OC	<i>ORDCODE.TXT</i>	R
Order Code AOE dataset	AOE	OA	<i>AOE.TXT</i>	R
Order Code Component dataset	Profile_Component_Xref	OP	<i>PROFILE.TXT</i>	O
Orderable CPT dataset	Orderable_Cpt	OT	<i>ORDERCPT.TXT</i>	R
Performing Site Code dataset	Performing_Site_Code	PS	<i>SITES.TXT</i>	C
Reportable Test Code dataset	Reportable_Test_Code	RC	<i>REPORTABLE.TXT</i>	O
Worklist Components dataset	Worklist_Component_Xref	WC	<i>WORKLIST.TXT</i>	O

^aEach file name includes an underscore, followed by a 3-digit code, to identify the corresponding Quest lab or EMR vendor. For example, *SITES_TMP.TXT* is the *Performing Site Code* file for the Quest Tampa lab.

^bR = Required, O = Optional, C = Conditional.

CDC Dataset file specifications

The *CDC* is a current collection of all reference data needed to create a complete and valid electronic order for Quest laboratory systems or other EMR vendors. This section summarizes the format and contents of the reference data that can be retrieved from the Quantum Hub for use in the vendor application.

Dataset files retrieved from the *CDC* are caret-delimited text files. Each file includes a message header (MSH segment) in the format described below.

MSH — Message Header segment

The Message Header (MSH) segment defines the intent, source, destination, and some specifics of the syntax of a message.

Example MSH segment:

```
MSH|^~\&|OERDB|WDL|NEON||202410231117||MFN^OP|01|P|2.3
```

Segment	Element name	Type ^a	Length	Comments
1	Field separator	ST	1	A vertical bar ().
2	Encoding characters	ST	4	The following characters: <ul style="list-style-type: none">• ^• ~• \• &
3	Sending application	ST	15	This is OERDB.
4	Sending facility	ST	20	The laboratory code or QLS performing site.
5	Receiving application	ST	30	This is NEON, the interface engine.
7	Date/time of message	TS	26	The date and time in the following format: yyyymmddhhmm.
9	Message type	CM	7	The MFN^MSH type code.
10	Message control ID	ST	20	The unique identifier for the message.
11	Processing ID	ID	1	For Production, use P.
12	Version ID	ID	8	For Version, use 2.3.

^aCM = Composite, ID = Coded value for HL7-defined tables, ST = String data, TS = Time stamp.

Dataset file details

This section provides the field-level details for each of the datasets listed in the “Dataset file list” on page 301. Datasets are listed alphabetically by dataset name, and the CDC table name for each dataset is shown in the table heading.

Note: All of the data type **char** fields are variable length, up to the maximum length specified in the *Length* column.

Analyte Details dataset

File Name: ANALYTE.TXT

CDC Table Name: Analyte_Code_Xref

Usage: Optional

Description: This dataset provides a list of result codes (analyte details). The vendor application should display the full name (field 5). This dataset is only needed for applications that require a one-to-one match between the order and result codes.

Field	Field name	Type	Length	Comments
1	LABORATORY_CD	char	3	The legal entity (QLS) or lab site identifier.
2	QLS_PERFORMING_SITE	char	3	This is included with QLS sites only, and is the same as field 1.
3	ANALYTE_CD	char	11	The analyte code, which must match <i>WORKLIST.TXT</i> field 5.
4	ANALYTE_MNEMONIC	char	25	The short name (for example, <i>NA</i>), which can be same as field 3.
5	ANALYTE_LINE_1_DESC	char	50	The full name (for example, <i>Sodium</i>).
6	ANALYTE_LINE_2_DESC	char	25	This field is not in use.
7	PLACEHOLDER	char	1	This field is not in use.
8	PLACEHOLDER	char	1	This field is not in use.
9	LOINC_NUMBER	char	15	The LOINC Code value.
10	LIS_UNIT_OF_MEASURE	char	100	The <i>LIS Unit of Measure</i> . Example: mg/dL or mg/deciliter
11	UPDATE_TYPE	char	1	One of the following update types: <ul style="list-style-type: none">• A: Added records• U: Updated records• I: Inactive records

Note: This field only appears in incremental files.

Bill-To dataset

File Name: *BILL_TO.TXT*

CDC Table Name: *Bill_To*

Usage: Required

Description: This dataset contains valid bill codes or mnemonics to be used in third-party billing. There is 1 entry per carrier and 1 per billable client. No address or other contact information is provided. The value in field 2 should be 0 (zero); only use those with this value.

Field	Field name	Type	Length	Comments
1	LEGAL_ENTITY	char	3	The lab identifier assigned in the National Billing Service (NBS) system based on the client's county/state designation.
2	NBS_CLIENT_NO	char	15	The NBS client number.
3	BILLING_ID	char	9	A mnemonic code or client number representing a third-party insurance carrier. Examples: <ul style="list-style-type: none">• MHCC• UHC• 00023496
4	QLS_CLIENT_MNEMONIC	char	8	The QLS client number.
5	THIRD_PARTY_FORMS_CD	char	6	The NBS third-party form code. Note: This field is blank if the billing CD is a number.
6	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
7	NAME	char	50	The description (name) of the third-party insurance carrier.
8	ADDR_LINE_1	char	30	The street address or post office box number.
9	ADDR_LINE_2	char	30	The street address or post office box number.
10	CITY	char	30	The city name.
11	STATE	char	2	The United States Postal Service (USPS) 2-character state alpha designation.
12	ZIP_CD	char	10	The United States Postal Service (USPS) 5-digit locator, hyphen, and 4-digit locator. Example: 18360-6501
13	COUNTRY	char	4	The insurance country code.

Field	Field name	Type	Length	Comments
				The default (assumed) value is US.
14	PHONE_NO	char	16	The insurance phone number.
15	FAX_NO	char	16	The fax number.
16	THIRD_PARTY_HMO_FLAG	char	1	The QLS HMO carrier indicator. Valid values are: <ul style="list-style-type: none"> • Y: HMO carrier • N: Not an HMO carrier • Blank: Unknown
17	BILLING_TYPE	char	1	The QLS billing type indicator. Valid values are: <ul style="list-style-type: none"> • 2: Patient • 3: Medicare • 4: Medicaid • 5: Med/Med • 6: Private insurance
18	MASTER_MNEMONIC	char	9	The master mnemonic code for eligibility checking. Examples: <ul style="list-style-type: none"> • AUSHC: Aetna US Healthcare • CGM: CIGNA Healthcare Group
19	UPDATE_TYPE	char	1	One of the following update types: <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive records Note: This field only appears in incremental files. Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank): <ul style="list-style-type: none"> • 1: LEGAL_ENTITY • 3: BILLING_ID • 6: QLS_PERFORMING_SITE

CPT Codes dataset

File Name: CPTCODES.TXT

CDC Table Name: Test_Code_CPT_Code_Xref

Usage: Optional

Description: This dataset links test/order codes to CPT codes and is used for all CPT codes (whether they are limited coverage or not).

The CPT Codes dataset is used for *Directory of Service* (DOS) display of the test codes. For determining whether or not an Advanced Beneficiary Notice (ABN) is needed for an order, the *Orderable CPT* dataset is used.

For more information, see [“Orderable CPT dataset” on page 321](#).

Field	Field name	Type	Length	Comments
1	QLS_PERFORMING_SITE	char	3	This is the QLS performing lab identifier or lab site identifier.
2	TEST_CD	char	16	This is the orderable test code sent to the lab (the Quest standard order code).
3	Placeholder	-----	-----	This field is not in use.
4	CPT_CD	char	5	This is the CPT code.
5	CPT_SERVICE_UNITS_CNT	number	2	This is the CPT service units count, which indicates the number of times the CPT code occurs for an order code. For example, if CPT code 83735 should be applied 3 times for a given order code, submit 3 in this field.
6	UPDATE_TYPE	char	1	One of the following update types: <ul style="list-style-type: none">• A: Added records• U: Updated records• I: Inactive records Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank): <ul style="list-style-type: none">• 1: QLS_PERFORMING_SITE• 2: TEST_CD• 4: CPT_CD

CPT ICD dataset

File Name: *CPTICD10.TXT*

CDC Table Name: *ISP_CPT_ICD_Payable*

Usage: Required

Description: This links CPT codes to diagnosis (ICD) codes for a given dataset and is used for a medical necessity program (eg, a Medicare limited coverage policy). This dataset is to be used when Medicare is part of the third-party billing targets.

Field	Field name	Type	Length	Comments
1	DATASET_NM	char	20	The name of the medical necessity dataset for a given region.
2	CPT_CD	char	7	The CPT code.
3	ICD_CD	char	7	The diagnosis (ICD) code, without a decimal point (eg, E8581 or E103293).
4	UPDATE_TYPE	char	1	One of the following update types: <ul style="list-style-type: none">• A: Added records• U: Updated records• I: Inactive records

Note: This field only appears in incremental files.

DOS Container dataset

File Name: *CONTAINER.TXT*

CDC Table Name: *Container*

Usage: Optional

Description: This dataset provides DOS information for specimen container requirements, and describes how the test (specimen) is to be transported (container type). It can contain multiple entries per test code (1 per line).

Field	Field name	Type	Length	Comments
1	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
3	SEQUENCE_NO	int	2	The sequence number (the number of entries, or lines).

Field	Field name	Type	Length	Comments
4	COMMENT_TXT	char	60	The text description of container.
5	UPDATE_TYPE	char	1	<p>One of the following update types:</p> <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive records <p>Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank):</p> <ul style="list-style-type: none"> • 1: QLS_PERFORMING_SITE • 2: TEST_CD

DOS Methodology dataset

File Name: *METHODOLOGY.TXT*

CDC Table Name: *Methodology*

Usage: Optional

Description: This dataset provides DOS information for testing methodology. It can contain multiple entries per test code (1 per line). (This dataset is not often used.)

Field	Field name	Type	Length	Comments
1	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
3	SEQUENCE_NO	int	2	The sequence number (the number of entries, or lines).
4	COMMENT_TXT	char	60	The text description of the method (eg, IMMUNOHISTOCHEMICAL ASSAY (IHC), Microscopy, Karyotype).
5	UPDATE_TYPE	char	1	<p>One of the following update types:</p> <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive records <p>Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank):</p> <ul style="list-style-type: none"> • 1: QLS_PERFORMING_SITE • 2: TEST_CD

DOS Minimum Volume dataset

File Name: *SPECIMENVOL.TXT*

CDC Table Name: *Minimum_Specimen_Volume*

Usage: Optional

Description: This dataset provides DOS information for the minimum volume of specimen required to perform the test once. It can contain multiple entries per test code (1 per line).

Field	Field name	Type	Length	Comments
1	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
3	SEQUENCE_NO	int	2	The sequence number (the number of entries, or lines).
4	COMMENT_TXT	char	60	The text description of volume (eg, 1 swab, 1 mL bone marrow).
5	UPDATE_TYPE	char	1	One of the following update types: <ul style="list-style-type: none">• A: Added records• U: Updated records• I: Inactive records Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank): <ul style="list-style-type: none">• 1: QLS_PERFORMING_SITE• 2: TEST_CD

DOS Preferred Requirement dataset

File Name: *SPECIMENREQ.TXT*

CDC Table Name: *PREFERRED_SPECIMEN_REQUIREMENT*

Usage: Optional

Description: This dataset provides DOS information for specimen collection requirements and can contain multiple entries per test code (1 per line).

Field	Field name	Type	Length	Comments
1	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).

Field	Field name	Type	Length	Comments
3	SEQUENCE_NO	int	2	The sequence number (the number of entries, or lines).
4	COMMENT_TXT	char	60	The text description of the specimen requirement (eg, Patient Preparation: Fasting specimen is preferred. 1 mL serum).
5	UPDATE_TYPE	char	1	<p>One of the following update types:</p> <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive records <p>Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank):</p> <ul style="list-style-type: none"> • 1: QLS_PERFORMING_SITE • 2: TEST_CD

DOS Reject Hemolysis dataset

File Name: *HEMOLYSIS.TXT*

CDC Table Name: *Specimen_Reject_Hemolysis*

Usage: Optional

Description: This dataset provides DOS information for rejection criteria for hemolyzed specimens (data indicating whether or not hemolite sample will affect the result of a specific test). It can contain multiple entries per test code (1 per line).

Field	Field name	Type	Length	Comments
1	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
3	SEQUENCE_NO	int	2	The sequence number (the number of entries, or lines).

Field	Field name	Type	Length	Comments
4	COMMENT_TXT	char	60	A text description of data (eg, Gross hemolysis).
5	UPDATE_TYPE	char	1	<p>One of the following update types:</p> <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive records <p>Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank):</p> <ul style="list-style-type: none"> • 1: QLS_PERFORMING_SITE • 2: TEST_CD

DOS Reject Lipemia dataset

File Name: *LIPEMIA.TXT*

CDC Table Name: *Specimen_Reject_Lipemia*

Usage: Optional

Description: This dataset provides DOS information for rejection criteria for lipemic specimens (data indicating whether or not lipemia sample will affect the result of a specific test). It can contain multiple entries per test code (1 per line).

Field	Field name	Type	Length	Comments
1	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
3	SEQUENCE_NO	int	2	The sequence number (the number of entries, or lines).
4	COMMENT_TXT	char	60	The text description of the data (eg, Grossly lipemic).
5	UPDATE_TYPE	char	1	<p>One of the following update types:</p> <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive records <p>Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank):</p> <ul style="list-style-type: none"> • 1: QLS_PERFORMING_SITE • 2: TEST_CD

DOS Reject Thaw Other dataset

File Name: THAWOTHER.TXT

CDC Table Name: Specimen_Reject_Thaw_Other

Usage: Optional

Description: This dataset provides DOS information for rejection for thaw cycles and other criteria. It provides optional specimens for a particular test, as well as optional reasons for rejection. It can contain multiple entries per test code (1 per line).

Field	Field name	Type	Length	Comments
1	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
3	SEQUENCE_NO	int	2	The sequence number (the number of entries, or lines).
4	COMMENT_TXT	char	60	A text description of the rejection reason (eg, SPECIMEN RECEIVED IN TRANSPORT MEDIA).
5	UPDATE_TYPE	char	1	One of the following update types: <ul style="list-style-type: none">• A: Added records• U: Updated records• I: Inactive records Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank): <ul style="list-style-type: none">• 1: QLS_PERFORMING_SITE• 2: TEST_CD

DOS Specimen Stability dataset

File Name: SPECIMENSTAB.TXT

CDC Table Name: Specimen_Stability

Usage: Optional

Description: This dataset provides DOS information for the length of time (eg, months, weeks, days, hours) a specimen can remain at given temperatures and still produce accurate results. It can contain multiple entries per test code (1 per line).

Field	Field name	Type	Length	Comments
1	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
3	SEQUENCE_NO	int	2	The sequence number (the number of entries, or lines).
4	COMMENT_TXT	char	60	A text description of specimen stability (eg, Room Temperature: 30 days, Refrigerated: 90 days, Frozen: Unacceptable).
5	UPDATE_TYPE	char	1	<p>One of the following update types:</p> <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive records <p>Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank):</p> <ul style="list-style-type: none"> • 1: QLS_PERFORMING_SITE • 2: TEST_CD

DOS Transport Temperature dataset

File Name: *TRANSPORT.TXT*

CDC Table Name: *Transport_Temperature*

Usage: Optional

Description: This dataset provides DOS information for optional temperature requirements for specimen storage and transport. (The preferred temperature is included in the *Order Code* dataset.) It can contain multiple entries per test code (1 per line).

Field	Field name	Type	Length	Comments
1	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
3	SEQUENCE_NO	int	2	The sequence number (the number of entries, or lines).

Field	Field name	Type	Length	Comments
4	COMMENT_TXT	char	60	The text description of specimen temperature (eg, Room temperature).
5	UPDATE_TYPE	char	1	<p>One of the following update types:</p> <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive records <p>Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank):</p> <ul style="list-style-type: none"> • 1: QLS_PERFORMING_SITE • 2: TEST_CD

Order Code dataset

File Name: *ORDCODE.TXT*

CDC Table Name: *Test_Code_Unit_Code_Xref*

Usage: Required

Description: This dataset is a reference table containing the test code and its associated unit code. Provides data about orderable tests and codes (such as draw fees). There is 1 entry per orderable code per lab site (this is not used for profiles).

Field	Field name	Type	Length	Comments
1	LEGAL_ENTITY	char	3	This is the lab identifier assigned in the National Billing Service (NBS) system based on the client's county/state designation.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
3	STATE	char	2	<p>The specimen condition (transport temperature) of an order code.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • A: Ambient • F: Frozen • FR/FZ: Frozen • G: Groupable or Refrigerated • H: Handwritten requisition only • M: Multiple specimen transport types are possible; the user selects the temperature to send the specimen from the list provided

Field	Field name	Type	Length	Comments
				<ul style="list-style-type: none"> • R: Room Temp • RF: Refrigerated • RT: Room Temperature • S: Split requisition—anatomic pathology items and micros • T: Test has been discontinued and/or is not orderable • W: Wet ice • Z: Split requisition for pain management
4	UNIT_CD	char	10	The LIS unit code.
5	ACTIVE_IND	char	1	<p>A character code indicating the status of a record or objective within an application or database.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • A: Active • I: Inactive
6	INSERT_DATETIME	datetime	19	The date and time when the row was created.
7	DESCRIPTION	char	175	The test description (full name; eg, MICRONUTRIENT, VITAMIN C).
8	SPECIMEN_TYPE	char	30	The type of specimen collected (eg, SERUM).
9	NBS_SERVICE_CODE	char	10	This code ties the order codes to billing information.
10	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
11	UPDATE_DATETIME	datetime	19	The date and time when the row was last updated.
12	UPDATE_USER	char	8	The identifier of the person or computer program that last updated the data.
13	SUFFIX	char	8	The orderable test code suffix used for QLS sites.
14	PROFILE_IND	char	1	<p>The profile indicator, which specifies whether or not test is a profile. For profiles, the application should map to a profile file to find components.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • Y: profile

Field	Field name	Type	Length	Comments
				<ul style="list-style-type: none"> • N: not a profile
15	SELECTEST_IND	char	1	<p>This indicator identifies the test code as a <i>Select Test</i>.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • Y: a <i>Select Test</i> • N: not a <i>Select Test</i>
16	NBS_PERFORMING_SITE	char	4	This is the Quest laboratory's site code.
17	TEST_FLAG	char	1	<p>A test flag.</p> <p>If the value is P, display the PAP template, and do not combine with another test.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • P: (PAP tests) • Q: (AOE questions) • blank
18	NO_BILL_INDICATOR	char	1	<p>A flag to indicate if a code is not billed.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • Y or 1: this code is not billed • N or 0: this code is billed • blank
19	BILL_ONLY_INDICATOR	char	1	<p>A flag to indicate if a code is billed without a test performed.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • Y: this code is billed but is not a test • N: this code is not billed • blank
20	SEND_OUT_REFLEX_COUNT	int	2	An integer (eg, 1, 2).
21	CONFORMING_IND	char	1	This is always blank.
22	ALTERNATE_TEMP	char	1	The alternate temperature for specimens.
23	PAP_IND	char	1	<p>If the value is P, this indicates that the requisition should be split between AP and Clinical.</p> <p>Note: If no value is defined in table <i>NEON_PAP_TESTS</i>, the TEST_FLAG will be used.</p>
24	UPDATE_TYPE	char	1	<p>One of the following update types:</p> <ul style="list-style-type: none"> • A: Added records

Field	Field name	Type	Length	Comments
				<ul style="list-style-type: none"> U: Updated records I: Inactive records <p>Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank):</p> <ul style="list-style-type: none"> 1: QLS_PERFORMING_SITE 2: TEST_CD 4: UNIT_CD 10: QLS_PERFORMING_SITE
25	STATE_AVAILABILITY_SITES	char	4000	A list of states where the test is available. This field can be blank.
26	RESTRICTED_STATES	char	4000	A list of states where the test is not available. This field can be blank.
27	STATE_RESTRICTION_DISCLOSURE	char	4000	A list of restricted states. This field can be blank.

Order Code AOE dataset

File Name: AOE.TXT

CDC Table Name: AOE

Usage: Required

Description: This dataset is a reference table containing the *Unit Code* and its associated analytes. The analytes contain the Ask at Order Entry (AOE) questions and valid responses needed to process the test. Valid responses can be provided in a drop-down list box. There is one entry per AOE question.

Field	Field name	Type	Length	Comments
1	LEGAL_ENTITY	char	3	This is the lab identifier assigned in the National Billing Service (NBS) system based on the client's county/state designation.
2	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
3	UNIT_CD	char	10	The LIS unit code.
4	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
5	ANALYTE_CD	char	11	The unique number or code to identify a test.

Field	Field name	Type	Length	Comments
6	AOE_QUESTION	char	30	The pre-resulted result code which sends the answer with the order (eg, SMOKER).
7	ACTIVE_IND	char	1	A character code indicating the status of a record or objective within an application or database. Valid values are: <ul style="list-style-type: none"> • A: active • I: inactive
8	PROFILE_COMPONENT	char	15	This can be the order code or units that make up the profile.
9	INSERT_DATETIME	datetime	19	The date and time when the row was created.
10	AOE_QUESTION_DESC	char	50	These are descriptions of the AOE questions (eg, Cigarette smoker).
11	SUFFIX	char	8	The orderable test code suffix.
12	RESULT_FILTER	char	250	The responses to AOE questions (eg, ENTER Y, N OR NG (NOT GIVEN)).
13	TEST_CD_MNEMONIC	char	16	This is the same as TEST_CD for non-QLS sites.
14	TEST_FLAG	char	1	
15	UPDATE_DATETIME	datetime	19	The date and time when the row was last updated.
16	UPDATE_USER	char	8	The identifier of the person or computer program that last updated the data.

Field	Field name	Type	Length	Comments
17	COMPONENT_NAME	char	200	A valid value is structured as follows: <i>profile_component_code unit_cd profile_component_name</i> (eg, 10837X= 6600010837 DERMPATH, SPECIMEN A).
18	UPDATE_TYPE Note: This field only appears in incremental files.	char	1	One of the following update types: <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive records Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank): <ul style="list-style-type: none"> • 1: LEGAL_ENTITY • 2: QLS_PERFORMING_SITE • 3: UNIT_CD • 4: TEST_CD • 5: ANALYTE_CD • 6: AOE_QUESTION • 12: RESULT_FILTER

Order Code Component dataset

File Name: *PROFILE.TXT*

CDC Table Name: *Profile_Component_Xref*

Usage: Optional

Description: This dataset is the profile/component cross-reference files (from QLS). It identifies the components of order codes that represent profiles. There is 1 entry per profile component.

Field	Field name	Type	Length	Comments
1	LEGAL_ENTITY	char	3	The lab identifier assigned in the National Billing Service (NBS) system based on the client's county/state designation.
2	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
3	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).

Field	Field name	Type	Length	Comments
4	COMPONENT_TEST_CD	char	50	The profile component order code. In non-QLS sites, this is the Quest standard order code component.
5	COMPONENT_UNIT_CD	char	10	The orderable code sent to the lab. In non-QLS sites, this is the LIS code component.
6	DESCRIPTION	char	175	The component name (eg, CHOLESTEROL, TOTAL).
7	SPECIMEN_TYPE	char	130	The type of specimen collected (eg, SERUM).
8	SPECIMEN_STATE	char	2	The specimen condition (transport temperature) of the component unit code. Valid values are: <ul style="list-style-type: none"> • FR/FZ: Frozen • RT: Room Temperature • RF: Refrigerated
9	UPDATE_TYPE	char	1	One of the following update types: <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive records <p>Note: This field only appears in incremental files.</p> <p>Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank):</p> <ul style="list-style-type: none"> • 1: LEGAL_ENTITY • 2: QLS_PERFORMING_SITE • 3: TEST_CD • 4: COMPONENT_TEST_CD

Orderable CPT dataset

File Name: *ORDERCPT.TXT*

CDC Table Name: *Orderable_Cpt*

Usage: Optional

Description: This dataset links orderable test codes to CPT codes for a given dataset and is used for determining whether or not an ABN is needed for an order.

Field	Field name	Type	Length	Comments
1	QLS_PERFORMING_SITE	char	3	The QLS performing lab identifier or lab site identifier.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
3	EXPIRATION_DATE	datetime	19	This field has a default entry of Jan 1 1900 and does not need to be altered.
4	DATASET_NM	char	20	This is the medical necessity dataset name for a given region.
5	CPT_CD	char	7	This is the CPT code.
6	MLCP_FDA	char	1	This is the market coverage. Valid values are: <ul style="list-style-type: none"> • L: Limited (LCP) • N: non-FDA approved • F: Frequency tests • B: L and F If the value is L or B, the application must look at the CPT ICD-10 codes.
7	PATIENT_PRICE	char	8	This is the patient price, formatted as: xxxxxx.xx
8	UPDATE_TYPE	char	1	One of the following update types: <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive record Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank): <ul style="list-style-type: none"> • 1: QLS_PERFORMING_SITE • 2: TEST_CD • 4: DATASET_NM • 5: CPT_CD Note: This field only appears in incremental files.

Performing Site Code dataset

File Name: *SITES.TXT*

CDC Table Name: *Performing_Site_Code*

Usage: Conditional. If the data is not retrieved from the HL7 message, this dataset is required. Otherwise, this dataset is optional.

Description: List (per CLIA requirement) that indicates the Quest facility where the test was performed.

Field	Field name	Type	Length	Comments
1	LABORATORY_CD	char	3	The QLS performing lab identifier or lab site identifier.
2	FACILITY_CD	char	5	The site (facility) code.
3	COUNTRY	char	4	The country where the site is located. Valid values are: <ul style="list-style-type: none"> • US • blank
4	ACTIVE_FLAG	char	1	Valid values are: <ul style="list-style-type: none"> • 1: active • 0: inactive
5	INHOUSE_FLAG	char	1	A flag that indicates if the site belongs to Quest. Valid values are: <ul style="list-style-type: none"> • 1: Quest facility • 0: vendor facility.
6	FACILITY_NAME	char	50	The site name.
7	ADDR_LINE_1	char	50	The site address (line 1).
8	ADDR_LINE_2	char	50	The site address (line 2).
9	CITY	char	30	The site city.
10	STATE	char	2	The site state.
11	ZIP_CD	char	10	The site zip/postal code.
12	PHONE_NO	char	16	The site phone number.
13	PC_MES_FLAG	char	1	
14	SPECIMEN_GROUP	char	16	
15	REQ_LABEL	char	20	
16	SPECIMEN_LABEL	char	20	
17	SEND_IN_LABEL	char	20	
18	SEND_OUT_LABEL	char	20	
19	COMBO_LABEL	char	20	
20	SORT_DEVICE	char	5	
21	ALQUOTER_LABEL	char	20	

Field	Field name	Type	Length	Comments
22	MEDICAL_DIRECTOR	char	25	The name of the site's medical director.
23	UPDATE_TYPE	char	1	<p>One of the following update types:</p> <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive record <p>Note: If the update type is I (inactive record), only the following fields are populated (all other fields are blank):</p> <ul style="list-style-type: none"> • 1: LABORATORY_CD • 2: FACILITY_CD

Reportable Test Code dataset

File Name: *REPORTABLE.TXT*

CDC Table Name: *Reportable_Test_Code*

Usage: Optional

Description: This dataset contains tests that are not orderable but can be reported. This is used primarily for reflex tests (QLS sites only).

Field	Field Name	Type	Length	Comments
1	LEGAL_ENTITY	char	3	The lab identifier assigned in the National Billing Service (NBS) system based on the client's county/state designation.
2	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
3	ACTIVE_IND	char	1	This is A for active.
4	STATE	char	2	
5	DESCRIPTION	char	75	The test description or full name (eg, IMMUNOGLOBULIN A).
6	SPECIMEN_TYPE	char	30	The type of specimen collected (eg, SERUM).
7	QLS PERFORMING SITE	char	3	The QLS performing lab identifier or lab site identifier.
8	TEST_CD_MNEMONIC	char	16	The non-orderable test code.
9	SUFFIX	char	8	The orderable test code suffix used for QLS sites.
10	UNIT_CD	char	10	The LIS unit code.
11	NBS_PERFORMING_SITE	char	4	This is the Quest laboratory's site code.

Field	Field Name	Type	Length	Comments
12	NBS_SERVICE_CODE	char	10	This code ties the order codes to billing information.
13	UPDATE_TYPE	char	1	One of the following update types: <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive record <p>Note: This field only appears in incremental files.</p>

Worklist Components dataset

File Name: *WORKLIST.TXT*

CDC Table Name: *Worklist_Component_Xref*

Usage: Optional

Description: This dataset specifies the analytes that belong to each test (order code) and provides a cross-reference between the “[Order Code dataset](#)” on page 315 and the “[Analyte Details dataset](#)” on page 304.

Field	Field name	Type	Length	Comments
1	LABORATORY_CD	char	3	The QLS performing lab identifier or lab site identifier.
2	QLS PERFORMING SITE	char	3	The QLS performing lab identifier or lab site identifier.
3	TEST_CD	char	16	The orderable test code sent to the lab (the Quest standard order code).
4	SUFFIX	char	8	The orderable test code suffix used for QLS sites.
5	ANALYTE_CD	char	11	The result (analyte) code, which must match <i>ANALYTE.TXT</i> field 3.
6	UNIT_CD	char	10	The LIS unit code.
7	ACTIVE_IND	char	1	
8	UPDATE_DATETIME	char	30	The date and time when the row was last updated.
9	UPDATE_TYPE	char	1	One of the following update types: <ul style="list-style-type: none"> • A: Added records • U: Updated records • I: Inactive record <p>Note: This field only appears in incremental files.</p>

Sample CDC dataset files

Following are several sample CDC dataset files. (Note that only the top portion of each file is shown, since the typical file is too large to include here in total.) Examples shown are from the Quest Chicago-WoodDale lab (WDL) and the Quest Tampa lab (TMP).

Sample 1—Analyte details

```
MSH|^~\&|OERDB|WDL|NEON||202312121945||MFN^AC|01|P|2.3
WDL^WDL^24999900^FLUID^FLUID^^^^14725-6^
WDL^WDL^25000000^GLU^GLUCOSE^^^^2345-7^mg/dL
WDL^WDL^25000100^BUN^UREA NITROGEN (BUN)^^^^3094-0^mg/dL
WDL^WDL^25000200^CREA^CREATININE^^^^2160-0^mg/dL
WDL^WDL^25000210^EGFR^eGFR NON-AFR. AMERICAN^^^^88294-4^mL/min/1.73m2
WDL^WDL^25000220^EGFRA^eGFR AFRICAN AMERICAN^^^^88293-6^mL/min/1.73m2
WDL^WDL^25000300^B/C^BUN/CREATININE RATIO^^^^3097-3^(calc)
WDL^WDL^25000400^NA^SODIUM^^^^2951-2^mmol/L
WDL^WDL^25000450^NAP^SODIUM^^^^2951-2^mmol/L
WDL^WDL^25000500^K^POTASSIUM^^^^2823-3^mmol/L
WDL^WDL^25000550^KP^POTASSIUM^^^^2823-3^mmol/L
WDL^WDL^25000600^CL^CHLORIDE^^^^2075-0^mmol/L
WDL^WDL^25000650^CLP^CHLORIDE^^^^2075-0^mmol/L
WDL^WDL^25000700^CO2^CARBON DIOXIDE^^^^2028-9^mmol/L
WDL^WDL^25000750^CO2P^CARBON DIOXIDE^^^^2028-9^mmol/L
WDL^WDL^25000800^ANGP^ELECTROLYTE BALANCE^^^^1863-0^mmol/L (calc)
WDL^WDL^25000900^MG^MAGNESIUM^^^^19123-9^mg/dL
WDL^WDL^25001000^CA^CALCIUM^^^^17861-6^mg/dL
WDL^WDL^25001200^PO4^PHOSPHATE (AS PHOSPHORUS)^^^^2777-1^mg/dL
WDL^WDL^25001300^TP^PROTEIN, TOTAL^^^^2885-2^g/dL
WDL^WDL^25001400^ALB^ALBUMIN^^^^1751-7^g/dL
WDL^WDL^25001500^GLOB^GLOBULIN^^^^10834-0^g/dL (calc)
WDL^WDL^25001563^LDPL^LD, PLEURAL FLUID^^^^60022-1^U/L
WDL^WDL^25001600^A/G^ALBUMIN/GLOBULIN RATIO^^^^1759-0^(calc)
WDL^WDL^25001700^TB^BILIRUBIN, TOTAL^^^^1975-2^mg/dL
WDL^WDL^25001800^DB^BILIRUBIN, DIRECT^^^^1968-7^mg/dL
WDL^WDL^25001900^IB^BILIRUBIN, INDIRECT^^^^1971-1^mg/dL (calc)
WDL^WDL^25002000^AP^ALKALINE PHOSPHATASE^^^^6768-6^U/L
WDL^WDL^25002100^LDH^LD^^^^14805-6^U/L
WDL^WDL^25002200^GGT^GGT^^^^2324-2^U/L
WDL^WDL^25002300^SGOT^AST^^^^1920-8^U/L
WDL^WDL^25002400^SGPT^ALT^^^^1742-6^U/L
WDL^WDL^25002500^UA^URIC ACID^^^^3084-1^mg/dL
WDL^WDL^25002600^IRON^IRON, TOTAL^^^^2498-4^mcg/dL
WDL^WDL^25002700^IBC^IRON BINDING CAPACITY^^^^2500-7^mcg/dL (calc)
WDL^WDL^25002800^%SAT^% SATURATION^^^^2502-3%(calc)
WDL^WDL^25002900^TRIG^TRIGLYCERIDES^^^^2571-8^mg/dL
WDL^WDL^25003000^CHOL^CHOLESTEROL, TOTAL^^^^2093-3^mg/dL
WDL^WDL^25003500^RAM^RAM^^^^^
WDL^WDL^25003510^RAM^RAM^^^^^
WDL^WDL^25003900^LT2H^2 HOUR SPECIMEN^^^^1517-2^mg/dL
WDL^WDL^25004000^LT30M^1/2 HOUR SPECIMEN^^^^1526-3^mg/dL
WDL^WDL^25004200^GTF^FASTING SPECIMEN^^^^1558-6^mg/dL
```

WDL^WDL^25004300^LT1H^1 HOUR SPECIMEN^^^^1506-5^mg/dL
WDL^WDL^25004400^LT3H^3 HOUR SPECIMEN^^^^13606-9^mg/dL
WDL^WDL^25005800^GGF^GLUCOSE, FASTING^^^^1558-6^mg/dL
WDL^WDL^25005900^GG1H^GLUCOSE, 1 HOUR^^^^12646-6^mg/dL

Sample 2—Container

MSH|^~\&|OERDB|TMP|NEON||202406081614||MFN^DC|01|P|2.3
TMP^10014^1^(6447RQEZ=) HSV 1&2 IGG TYPE SPECIFIC ANTIBODIES
TMP^10014^2^PLASTIC SCREW-CAP VIAL
TMP^10014^3^(%7438RQEZ) HERPES SIMPLEX VIRUS IGM ANTIBODY, SCREEN
TMP^10014^4^STERILE SCREW CAP VIAL
TMP^10014^5^(%38750RQEZ) HERPES SIMPLEX VIRUS IGM ANTIBODY, TITER
TMP^10014^6^STERILE SCREW CAP VIAL
TMP^10018^1^10% FORMALIN TRANSPORT VIAL
TMP^10019^1^CARY-BLAIR TRANSPORT VIAL
TMP^10021^1^STERILE SCREW CAP VIAL
TMP^10022^1^PLASTIC SCREW CAP VIAL
TMP^10023^1^PARAFFIN BLOCK BAG
TMP^10024^1^PARAFFIN BLOCK BAG
TMP^10026^1^PARAFFIN BLOCK BAG
TMP^10027^1^PARAFFIN BLOCK BAG
TMP^10028^1^PARAFFIN BLOCK BAG
TMP^10040^1^PLASTIC SCREW CAP VIALS
TMP^10045^1^(4475SB=) CULTURE, CAMPYLOBACTER
TMP^10045^2^CARY-BLAIR TRANSPORT DEVICE OR OTHER APPROPRIATE STOOL
TMP^10045^3^TRANSPORT MEDIUM
TMP^10045^4^(10019SB=) CULTURE, SALMONELLA AND SHIGELLA
TMP^10045^5^CARY-BLAIR TRANSPORT VIAL
TMP^10046^1^STERILE SCREW-CAP CONTAINER
TMP^10050^1^(%29271RQEZ) HCV RNA QUANTITATIVE BDNA
TMP^10050^2^PPT TUBE OR PLASTIC SCREW-CAP VIAL
TMP^10050^3^(%37273RQEZ) HCV RNA QUALITATIVE TMA
TMP^10050^4^ORIGINAL, CENTRIFUGED, FROZEN PPT TUBE, PREFERRED
TMP^10050^5^PLASTIC SCREW-CAP VIAL CONTAINING PLASMA FROM STANDARD
TMP^10050^6^(EDTA) LAVENDER-TOP TUBE
TMP^10051^1^(%35645BRQEZ) HCV RNA QN REAL-TIME PCR
TMP^10051^2^PLASTIC SCREW CAP VIAL
TMP^10051^3^(%37590RQEZ) HCV RNA QL, TMA
TMP^10051^4^PLASTIC SCREW CAP VIAL
TMP^10054^1^PLASTIC SCREW-CAP VIAL
TMP^10061^1^PLASTIC SCREW CAP VIAL
TMP^10063^1^(%10063RQEZ) MYELIN ASSOC GLYCOPROTEIN (MAG) IGM AB BY WB
TMP^10063^2^PLASTIC SCREW CAP VIAL
TMP^10063^3^(%37078RQEZ) MYELIN ASSOC GLYCOPROTEIN (MAG)-SGPG AB (IGM)
TMP^10063^4^PLASTIC SCREW CAP VIAL
TMP^10063^5^(%37438RQEZ) MAG IGM ANTIBODY BY EIA
TMP^10063^6^PLASTIC SCREW CAP VIAL
TMP^10069^1^(%37658RQEZ) GENE TRANSLOCATION mcr QUANTITATIVE PCR
TMP^10069^2^STERILE SCREW CAP VIAL
TMP^10070^1^PLASTIC SCREW CAP VIAL
TMP^10071^1^PLASTIC SCREW CAP VIAL
TMP^10073^1^PPT VACUTAINER (PREFERRED) OR PLASTIC SCREW-CAP VIAL

TMP^10073^2^PLASTIC SCREW-CAP VIAL CONTAINING PLASMA FROM STANDARD
 TMP^10073^3^(EDTA) LAVENDER-TOP TUBE
 TMP^10084^1^PLASTIC SCREW CAP VIAL
 TMP^10087^1^(%10087RQEZ) ORGANIC ACIDS, QUALITATIVE, URINE
 TMP^10087^2^PLASTIC SCREW CAP VIAL
 TMP^10087^3^(%RQEZ10087) ORGANIC ACIDS, QUALITATIVE, URINE
 TMP^10087^4^PLASTIC SCREW CAP VIAL
 TMP^10097^1^PLASTIC SCREW CAP VIAL
 TMP^10098^1^PLASTIC SCREW CAP VIAL
 TMP^10104^1^(206RQEZ=) ACETYLCHOLINE RECEPTOR BINDING ANTIBODY
 TMP^10104^2^PLASTIC SCREW-CAP VIAL

Sample 3—Performing site codes

MSH|^~\&|OERDB|WDL|NEON||202406061237||MFN^PS|01|P|2.3
 WDL^0H^US^1^0^ATHENS REGIONAL MEDICAL CENTER^1199 PRINCE AVE^^ATHENS^GA^306062793^
 (706) 549-9977^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^
 WDL^AA^US^1^1^QUEST DIAGNOSTICS-MEDICAL PARK/LAUREL^4120 LAUREL STREET^SUITE
 #103^ANCHORAGE^AK^99508^907-563-3170^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^
 WDL^AAD^US^1^1^QUEST DIAGNOSTICS- ANNADALE PSC^3733 RICHMOND AVE.^^STATEN
 ISLAND^NY^10312^718-966-6701^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^DR. J.
 LASTNAME
 WDL^AAL^US^1^0^AEGIS ANALYTICAL LAB INC^345 HILL AVENUE^^NASHVILLE^TN^37210^615-255-
 2400^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^FIRSTNAME M. LASTNAME, PH.D.
 WDL^AAM^US^1^0^ANNE ARUNDEL MEDICAL CENTER^FRANKLIN & CATHEDRAL
 STS^^ANNAPOLIS^MD^21401^(410)267-
 1331^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^FIRSTNAME I. LASTNAME
 WDL^AAP^US^1^1^QUEST DIAGNOSTICS-ATLANTIC^AVIATION (READING)^R.D. 9, BOX
 9020^READING^PA^19605^(610)376-6333^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^
 WDL^AAS^US^1^1^QUEST DIAGNOSTICS ABELIA MEDICAL ASSOCIATES^711 E.
 HOUSTON^^BEEVILLE^TX^78102^361-881-3919^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^
 WDL^AB^US^1^1^QUEST DIAGNOSTICS-MEDICAL PARK LAB/NORTHERN^2211 E. NORTHERN LIGHTS
 BLVD^#210^ANCHORAGE^AK^99508^907-272-
 5475^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^FIRSTNAME LASTNAME, MD
 WDL^ABB^US^1^0^ABBEVILLE GENERAL HOSPITAL (PSC)^118 NORTH HOSPITAL
 DR^^ABBEVILLE^LA^70511^(318)893-5466^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^
 WDL^ABC^US^1^1^QUEST DIAGNOSTICS-ABSECON PSC^76 W PARK CENTRE^76 W JIMMIE LEEDS RD,
 STE 403^ABSECON^NJ^8201^609-652-9433^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^
 WDL^ABE^US^1^1^QUEST DIAGNOSTICS-WILLIS AVENUE ALBERTSON PSC^876 WILLIS
 AVENUE^^ALBERTSON^NY^11507^516-747-6464^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^
 WDL^ABG^US^1^0^ABINGTON HOSPITAL^1200 OLD YORK ROAD^^ABINGTON^PA^19001^(215)576-
 2000^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^
 WDL^ABH^US^1^0^ABINGTON MEMORIAL^HOSPITAL DEPT OF PATHOLOGY^1200 OLD YORK
 RD^ABINGTON^PA^19001^215-481-2352^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^
 WDL^ABI^US^1^0^ANALYTIC BIO-CHEMISTRIES^1680-D LORETTA
 AVENUE^^FEASTERVILLE^PA^19053^215-322-
 9210^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^DR FIRSTNAME LASTNAME
 WDL^ABL^US^1^1^QUEST DIAGNOSTICS- AMBLER PSC^500 WILLOW AVENUE^^AMBLER^PA^19002^215-
 641-8996^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^
 WDL^ABM^US^1^0^ALTA BATES MEDICAL CENTER^2450 ASHBY AVE^^BERKELEY^CA^94705^(510)540-
 1631^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^FIRSTNAME LASTNAME

WDL^ABN^US^1^1^QUEST DIAGNOSTICS-AUBURN PSC^3288 BELL RD.^AUBURN^CA^95603^(916)889-
8115^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^
WDL^ABO^US^1^0^QUEST DIAGNOSTICS-EXECUTIVE PARK DRIVE PSC^TWO EXECUTIVE PARK
DRIVE^^ALBANY^NY^12203^518-438-3388^0^0^REQLBL^NLSPECLBL^^NLSOLBL^NLCOMBO^N^^

Retrieving CDC dataset files via WebDAV

In order to ensure that the most current clinical data compendium (CDC) data is available to each Quest lab and EMR vendor, the Quantum Hub provides access to the CDC dataset files via WebDAV.

WebDAV enables the automated update and delivery of the data that is critical to driving vendor lab order applications. Always replace your existing CDC files with the new CDC files you download. This helps to ensure that your EMR/EHR applications are always using the most recent and accurate order entry information available so that the orders being sent to Quest are valid.

This section describes the process for accessing and retrieving the latest CDC dataset files using WebDAV. (For more information about WebDAV, refer to the WebDAV Resources website: <http://www.webdav.org/>.)

Retrieve CDC dataset files

1 In a browser, navigate to one of the following URLs:

- During the development process (prior to certification), access the CDC dataset files from the Certification environment, as shown below:

`https://certhubservices.quantum.com/webdav/cdc`

- After certification is complete, access the CDC dataset files from the Production environment, as shown below:

`https://hubservices.quantum.com/webdav/cdc`

2 When prompted, type your username and password (provided by Quest), and sign in.

The image shows a dark-themed sign-in dialog box. At the top, it says "Sign in to access this site" in white. Below that, it says "Authorization required by https://certhubservices.quantum.com" in a lighter color. There are two input fields: "Username" and "Password". At the bottom right, there are two buttons: "Sign in" (in blue) and "Cancel" (in grey).

Note: A separate username and password are provided for the Certification and Production environments.

The web folder for your corresponding Quest lab or EMR vendor appears in the web browser. Within that folder is a folder named *eDOS*, which contains the same reference data as the CDC dataset files but in HL7 2.6 file format. For information on the *eDOS* folder structure and the format of the HL7 files within it, see [Chapter 11, “eDOS laboratory test compendium framework” beginning on page 332](#).

- 3 To view the associated CDC dataset files, double-click the web folder (identified by a 3-digit code). The example below illustrates the contents of the top-level folder for the Quest Tampa lab, with a lab code of *TMP*.

Directory listing for /webdav/cdc/TMP

[Up To /webdav/cdc](#)

Filename	Size	Last Modified
eDOS/		Fri, 10 Nov 2023 18:58:05 GMT
AOE_STL.TXT	668.2 kb	Sat, 07 Oct 2023 22:41:51 GMT
BILL_TO_STL.TXT	39.8 kb	Sat, 07 Oct 2023 22:41:51 GMT
CONTAINER_STL.TXT	438.1 kb	Sat, 07 Oct 2023 22:41:51 GMT
CPTCODES_STL.TXT	126.9 kb	Sat, 07 Oct 2023 22:41:51 GMT
CPTICD10_STL.TXT	24107.2 kb	Sat, 07 Oct 2023 22:41:51 GMT
HEMOLYSIS_STL.TXT	148.7 kb	Sat, 07 Oct 2023 22:41:51 GMT
LIPEMIA_STL.TXT	95.1 kb	Sat, 07 Oct 2023 22:41:51 GMT
METHODOLOGY_STL.TXT	1354.7 kb	Sat, 07 Oct 2023 22:41:51 GMT
ORDCODE_STL.TXT	735.6 kb	Sat, 07 Oct 2023 22:41:51 GMT

- 4 From the web browser window, click the file to download it to your PC.

Chapter 11: eDOS laboratory test compendium framework

In this chapter:

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About the eDOS laboratory test compendium

The electronic exchange of Directory of Services (eDOS) Laboratory Test Compendium contains all of the reference data—for example, test codes, diagnostics codes, and Ask on Order Entry (AOE) questions—needed by an EMR/EHR to create complete and valid electronic orders for Quest Diagnostics labs.

You can retrieve the eDOS files from the Quantum Hub using Web-based Distributed Authoring and Versioning (WebDAV). For details, see [“Retrieving eDOS Files via WebDAV” on page 370](#).

Always replace your existing eDOS files with the new eDOS files you download. This helps to ensure that your EMR/EHR applications are always using the most recent and accurate order entry information available so that valid orders are being sent to Quest for processing.

Note: Use of the eDOS files requires vendor certification. For information on certification, contact your project manager.

eDOS file set

A complete set of eDOS files consists of the following HL7 2.6 messages:

- **M08 Master File Notification—Test/Observation.** This file lists all individually ordered tests. The tests listed in this file are referenced by M10 and M04 (see [“M10 Master File notification—Test/Observation Batteries” on page 338](#))
- **M10 Master File Notification—Test/Observation Batteries.** This file lists each orderable battery (eg, group test, panel, profile) and references the tests listed in M08 (see [“M08 Master File notification—Test/Observation” on page 337](#))
- **M04 Master File Notification—Charge Description.** Lists the *Current Procedural Terminology* (CPT) codes for orderable items. The CPT codes provide information for reference and administrative validation (such as Medical Necessity/ABN). This file references the tests and batteries listed in M08 and M10 (see [“M04 Master File notification—Charge Description” on page 339](#))

A complete, separate set of eDOS files is maintained for each Quest lab.

Types of eDOS file sets

Two types of eDOS file sets are available:

- **Full replacement set of files.** These are complete eDOS test compendium files that replace the existing test compendium. The full replacement eDOS files are updated daily and posted to WebDAV for you to retrieve and process. The set of full replacement files always consists of all 3 message types—M08, M10, and M04. The average size of each message is 4MB and the maximum is approximately 8.7MB
- **Incremental update files.** These are “maintenance” files that contain additions, deactivations, and/or updates to the eDOS test compendium. Unlike the full replacement files that consolidate all order codes and related information into the 3 message types, the incremental update files are provided per order code, and only the files related to the change are provided. Thus, depending on the changes, there could be an M08, M10, and M04 file for 1 order code but only an M08 file for another order code. The incremental update files are available via WebDAV as follows:
 - Emergency updates are posted daily, possibly multiple times per day
 - Scheduled updates are posted the first Monday of each month. As with the emergency updates, the scheduled updates provide only the changed files

Each incremental update file is available for 90 days before it is removed from the WebDAV folders.

Processing eDOS files

Regardless of whether you are processing a full replacement set of eDOS files or an incremental update set of eDOS files, the eDOS files **must** be processed in this order:

- 1 *M08 Master File Notification—Test/Observation*
- 2 *M10 Master File Notification—Test/Observation Batteries*
- 3 *M04 Master File Notification—Charge Description*

eDOS file names

eDOS files are named using the following structure:

Lab_MessageType_Timestamp_Number_Type.hl7

Where	Is
Lab	The 3-character identifier for a Quest lab.
MessageType	One of the following: M10, M08, or M04.
Timestamp	The date/time of message in the following format: yyyymmddhhmms s
Number	One of the following: <ul style="list-style-type: none">• For full replacements files, an integer that represents the version of the set of files, incremented by 1 each time the full set is replaced• For update files, a unique 6-digit number for each file
Type	<ul style="list-style-type: none">• REP indicates full replacement files• UPD indicates incremental update files

Example: AMD_M04_20240728142338_51_REP.hl7

eDOS message format requirements

Each eDOS message from a Quest lab adheres to the rules outlined in this section.

Message segment requirements

The following table describes the parameters used to define the message segments.

Parameter	Description
Required (Req'd)	Each segment is classified with 1 of the following requirement classifications: <ul style="list-style-type: none">• Required (R): The segment will be present in the eDOS messages• Optional (O): The segment may not be present in the eDOS messages, depending on whether or not the data is available• Conditional (C): The segment may or may not be present in the eDOS messages, depending on certain conditions
Cardinality	Each segment is classified with 1 of the following cardinality classifications: <ul style="list-style-type: none">• [0..1]: Optional but if present can occur only 1 time• [1..1]: Must occur 1 time• [0..n]: Optional but if present can occur up to <i>n</i> times• [1..n]: Must occur at least 1 time up to <i>n</i> times• [0..*]: Optional but if present can recur an unlimited number of times• [1..*]: Must occur at least 1 time and can recur an unlimited number of times

Segment delimiter

The eDOS HL7 messages use the carriage return (CR) character (ASCII 0x0D) to indicate the newline character/segment delimiter.

Field requirements

The following table describes the parameters used to define the data fields within each message segment.

Parameter	Description
Type	An HL7 standard data type as defined in the HL7 2.6 standards.
Length	The maximum length for the field. For repeating fields, the maximum length applies to 1 occurrence of the field.

Parameter	Description
Repeat	<p>One of the following:</p> <ul style="list-style-type: none"> • Yes (Y): The field can have repeating values • No (N): The field can have only 1 value
Required (Req'd)	<p>One of the following:</p> <ul style="list-style-type: none"> • Required (R): If the corresponding segment is present, the field will always be available in the eDOS message • Optional (O): The field may or may not have a value depending on the data available • Conditional But May Be Empty (CE): The field may or may not be populated depending on the conditions stipulated in the <i>Comments</i> column. However, even if those conditions are met, the field could still be empty • Not Supported (X): The field is not supported in these eDOS messages and thus no values will be present (the corresponding fields appear in <i>gray text</i> in the segment tables)

Field delimiters

Each field is delimited by a vertical bar (|). Even if a field contains no data, it is still delimited. The delimiter for any given HL7 message is always defined in the MSH segment of the message as the first character following the segment identifier in MSH.01 (*Field Separator*).

Standard HL7 delimiters are always used. These are defined in MSH.02 (*Encoding Characters*) as component separator (^), repetition separator (~), escape character (|), and sub-component separator (&).

M08 Master File notification—*Test/Observation*

The *M08—Test/Observation* message contains compendium information on all tests/observations.

Individual message segments are detailed in “M08, M10, and M04 master file notification segments” on page 340.

Message segment hierarchy

M08 messages adhere to the message segment hierarchy specified below:

Note: The OM2 and OM3 segments are supplied in the eDOS messages when applicable.

Segment ID	Req'd	Cardinality ^a	Description
MSH	R	[1..1]	Message header segment
MFI	R	[1..1]	<i>Master File Identification</i> segment
{	R	[1..*]	—Master File Test Begin—
MFE	R	[1..1]	<i>Master File Entry</i> segment
OM1	R	[1..1]	General segment (fields that apply to most observations)
OM2	O	[0..1]	Numeric observation segment
OM3	O	[0..1]	Categorical service/test/observation segment
[OM4]	O	[0..*]	Segment for observations that require specimens
}			—Master File Test End—

^aSee “Message segment requirements” on page 335 for an explanation of the cardinality classifications.

M10 Master File notification—*Test/Observation Batteries*

The *M10—Test/Observation Batteries* message contains compendium information on all grouped orderable items (eg, batteries, panels, profiles).

Individual message segments are detailed in “[M08, M10, and M04 master file notification segments](#)” on [page 340](#).

Message segment hierarchy

M10 messages adhere to the message segment hierarchy specified below:

Segment ID	Req'd	Cardinality ^a	Description
MSH	R	[1..1]	Message header segment
MFI	R	[1..1]	<i>Master File Identification</i> segment
{	R	[1..*]	—Master File Battery Begin—
MFE	R	[1..1]	<i>Master File Entry</i> segment
OM1	R	[1..1]	General segment (fields that apply to most observations)
{	R	[1..*]	—Battery Detail Begin—
OM5	R	[1..1]	Categorical service/test/observation segment
[{{OM4}}	O	[0..*]	Segment for observations that require specimens
}			—Battery Detail End—
}			—Master File Battery End—

^aSee “[Message segment requirements](#)” on [page 335](#) for an explanation of the cardinality classifications.

M04 Master File notification—*Charge Description*

The *M04—Charge Description* message contains the procedure codes (CPTs) that describe the billable activities performed with each orderable item.

Note: The Charge Description Master (CDM) segment does not support CPT modifiers to depict quantity (such as $\times 12$). Instead, the CDM segment repeats for each instance of a given CPT code to depict quantity.

Individual message segments are detailed in “[M08, M10, and M04 master file notification segments](#)” on the next page.

Message segment hierarchy

M04 messages adhere to the message segment hierarchy specified below:

Segment ID	Req'd	Cardinality ^a	Description
MSH	R	[1..1]	Message header segment
MFI	R	[1..1]	<i>Master File Identification</i> segment
{	R	[1..*]	—Master File CDM Begin—
MFE	R	[1..1]	<i>Master File Entry</i> segment
CDM	R	[1..*]	<i>Charge Description Master</i> segment
}			—Master File CDM End—

^aSee “[Message segment requirements](#)” on page 335 for an explanation of the cardinality classifications.

M08, M10, and M04 master file notification segments

This section provides detailed specifications for the segments in M08, M10, and M04 messages. The M08, M10, and M04 message segments include the following:

- “MSH—Message Header segment” on the next page
- “MFI—Master File Identification segment” on page 344
- “MFE—Master File Entry segment” on page 346
- “OM1—General segment (Fields that apply to most observations)” on page 347
- “OM2—Numeric Observation segment” on page 355
- “OM3—Categorical Service/Test/Observation segment” on page 357
- “OM4—Observations That Require Specimens segment” on page 358
- “OM5—Observation Batteries (Sets) segment” on page 360
- “CDM—Charge Description Master segment” on page 361

Field specifications

The following table describes the parameters used to define the data fields within each message segment.

Parameter	Description
Required	<p>The fields within each segment are classified based on their requirement status of Required (R), Optional (O), Conditional (C), or Not Supported (X) as defined below:</p> <ul style="list-style-type: none">• Required. If the corresponding segment is present, the field must also be present within the segment, and the Quantum Hub validates it against any stated requirements. If the field is not present, the message is rejected by the Quantum Hub• Optional. The field is not required; the segment is accepted by the Quantum Hub whether or not this field is present. If the field is present, the Quantum Hub validates it against any stated requirements (The contents of this field will not be reflected in the lab result)• Conditional. The field may or may not be required, depending on certain conditions (stipulated in the <i>Comments</i> column of each segment table). If the stated conditions are not met, the message is rejected by the Quantum Hub. If the field is present, the Quantum Hub validates it against any stated requirements (The contents of this field may or may not be reflected in the lab result)• Not Supported. If a field is described as <i>Not Supported</i> (the corresponding fields appear in <i>gray text</i> in the table), the content of the field is not used by the lab
Type	An HL7 standard data type.
Length	The maximum allowed length for the field.
Repeat	<p>Each field is classified with 1 of the following values:</p> <ul style="list-style-type: none">• N: May not repeat• Y: May repeat any number of times• Y/n: May repeat up to <i>n</i> times

MSH—Message Header segment

All master file messages contain the MSH segment. It appears only once in each message. For the *Quest Clinical Data Compendium* (CDC), the MSH segment identifies the Quest lab and associated *Clinical Laboratory Improvement Amendments* (CLIA) number, your account number, the message type (M08, M10, or M04), message control ID, processing rules, and HL7 version.

The MSH segment is **required** for M08, M10, and M04.

Field	Name	Type	Length	Repeat	Req'd	Comments
MSH.00	Segment Identifier	ST	4	N	R	This is MSH.
MSH.01	Field Separator	ST	1	N	R	The separator between the message segment type ID and the first data field (MSH.02). This also defines the character to be used as a separator for the rest of the message. The value is a vertical bar ().
MSH.02	Encoding Characters	ST	4	N	R	The following characters may be used: <ul style="list-style-type: none">• ^ (component separator)• ~ (repetition separator)• \ (escape character)• & (sub-component separator)
MSH.03	Sending Application	HD	227	N	R	The 3-character lab ID for the lab associated with this eDOS message (eg, WDL).
MSH.04	Sending Facility	HD	227	N	R	The CLIA number for the lab associated with this eDOS message, formatted as: <Namespace ID (IS)> ^ <Universal ID (ST)> ^ <Universal ID Type (ID)> For example: ^11A1234567^CLIA
MSH.05	Receiving Application				X	
MSH.06	Receiving Facility				X	

Field	Name	Type	Length	Repeat	Req'd	Comments
MSH.07	Date/Time of Message	DTM	24	N	R	<p>The date and time that the lab created the eDOS message, formatted as:</p> <p>yyyymmddhhmmss</p> <p>where <i>hhmmss</i> is Greenwich Mean Time (GMT).</p> <p>For example:</p> <p>20240811121700</p>
MSH.08	Security				X	
MSH.09	Message Type	MSG	15	N	R	<p>The type of message being transmitted, and the event leading to the creation of the message.</p> <p>Possible values are:</p> <p>MFN^M08^MFN_M08</p> <p>MFN^M10^MFN_M10</p> <p>MFN^M04^MFN_M04</p>
MSH.10	Message Control ID	ST	199	N	R	<p>A number or other data that uniquely identifies the message.</p> <p>Full replacement files are formatted as follows:</p> <p>messagetypeLab_ yyyymmddhhmmss</p> <ul style="list-style-type: none"> • <i>messagetype</i> is M04, M08, or M10 • <i>Lab</i> is the three-letter code for a Quest lab • <i>hhmmss</i> is expressed in GMT <p>For example:</p> <p>M08TMP_20240306031336</p> <p>Incremental update files are formatted as follows:</p> <p>nnnnnn, where <i>nnnnnn</i> is the same unique number used in the message file name</p>

Field	Name	Type	Length	Repeat	Req'd	Comments
						For example: 123456
MSH.11	Processing ID	PT	3	N	R	This sets the processing rules for your system. This is Production (P) and Current Processing (T) for eDOS messages, formatted as: Processing ID^Processing Mode For example: P^T
MSH.12	Version ID	VID	60	N	R	Enter your version number to make sure the message is processed correctly. For eDOS messages, the version is 2.6.
MSH.13	Sequence Number				X	
MSH.14	Continuation Pointer				X	
MSH.15	Accept Acknowledgment Type	ID	2	N	R	This identifies the acknowledgment requirements at the communication level (that the message has been received). This is AL (always).
MSH.16	Application Acknowledgment Type	ID	2	N	R	This identifies the acknowledgment requirements at the application level (that the message has been processed). This is NE (never).
MSH.17	Country Code	ID	3	N	R	The country of origin for the eDOS message. This is USA.
MSH.18	Character Set				X	

Field	Name	Type	Length	Repeat	Req'd	Comments
MSH.19	Principal Language of Message				X	
MSH.20	Alternate Character Set Handling Scheme				X	
MSH.21	Message Profile Identifier	EI	427	N	R	This identifies the message as an implementation of <i>ACLA DOS</i> version 1.0. This is <code>ACLA_DOS_V1.0</code> .
MSH.22	Sending Responsible Organization				X	
MSH.23	Receiving Responsible Organization				X	
MSH.24	Sending Network Address				X	
MSH.25	Receiving Network Address				X	

MFI—Master File Identification segment

All master file messages contain the MFI segment. It appears only once in each message. For the Quest CDC, the MFI segment identifies the type of master file (such as *Observation batteries* or *Charge description*), whether the file is a full replacement or incremental update, and whether or not a response to the message is required.

The MFI segment is **required** for M08, M10, and M04.

Field	Name	Type	Length	Repeat	Req'd	Comments
MFI.00	Segment Identifier	ST	4	N	R	This is <code>MFI</code> .
MFI.01	Master File Identifier	CWE	250	N	R	This identifies the HL7 master file type for this message, formatted as: Identifier^Text^Name of Coding System For example: M08 and M10 files:

Field	Name	Type	Length	Repeat	Req'd	Comments
						<p>OMC^Observation batteries master file^HL7 Table 0175</p> <p>M04 files:</p> <p>CDM^Charge description master file^HL7 Table 0175</p>
MFI.02	Master File Application Identifier				X	
MFI.03	File-Level Event Code	ID	3	N	R	<p>This defines the file-level event code, indicating whether you must replace (REP) the existing data or update (UPD) the existing data.</p> <ul style="list-style-type: none"> • REP = Full (replacement) update • UPD = Incremental update <p>When MFI.03 is REP (full replacement), MFE.01 (Record-Level Event Code) is MAD (add record to master file) for every MFE segment.</p>
MFI.04	Entered Date/Time				X	
MFI.05	Effective Date/Time				X	
MFI.06	Response Level Code	ID	2	N	R	<p>This specifies the application response level in combination with MSH.16 (Application Acknowledgment Type).</p> <p>This is always NE, indicating that no response is necessary.</p>

MFE—Master File Entry segment

All master file messages contain the MFE segment. It appears in all message types (M08, M10, and M04), once for each order code. For the Quest CDC, the MFE segment identifies the order code and if it should be added to the CDC, updated, deactivated, or reactivated. The OM1 through OM5 segments contain additional information about each order code.

The MFE segment is **required** for M08, M10, and M04.

Field	Name	Type	Length	Repeat	Req'd	Comments
MFE.00	Segment Identifier	ST	4	N	R	This is MFE.
MFE.01	Record-Level Event Code	ID	3	N	R	<p>This specifies how to handle the database record:</p> <ul style="list-style-type: none"> • MAD = Add • MUP = Update • MDC = Deactivate • MAC = Reactivate <p>Note: If MFI.03 (File-Level Event Code) is REP (replace file), each MFE segment will have an MFE.01 value of MAD, indicating that the record must be added.</p>
MFE.02	MFN Control ID				X	
MFE.03	Effective Date/Time				X	
MFE.04	Primary Key Value - MFE	Varies	200	Y	R	<p>Quest does not supply repeating values for MFE.04.</p> <p>For M08 message types: This uniquely identifies the reportable analyte. This primary key value includes both the Quest analyte result code and the LOINC result code.</p> <p>For M10 message types: This uniquely identifies the orderable panel or profile.</p> <p>For M04 message types: This uniquely identifies the analyte (if single), orderable panel, or profile.</p> <p>This segment is formatted as follows:</p> <p>For M08 message types:</p>

Field	Name	Type	Length	Repeat	Req'd	Comments
						Identifier^Text^Name of Coding System^Alternate Identifier^Alternate Text^Name of Alternate Coding System For M10 and M04 message types: Identifier^Text^Name of Coding System For example: For M08 message types: 42730^HEPATITIS B CORE Ab^99QDI^16933-4^Hepatitis B virus core Ab^LN For M10 and M04 message types: 42704^HEPATITIS PANEL I^99QDI
MFE.05	Primary Key Value Type	ID	3	Y	R	This contains the HL7 data type of the value in MFE.04 (<i>Primary Key Value</i>). This is always <i>CWE</i> (coded with exceptions).
MFE.06	Entered Date/Time				X	
MFE.07	Entered By				X	

OM1—General segment (Fields that apply to most observations)

The OM1 segment provides the details for the order code in the MFE segment such as:

- whether or not a specimen is required
- criteria for rejecting a specimen
- a description of the methodology
- preferred long names and synonyms/aliases

The OM1 segment is **required** for M08 and M10.

Field	Name	Type	Length	Repeat	Req'd	Comments
OM1.00	Segment Identifier	ST	4	N	R	This is OM1.
OM1.01	Sequence Number - Test/Observation Master File	NM	4	N	R	The sequence number for all OM1 segments within an M08 or M10 message.

Field	Name	Type	Length	Repeat	Req'd	Comments
						The sequence number starts with 1 for the first OM1 segment in each message type.
OM1.02	Producer's Service/Test/Observation ID	CWE	250	N	R	<p>For M08 message types:</p> <p>This contains the Quest order code and is populated even for non-orderable components of a panel or profile.</p> <p>For M10 message types:</p> <p>This contains the Quest order code for the panel or profile listed in MFE.04 (Primary Key Value).</p> <p>The field is formatted as follows:</p> <p>Primary Identifier for the Laboratory Order Code^Official Name given by Receiver of Order for this Lab Test^Lab ID</p> <p>For example:</p> <p>For M08 message types:</p> <p>249^Antinuclear Antibody^99QDI</p> <p>For M10 message types:</p> <p>6399^HEPATITIS PANEL I^99QDI</p>
OM1.03	Permitted Data Types				X	
OM1.04	Specimen Required	ID	1	N	R	<p>This specifies whether or not a specimen is required.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> Y = The test identified in OM1.02 requires a specimen N = The test identified in OM1.02 does not require a specimen <p>Note: This is Y for all tests in the M10 message.</p>

Field	Name	Type	Length	Repeat	Req'd	Comments
OM1.05	Producer ID	CWE	250	N	R	<p>The CLIA number of the lab from which the eDOS message was created.</p> <p>The field is formatted as follows:</p> <p>Identifier^Text^Name of Coding System</p> <p>For example:</p> <p>05D0644209^Quest Diagnostics Chicago^CLIA</p>
OM1.06	Observation Description				X	
OM1.07	Other Service/Test/ Observation IDs for the Observation				X	
OM1.08	Other Names				X	
OM1.09	Preferred Report Name for the Observation				X	
OM1.10	Preferred Short Name or Mnemonic for Observation				X	
OM1.11	Preferred Long Name for the Observation	ST	200	N	R	<p>The reportable name of the result value.</p> <p>For example:</p> <p>For M08 message types:</p> <p>Anti-Nuclear Antibody by Immunoassay (ANA)</p> <p>For M10 message types:</p> <p>Complete Blood Count w/Differential</p>
OM1.12	Orderability	ID	1	N	R	<p>This specifies whether or not the service, test, or observation in OM1.02 is an orderable code.</p> <ul style="list-style-type: none"> Y = The test identified in OM1.02 is orderable

Field	Name	Type	Length	Repeat	Req'd	Comments
						<ul style="list-style-type: none"> N = The test identified in OM1.02 is not orderable. This usually indicates that the test is part of a panel or profile <p>Note: Panels or profiles may be non-orderable if they are reflex tests only.</p>
OM1.13	Identity of Instrument Used to Perform this Study				X	
OM1.14	Coded Representation of Method				X	
OM1.15	Portable Device Indicator				X	
OM1.16	Observation Producing Department/Section				X	
OM1.17	Telephone Number of Section				X	
OM1.18	Nature of Service/Test/Observation	IS	1	N	R	<p>This field indicates if this is a test battery, procedure or study, a single test (observation), a profile, or an observation compiled from other observations.</p> <p>For M08 message types:</p> <p>This contains A (which stands for atomic service, test, or observation), signifying that this OM1 identifies a single component result.</p> <p>If OM1.12 (Orderability) contains Y, then this is also a single component orderable.</p> <p>For M10 message types:</p> <p>This contains 1 of the following:</p>

Field	Name	Type	Length	Repeat	Req'd	Comments
						<ul style="list-style-type: none"> • P = The test in MFE.04 (<i>Primary Key Value</i>) is a panel for all OM1s within an M10 segment • S = The test in MFE.04 (<i>Primary Key Value</i>) is a profile for all OM1s within an M10 segment
OM1.19	Report Subheader				X	
OM1.20	Report Display Order				X	
OM1.21	Date/Time Stamp for any change in Definition for the Observation				X	
OM1.22	Effective Date/Time of Change				X	
OM1.23	Typical Turn-around Time				X	
OM1.24	Processing Time				X	
OM1.25	Processing Priority				X	
OM1.26	Reporting Priority				X	
OM1.27	Outside Site(s) Where Observation May Be Performed	CWE	250	Y	CE	<p>If the component identified in OM1.02 (<i>Producer's Service/Test/Observation ID</i>) is performed in a site other than the site listed in OM1.05 (<i>Producer ID</i>), then this field contains the CLIA number for the performing site.</p> <p>This field is formatted as follows:</p> <p>Identifier^Text^Name of Coding System</p> <p>For example:</p> <p>03E0744501^Specialty^CLIA</p>

Field	Name	Type	Length	Repeat	Req'd	Comments
OM1.28	Address of Outside Site(s)	XAD	250	Y	CE	<p>If the component identified in OM1.02 (Producer's Service/Test/Observation ID) is performed in a site other than the site listed in OM1.05 (Producer ID), then this field contains the address for the performing site.</p> <p>This field is formatted as follows:</p> <pre>Street or Mailing Address&Street Name&Dwelling Number^Other Designation^City^State or Province^Zip or Postal Code^Country</pre> <p>For example:</p> <pre>4690 Parkway Drive^^Mason^OH^45150</pre>
OM1.29	Phone Number of Outside Site				X	
OM1.30	Confidentiality Code				X	
OM1.31	Observations Required to Interpret the Observation	CWE	250	Y	O	<p>For M08 message types:</p> <p>This field is always empty.</p> <p>For M10 message types:</p> <p>This contains the AOE questions for panels/profiles that require them, formatted as follows:</p> <pre><identifier (ST)> ^ <text (ST)> ^ <name of coding system (ID)> ^ <alternate identifier (ST)> ^ <alternate text (ST)> ^ <name of alternate coding system (ID)> ^ <coding system version ID (ST)> ^ alternate coding system version ID (ST)> ^ <original text (ST)></pre>

Field	Name	Type	Length	Repeat	Req'd	Comments
						<p>For example:</p> <p>SOURCE^SPECIMEN SOURCE: ^99QDI~AGE DOB^DONOR AGE: EGG RETRIEVAL ^99QDI</p>
OM1.32	Interpretation of Observations	TX	65536	Y	0	<p>This field contains clinical significance data, additional notes, and compliance remarks.</p> <p>For example:</p> <p>The American Medical Association suggests weekly testing of warfarin levels.</p>
OM1.33	Contraindications to Observations	CWE	250	Y	0	This field contains limitations or contraindications that may affect the observation.
OM1.34	Reflex Tests/ Observations				X	
OM1.35	Rules that Trigger Reflex Testing				X	
OM1.36	Fixed Canned Message				X	
OM1.37	Patient Preparation	TX	200	N	0	<p>This field contains any patient preparation required prior to collecting the specimen(s) for this observation.</p> <p>For example:</p> <p>Patient fasting required for 12 hours.</p>
OM1.38	Procedure Medication				X	
OM1.39	Factors that May Affect the Observation	TX	200	N	0	<p>This field contains information such as causes for rejection. Three examples are:</p> <p>Hemolized</p> <p>QNS (Quantity Not Sufficient)</p> <p>Clotted</p>

Field	Name	Type	Length	Repeat	Req'd	Comments
OM1.40	Service/Test/ Observation Performance Schedule	ST	60	Y	0	This field contains the days of the week on which the test listed in OM1.02 (Producer's Service/Test/Observation ID) is performed. For example: Mon, Wed, Fri
OM1.41	Description of Test Methods	TX	65536	Y	0	This field contains the text description of the methods used to perform the test and generate the observations. Bibliographic citations may be included.
OM1.42	Kind of Quantity Observed				X	
OM1.43	Point Versus Interval				X	
OM1.44	Challenge Information				X	
OM1.45	Relationship Modifier				X	
OM1.46	Target Anatomic Site Of Test				X	
OM1.47	Modality Of Imaging Measurement				X	
OM1.48	Exclusive Test				X	
OM1.49	Diagnostic Serv Sect ID (ID)				X	

Field	Name	Type	Length	Repeat	Req'd	Comments
OM1.50	Taxonomic Classification Code				X	
OM1.51	Other Names	ST	200	Y	0	<p>This field contains any test aliases or synonyms for the name listed in OM1.02 (<i>Producer's Service/ Test/Observation ID</i>).</p> <p>For example:</p> <p>OM1.02 might be Pregnancy Test and the alias in OM1.51 might be Preg Test.</p>

OM2—Numeric Observation segment

The OM2 segment provides the details for order codes whose observations are atomic. Observations are atomic when [OM1.18](#) (*Nature of Service/Test/Observation*) = A (atomic service/test/observation). It contains the unit of measure and the various ranges for the observation.

The OM2 segment is optional in M08 and supplied when applicable. It is not used in M10 and M04 messages.

Field	Name	Type	Length	Repeat	Req'd	Comments
OM2.00	Segment Identifier	ST	4	N	R	This is OM2.
OM2.01	Sequence Number - Test/Observation Master File	NM	4	N	R	<p>This is the same as the associated OM1.01 sequence number.</p> <p>For example:</p> <p>OM1 2852 ...</p> <p>OM2 2852 ...</p>
OM2.02	Units of Measure	CWE	250	N	0	<p>This contains the units of measure associated with the result identified in the MFE.04 (<i>Primary Key Value</i>), formatted as:</p> <p>Identifier^Text^Name of Coding System</p> <p>For example:</p> <p>mg/dl^mg/dl^99QDI</p>

Field	Name	Type	Length	Repeat	Req'd	Comments
OM2.03	Range of Decimal Precision				X	
OM2.04	Corresponding SI Units of Measure				X	
OM2.05	SI Conversion Factor				X	
OM2.06	Reference (Normal) Range for Ordinal and Continuous Observations	RFR	250	Y	0	<p>This field contains repeating sex-, age-, and race-specific normal ranges, formatted as:</p> <p>Numeric Range^Administrative Sex^Age Range^^Race</p> <p>For example:</p> <p>10-20^F^0-15Y~10-50^F^16-100Y</p>
OM2.07	Critical Range for Ordinal and Continuous Observations				X	
OM2.08	Absolute Range for Ordinal and Continuous Observations				X	
OM2.09	Delta Check Criteria				X	
OM2.10	Minimum Meaningful Increments				X	

OM3—Categorical Service/Test/Observation segment

The OM3 segment provides free-text details for observations that are non-numeric. The OM3 segment is optional in M08 and supplied when applicable. It is not used in M10 and M04.

Field	Name	Type	Length	Repeat	Req'd	Comments
OM3.00	Segment Identifier	ST	4	N	R	This is OM3.
OM3.01	Sequence Number - Test/Observation Master File	NM	4	N	R	This is always the same as the associated OM1.01 sequence number. For example: OM1 2852 ... OM3 2852 ...
OM3.02	Preferred Coding System				X	
OM3.03	Valid Coded "Answers"				X	
OM3.04	Normal Text/Codes for Categorical Observations	CWE	250	Y	0	This field contains the result (s) that are expected to be normal for the result listed in MFE.04 (Primary Key Value) , formatted as: Identifier^Text^Name of Coding System For example: N^Negative^99QDI
OM3.05	Abnormal Text/Codes for Categorical Observations	CWE	250	Y	0	This field contains the result (s) that are expected to be abnormal for the result listed in MFE.04 (Primary Key Value) , formatted as: Identifier^Text^Name of Coding System For example: P^Positive^99QDI
OM3.06	Critical Text/Codes for Categorical Observations				X	
OM3.07	Value Type				X	

OM4—Observations That Require Specimens segment

The OM4 segment provides the details for order codes that require specimens (eg, specimen volumes, containers, additives and preparation).

The OM4 segment is optional in M08 and M10 and not used in M04.

Field	Name	Type	Length	Repeat	Req'd	Comments
OM4.00	Segment Identifier	ST	4	N	R	This is OM4.
OM4.01	Sequence Number - Test/Observation Master File	NM	4	N	R	<p>This contains the same value as OM1.01 unless more than 1 OM4 is associated with the same OM1.</p> <p>In that case the OM4.01 includes a number after the decimal point to make the sequence number unique.</p> <p>For example:</p> <p>OM1 2852 ...</p> <p>OM4 2852 . 1 ...</p> <p>OM4 2852 . 2 ...</p>
OM4.02	Derived Specimen				X	
OM4.03	Container Description	TX	60	Y	O	<p>For M08 message types:</p> <p>For single order codes, this contains the description(s) of the transport container(s) to be used for collection of the specimen. If a single resultable test has multiple preferred containers, OM4.03 repeats.</p> <p>For analytes, this field is blank.</p> <p>For example:</p> <p>Red-Top Tube~Gel-Barrier Tube</p> <p>For M10 message types:</p> <p>This is always empty.</p>
OM4.04	Container Volume				X	
OM4.05	Container Units				X	

Field	Name	Type	Length	Repeat	Req'd	Comments
OM4.06	Specimen				X	
OM4.07	Additive				X	
OM4.08	Preparation	TX	10240	N	O	<p>This contains any special processing requirements for the test listed in OM1.02 (<i>Producer's Service/Test/Observation ID</i>).</p> <p>For example:</p> <p>Add acidifying tablets before sending.</p>
OM4.09	Special Handling Requirements				X	
OM4.10	Normal Collection Volume				X	
OM4.11	Minimum Collection Volume				X	
OM4.12	Specimen Requirements	TX	10240	N	O	<p>This contains the other specimen delivery and special handling instructions for the test listed in OM1.02 (<i>Producer's Service/Test/Observation ID</i>).</p> <p>For example:</p> <p>Remove plasma from cells within one hour of collection.</p>
OM4.13	Specimen Priorities				X	
OM4.14	Specimen Retention Time				X	
OM4.15	Specimen Handling Code	CWE	250	N	O	<p>This contains the specimen transport temperature requirements, formatted as:</p> <p>Identifier^Text^Name of Coding System</p> <p>For example:</p> <p>FRZ^Frozen^99QDI</p>

Field	Name	Type	Length	Repeat	Req'd	Comments
OM4.16	Specimen Preference	ID	2	N	O	For M08 message types: This is always empty. For M10 message types: This is always P (preferred specimen).
OM4.17	Preferred Specimen Sequence Number				X	

OM5—Observation Batteries (Sets) segment

The OM5 segment provides the details for order codes whose observations are panels (OM1.18 = P) or profiles (OM1.18 = S). It lists an individual item for the specified panel or profile, repeating until all of the corresponding items are listed.

The OM5 segment is used only in M10.

Field	Name	Type	Length	Repeat	Req'd	Comments
OM5.00	Segment Identifier	ST	4	N	R	This is OM5.
OM5.01	Sequence Number - Test/Observation Master File	NM	4	N	R	This contains the same value as OM1.01 (Sequence Number - Test/Observation Master File).
OM5.02	Test/Observations Included within an Ordered Test Battery	CW E	250	Y	R	This contains the <i>Primary Key</i> (MFE.04) values for all components of a panel or profile from the M08 and M10 segment. Profiles list the panel <i>Primary Key Values</i> contained within the profile, not each individual component of those included panels. This field is formatted as follows: Identifier^Text^Name of Coding System For example: 402^Electrolytes^99QDI~352^Urinalysis^99QDI~44534788^WBC^99QDI
OM5.03	Observation ID Suffixes				X	

CDM—Charge Description Master segment

The CDM segment provides the CPT code assigned to each order code listed in the MFE segment. CPT modifiers that depict quantity (such as x12) are not supported, so the CDM segment repeats for each instance of a given CPT code.

The CDM segment is used only in M04.

Field	Name	Type	Length	Repeat	Req'd	Comments
CDM.00	Segment Identifier	ST	4	N	R	This is CDM.
CDM.01	Primary Key Value - CDM	CWE	250	N	R	<p>This field uniquely identifies the orderable code and matches the MFE key value (MFE.04) in the MFE segment immediately preceding this CDM segment.</p> <p>This field is formatted as follows:</p> <p>Identifier^Text^Name of Coding System</p> <p>For example:</p> <p>1520^Chem 4 Panel^99QDI</p>
CDM.02	Charge Code Alias				X	
CDM.03	Charge Description Short				X	
CDM.04	Charge Description Long				X	
CDM.05	Description Override Indicator				X	
CDM.06	Exploding Charges				X	
CDM.07	Procedure Code	CNE	705	Y	R	<p>This is a repeating list of CPT codes assigned to the orderable test listed in the <i>Primary Key Value</i> (CDM.01), formatted as follows:</p> <p>Identifier^^Name of Coding System</p> <p>For example:</p> <p>83516^^C5~83516^^C5~86255^^C-5</p>

Field	Name	Type	Length	Repeat	Req'd	Comments
						83516^^C5&83516^^C5&86255^^C-5
CDM.08	Active/Inactive Flag				X	
CDM.09	Inventory Number				X	
CDM.10	Resource Load				X	
CDM.11	Contract Number				X	
CDM.12	Contract Organization				X	
CDM.13	Room Fee Indicator				X	

Sample eDOS dataset files

The following are sample eDOS files for full replacement files and for incremental update files.

Replacement files

The following sample files are from the Atlanta (SKB) lab. Because full replacement file can be very large (over 8,000 segments) each sample is a subset of a full replacement file.

Sample 1—M08 Master file notification – Test/Observation

The following M08 sample message shows 10 sets of OM1 and associated OM2, OM3, and OM4 segments.

```
MSH|^~\&|SKB|^11D0255931^CLIA|||20240112201847||MFN^M08^MFN_M08|M08SKB_
20240112201847|P^T|2.6||AL|NE||||ACLA_DOS_V1.0||||
MFI|OMC^Observation batteries master file^HL7 0175||REP|||NE
MFE|MAD|||86004008^N TELOPEPTIDE, SERUM^99QDI|CWE||
OM1|1|59245^N TELOPEPTIDE, SERUM^99QDI||Y|11D0255931^Atlanta^CLIA|||||N
TELOPEPTIDE, SERUM|Y|||||A|||||||^QUEST DIAGNOSTICS NICHOLS INSTITUTE
VALENCIA,CA^CLIA|27027 TOURNEY ROAD^^VALENCIA^CA^91355-5386^|||||||ENZYME
IMMUNOASSAY (EIA)|||||||
OM4|1.1||PLASTIC SCREW-CAP VIAL|||||||1 ML SERUM INSTRUCTIONS: COLLECTED WHOLE
BLOOD BY STANDARD VENIPUNCTURE TECHNIQUE. ALLOW BLOOD TO FULLY CLOT AND REMOVE THE
SERUM FROM THE CLOT PROMPTLY. SPECIMENS COLLECTED IN SERUM SEPARATOR TUBES (SST)
SHOULD BE CENTRIFUGED AND SERUM REMOVED FROM THE GEL SEPARATOR INTO A DIFFERENT TUBE
AND SHIPPED. SPECIMENS SENT IN AN SST TUBE WILL BE REJECTED. PLASMA SAMPLES WILL
ALSO BE REJECTED.||R^null^99QDI||
MFE|MAD|||85732400^GASTRIN RELEASING PEPTIDE^99QDI^2329-1^Gastrin releasing poly-
peptide^LN|CWE||
OM1|2|8512^GASTRIN RELEASING PEPTIDE^99QDI||Y|11D0255931^Atlanta^CLIA|||||GASTRIN
RELEASING PEPTIDE|Y|||||A|||||||^UNIVERSITY REFERENCE LABORATORY^CLIA|410 W 10TH
AVENUE^DOAN HALL 310^COLUMBUS^OH^43210-1240^|||||||
OM2|2|pg/mL^pg/mL^99QDI|||||||
OM4|2.1||PLASTIC SCREW CAP VIAL|||||||2 ML PLASMA ***FROZEN*** COLLECT BLOOD IN
CHILLED EDTA (LAVENDER TOP) TUBE. CENTRIFUGE IMMEDIATELY, SEPARATE PLASMA FROM RED
CELLS AND FREEZE PLASMA IN A PLASTIC VIAL. SHIP FROZEN ON AT LEAST 5 POUNDS OF DRY
ICE. PLAN YOUR SHIPMENT TO ARRIVE ON A WEEKDAY.||R^null^99QDI||
MFE|MAD|||85136100^DANTROLENE^99QDI^9746-9^Dantrolene^LN|CWE||
OM1|3|6100^DANTROLENE^99QDI||Y|11D0255931^At-
lanta^CLIA|||||DANTROLENE|Y|||||A|||||||^NMS LABS^CLIA|3701 WELSH ROAD^^WILLOW
GROVE^PA^19090-0437^|||||||SPECTROFLUOROMETRY|||||||
OM2|3|mcg/mL^mcg/mL^99QDI|||||||
OM4|3.1||EDTA (LAVENDER-TOP)TUBE|||||||1 ML SERUM INSTRUCTIONS: PROMPTLY
CENTRIFUGE AND SEPARATE SERUM OR PLASMA INTO A PLASTIC SCREW-CAPPED
VIAL.||R^null^99QDI||
MFE|MAD|||85988280^G-6-PD, RBC^99QDI^32546-4^Glucose-6-Phosphate dehyd-
rogenase^LN|CWE||
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OM1|4|500^Glucose-6-Phosphate Dehydrogenase, Quantitative^99QDI||Y|11D0255931^Atlanta^CLIA|||||Glucose-6-Phosphate Dehydrogenase, Quantitative|Y|||||A|||||||^QUEST DIAGNOSTICS NICHOLS INSTITUTE CHANTILLY^CLIA|14225 NEWBROOK DRIVE^^CHANTILLY^VA^20151-2228^|||||||Received frozen|Set up: Mon-Fri; Report available: 4 days|Kinetic|||||||G-6-PD~G-6-PD OM4|4.1||EDTA (lavender-top) tube|||||||1 mL whole blood collected in an EDTA (lavender-top) tube||R^null^99QDI||

MFE|MAD|||85990530^MAGNESIUM, RBC^99QDI^26746-8^Magnesium^LN|CWE||

OM1|5|623^Magnesium, RBC^99QDI||Y|11D0255931^Atlanta^CLIA|||||Magnesium, RBC|Y|||||A|||||||^QUEST DIAGNOSTICS NICHOLS INSTITUTE CHANTILLY^CLIA|14225 NEWBROOK DRIVE^^CHANTILLY^VA^20151-2228^|||||||Received room temperature ;Received frozen|Set up: Mon-Fri p.m.; Report available: 5 days|Atomic Absorption (AA)|||||||

OM4|5.1||Plastic screw-cap vial|||||Patient should refrain from taking vitamins, or mineral herbal supplements for at least one week before sample collection. Do not centrifuge whole blood.||||1 mL whole blood collected in an EDTA (lavender-top) tube, Patient should refrain from taking vitamins, or mineral herbal supplements for at least one week before sample collection. Do not centrifuge whole blood.||R^null^99QDI||

MFE|MAD|||85111000^CHLORTHALIDONE, URINE^99QDI^3479-3^Chlorthalidone^LN|CWE||

OM1|6|3193^CHLORTHALIDONE, URINE^99QDI||Y|11D0255931^Atlanta^CLIA|||||CHLORTHALIDONE, URINE|Y|||||A|||||||^NMS LABS^CLIA|3701 WELSH ROAD^^WILLOW GROVE^PA^19090-0437^|||||||HIGH PRESSURE LIQUID CHROMATOGRAPHY|||||||

OM2|6|mcg/mL^mcg/mL^99QDI|||||||

OM4|6.1||PLASTIC URINE CONTAINER|||||||1 ML URINE||R^null^99QDI||

MFE|MAD|||86004741^COENZYME Q10^99QDI^27923-2^Ubiquinone 10^LN|CWE||

OM1|7|19826^COENZYME Q10^99QDI||Y|11D0255931^Atlanta^CLIA|||||COENZYME Q10|Y|||||A|||||||^QUEST DIAGNOSTICS NICHOLS INSTITUTE CHANTILLY^CLIA|14225 NEWBROOK DRIVE^^CHANTILLY^VA^20151-2228^|||||||HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)|||||||

OM4|7.1||PLASTIC SCREW-CAP VIAL|||||||PATIENT PREPARATION: PATIENT SHOULD FAST 10-12 HOURS PRIOR TO COLLECTION. PATIENT MAY HAVE WATER. IT IS NOT NECESSARY TO DISCONTINUE NUTRITIONAL SUPPLEMENTS PRIOR TO THIS TEST. 0.5 ML SERUM COLLECTED IN A RED-TOP TUBE (NO GEL) INSTRUCTIONS: SEND IN AN AMBER VIAL OR WRAP A CLEAR, PLASTIC SCREW-CAP VIAL IN FOIL. PROTECT FROM LIGHT.||R^null^99QDI||

MFE|MAD|||85989600^CARDIOLIPIN AB SCREEN^99QDI^29860-4^Cardiolipin Ab^LN|CWE||

OM1|8|36172^Cardiolipin Antibody Screen with Reflex to IgG and IgM^99QDI||Y|11D0255931^Atlanta^CLIA|||||Cardiolipin Antibody Screen with Reflex to IgG and IgM|Y|||||A|||||||^QUEST DIAGNOSTICS NICHOLS INSTITUTE CHANTILLY^CLIA|14225 NEWBROOK DRIVE^^CHANTILLY^VA^20151-2228^|||||||Set up: Mon, Thurs 2 p.m. (Evening shift) (Release 10 p.m.); Report available: 3 days|Immunoassay|||||||

OM4|8.1||Plastic screw-cap vial|||||||1 mL citrated plasma (light blue-top) tube||R^null^99QDI||

MFE|MAD|||86001450^LAMBDA LIGHT CHAIN, TOTAL RANDOM URINE^99QDI^27394-6^Immunoglobulin light chains.lambd^LN|CWE||

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OM1|9|35208^LAMBDA LIGHT CHAIN, TOTALRANDOM URINE^99QDI||Y|11D0255931^At-
lanta^CLIA||||LAMBDA LIGHT CHAIN, TOTALRANDOM URINE|Y|||||A|||||||QUEST
DIAGNOSTICS NICHOLS INSTITUTE CHANTILLY^
CLIA|14225 NEWBROOK DRIVE^^CHANTILLY^VA^20151-
2228^|||||||NEPHELOMETRIC|||||||
OM4|9.1||PLASTIC LEAKPROOK CONTAINER|||||||2 ML RANDOM URINE - NO
PRESERVATIVE|||R^null^99QDI||
MFE|MAD|||85982190^MITOTANE (LYSODREN)^99QDI^13626-7^Mitotane^LN|CWE||
OM1|10|30347^MITOTANE (LYSODREN)^99QDI||Y|11D0255931^Atlanta^CLIA|||||MITOTANE
(LYSODREN)|Y|||||A|||||||^NMS LABS^CLIA|3701 WELSH ROAD^^WILLOW GROVE^PA^19090-
0437^|||||||GAS CHROMATOGRAPHY (GC)|||||||
OM2|10|mcg/mL^mcg/mL^99QDI|||||||
OM4|10.1||PLASTIC SCREW-CAP VIAL|||||||1 ML SERUM COLLECTED IN A RED-TOP TUBE (NO
GEL) INSTRUCTIONS: PROMPTLY CENTRIFUGE AND SEPARATE SERUM OR PLASMA INTO A PLASTIC
SCREW-CAPPED VIAL.|||R^null^99QDI||

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Sample 2—M10 Master file notification – Test/Observation batteries

The following M10 sample message shows 10 sets of OM1 and associated OM4 and OM5 segments.

```

MSH|^~\&|SKB|^11D0255931^CLIA|||20240112201832||MFN^M10^MFN_M10|M10SKB_
20240112201832|P^T|2.6|||AL|NE|||||ACLA_DOS_V1.0||||
MFI|OMC^Observation batteries master file^HL7 0175||REP|||NE
MFE|MAD|||5600002508^Elm (t8) IgE^99QDI|CWE||
OM1|1|2508^Elm (t8) IgE^99QDI||Y|^CLIA#11D0255931^Atlanta^CLIA|||||Elm (t8)
IgE|Y|||||P|||||
||||^QUEST DIAGNOSTICS-ATLANTA^CLIA|1777 MONTREAL CIRCLE^^TUCKER^GA^30084-
6802^|||||||Set up: Mon-Fri 8:00 a.m., 2:00 p.m.; Report available: 3 days|Im-
munoassay|||||||
OM5|1|55092705^ELM (T8) IGE^99QDI~55092710^CLASS^99QDI|
OM4|1|||||||0.3 mL serum|||R^null^99QDI|P|
MFE|MAD|||8705011269^Immune Complex Detection Panel 2^99QDI|CWE||
OM1|2|11269^Immune Complex Detection Panel 2^99QDI||Y|^CLIA#11D0255931^At-
lanta^CLIA|||||Immune Complex Detection Panel 2|Y|||||S|||||||^QUEST
DIAGNOSTICS/SJC^CLIA~^QUEST DIAGNOSTICS/SJC^CLIA~^QUEST DIAGNOSTICS/SJC^CLIA|33608
ORTEGA HWY^^SAN JUAN CAPISTRANO^CA^92675-2042^~33608 ORTEGA HWY^^SAN JUAN
CAPISTRANO^CA^92675-2042^~33608 ORTEGA HWY^^SAN JUAN CAPISTRANO^CA^92675-
2042^|||||||Received room temperature ; Received refrigerated ; Lipemia|Set up:
; Report available:|Immunoassay|||||||
OM5|2|8705011218^C3D CIRCULATING IMMUNE COMPLEXES^99QDI~8705036735^IMMUNE COMPLEX,
C1Q^99QDI~8705000618^COMPLEMENT, TOTAL (CH50)^99QDI|
OM4|2|||||||Draw sample without anticoagulant, allow to clot. Separate serum into
plastic screw-cap vial(s)and freeze within one hour of time drawn. With multiple
tests, submit a separate tube for each test. Do not submit samples in a glass tubes.
Do not thaw.|||3 x 1mL frozen serum collected in a no additive (red-top)
tube|||R^null^99QDI|P|
MFE|MAD|||8700070141^FEBRILE ANTIBODIES PANEL^99QDI|CWE||
OM1|3|70141^FEBRILE ANTIBODIES PANEL^99QDI||Y|^CLIA#11D0255931^At-
lanta^CLIA|||||FEBRILE ANTIBODIES PANEL|Y|||||S|||||||^FOCUS DIAGNOSTICS,
INC^CLIA~^FOCUS DIAGNOSTICS, INC^CLIA~^FOCUS DIAGNOSTICS, INC^CLIA|5785 CORPORATE
AVENUE^^CYPRESS^CA^90630-4753^~5785 CORPORATE AVENUE^^CYPRESS^CA^90630-4753^~5785
CORPORATE AVENUE^^CYPRESS^CA^90630-4753^|||||||

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OM5|8|85997950^HOMOVANILLIC ACID^99QDI~85997951^CREATININE, RANDOM URINE^99QDI|
OM4|8|10 mL well-mixed random urine with pH adjusted to <3.0 using 6N HCl.
Urine without preservative is acceptable if pH is<6 and the sample is shipped
frozen. ||R^null^99QDI|P|
MFE|MAD|||8700019553^LYMPHOGRANULOMA VENEREUM(LGV) DIFF AB PNL MIF^99QDI|CWE||
OM1|9|19553^LYMPHOGRANULOMA VENEREUM(LGV) DIFF AB PNL
MIF^99QDI||Y|^CLIA#11D0255931^Atlanta^CLIA|||||LYMPHOGRANULOMA VENEREUM(LGV) DIFF
AB PNL MIF|Y|||||P|||||^FOCUS DIAGNOSTICS, INC^CLIA|5785 CORPORATE
AVENUE^^CYPRESS^CA^90630-4753^|||||MICRO-INDRECT FLUORESCENCE (MIF) ASR 1
THIS TEST WAS DEVELOPED AND ITS PERFORMANCE CHARACTERISTICS HAVE BEEN DETERMINED BY
FOCUS DIAGNOSTICS. IT HAS NOT BEEN CLEARED OR APPROVED BY THE U.S. FOOD AND DRUG
ADMINISTRATION. THE FDA HAS DETERMINED THAT SUCH CLEARANCE OR APPROVAL IS NOT
NECESSARY. PERFORMANCE CHARACTERISTICS REFER TO THE ANALYTICAL PERFORMANCE OF THE
TEST. |||||||
OM5|9|86002241^C.TRACHOMATIS (L2) IGG^99QDI~86002242^C.TRACHOMATIS (L2)
IGA^99QDI~86002243^C.TRACHOMATIS (L2)
IGM^99QDI~86002244^INTERPRETATION^99QDI~86002245^C.TRACHOMATIS (D K)
IGG^99QDI~86002246^C.TRACHOMATIS (D K) IGA^99QDI~86002247^C.TRACHOMATIS (D K)
IGM^99QDI~86002248^INTERPRETATION^99QDI~86002249^C.PNEUMONIAE
IGG^99QDI~86002250^C.PNEUMONIAE IGA^99QDI~86002251^C.PNEUMONIAE
IGM^99QDI~86002252^INTERPRETATION^99QDI~86002253^C.PSITTACI
IGG^99QDI~86002254^C.PSITTACI IGA^99QDI~86002255^C.PSITTACI
IGM^99QDI~86002256^INTERPRETATION^99QDI|
OM4|9|1 ML SERUM ||R^null^99QDI|P|
MFE|MAD|||8430470204^Opiates, Clinical Screen with Confirmation^99QDI|CWE||
OM1|10|30470^Opiates, Clinical Screen with Con-
firmation^99QDI||Y|^CLIA#11D0255931^Atlanta^CLIA|||||Opiates, Clinical Screen with
Confirmation|Y|||||P|||||^QUEST DIAGNOSTICS EMPLOYER SOLUTIONS^CLIA|1777
MONTREAL CIRCLE^FLOOR 2^TUCKER^GA^30084-6802^|||||Urine with pre-
servative||EMIT(R) with confirmation|||||Codeine~Morphine
OM5|10|84002000^PH^99QDI~84002200^CREATININE^99QDI~84021200^OPIATES^99QDI~84021300^~
MORPHINE^99QDI~84021400^CODEINE^99QDI~84021500^HYDROMORPHONE^99QDI~84021600^HYDROCO-
DONE^99QDI~84023300^PLEASE NOTE:^99QDI~84999990^PLEASE NOTE:^99QDI|
OM4|10|10 mL random urine ||R^null^99QDI|P|

Sample 3—M04 Master File notification – Charge description

The following M04 sample message provides an abbreviated list of MFE and associated CDM segments.

MSH|^~\&|SKB|^11D0255931^CLIA|||20240112201832||MFN^M04^MFN_M04|M04SKB_
20240112201832|P^T|2.6||AL|NE||||ACLA_DOS_V1.0|||
MFI|OMC^Observation batteries master file^HL7 0175||REP||NE
MFE|MAD|||5600002508^Elm (t8) IgE^99QDI|CWE||
CDM|5600002508^Elm (t8) IgE^99QDI||||86003^^99QDI
MFE|MAD|||2600004637^GLUCOSE, POSTPRANDIAL/2 HOUR^99QDI|CWE||
CDM|2600004637^GLUCOSE, POSTPRANDIAL/2 HOUR^99QDI||||82947^^99QDI
MFE|MAD|||8700035381^CHLORINATED HYDROCARBONS, BLOOD (CSA)^99QDI|CWE||
CDM|8700035381^CHLORINATED HYDROCARBONS, BLOOD (CSA)^99QDI||||84600^^99QDI
MFE|MAD|||8700059245^N TELOPEPTIDE, SERUM^99QDI|CWE||
CDM|8700059245^N TELOPEPTIDE, SERUM^99QDI||||82523^^99QDI
MFE|MAD|||8700008512^GASTRIN RELEASING PEPTIDE^99QDI|CWE||
CDM|8700008512^GASTRIN RELEASING PEPTIDE^99QDI||||83519^^99QDI

MFE|MAD|||8700006100^DANTROLENE^99QDI|CWE||
CDM|8700006100^DANTROLENE^99QDI||||80299^^99QDI
MFE|MAD|||8705010027^IGM, IHC^99QDI|CWE||
CDM|8705010027^IGM, IHC^99QDI||||88342^^99QDI
MFE|MAD|||8707500500^Glucose-6-Phosphate Dehydrogenase, Quantitative^99QDI|CWE||
CDM|8707500500^Glucose-6-Phosphate Dehydrogenase, Quant-
itative^99QDI||||82955^^99QDI
MFE|MAD|||8700005033^THIOCYANATE (U)^99QDI|CWE||
CDM|8700005033^THIOCYANATE (U)^99QDI||||82570^^99QDI~84430^^99QDI
MFE|MAD|||8707506346^Homovanillic Acid (HVA), Random Urine^99QDI|CWE||
CDM|8707506346^Homovanillic Acid (HVA), Random
Urine^99QDI||||82570^^99QDI~83150^^99QDI
MFE|MAD|||8707500623^Magnesium, RBC^99QDI|CWE||
CDM|8707500623^Magnesium, RBC^99QDI||||83735^^99QDI
MFE|MAD|||8700019553^LYMPHOGRANULOMA VENEREUM(LGV) DIFF AB PNL MIF^99QDI|CWE||
CDM|8700019553^LYMPHOGRANULOMA VENEREUM(LGV) DIFF AB PNL
MIF^99QDI||||86631^^99QDI~86631^^99QDI~86631^^99QDI~86631^^99QDI~86631^^99QDI~8663-
1^^99QDI~86631^^99QDI~86631^^99QDI~86632^^99QDI~86632^^99QDI~86632^^99-
QDI
MFE|MAD|||8430470204^Opiates, Clinical Screen with Confirmation^99QDI|CWE||
CDM|8430470204^Opiates, Clinical Screen with Confirmation^99QDI||||80101^^99QDI
MFE|MAD|||2600019112^RENAL FUNCTION PANELW/O eGFR^99QDI|CWE||
CDM|2600019112^RENAL FUNCTION PANELW/O eGFR^99QDI||||80069^^99QDI
MFE|MAD|||5600007981^Allergy Panel by PCS, Region 1, Weeds^99QDI|CWE||
CDM|5600007981^Allergy Panel by PCS, Region 1, Weed-
s^99QDI||||86003^^99QDI~86003^^99QDI~86003^^99QDI~86003^^99QDI~86003^^99QDI
MFE|MAD|||7500000389^Culture, Blood^99QDI|CWE||
CDM|7500000389^Culture, Blood^99QDI||||87040^^99QDI
MFE|MAD|||8700016251^INFLUENZA A VIRUS H1/H3SUBTYPING REAL TIME PCR^99QDI|CWE||
CDM|8700016251^INFLUENZA A VIRUS H1/H3SUBTYPING REAL TIME PCR^99QDI||||87502^^99QDI
MFE|MAD|||8436357204^DRUG ABUSE PANEL 8-50NO CONFIRM^99QDI|CWE||
CDM|8436357204^DRUG ABUSE PANEL 8-50NO
CONFIRM^99QDI||||80101^^99QDI~80101^^99QDI~80101^^99QDI~80101^^99QDI~80101^^99QDI~
80101^^99QDI~80101^^99QDI~80101^^99QDI
MFE|MAD|||8705011319^Phosphorus, Inorganic, 24-HourUrine withoutCreat-
inine^99QDI|CWE||
CDM|8705011319^Phosphorus, Inorganic, 24-HourUrine withoutCreat-
inine^99QDI||||84105^^99QDI
MFE|MAD|||8705019214^HER 2, IHC, W/O INTERP^99QDI|CWE||
CDM|8705019214^HER 2, IHC, W/O INTERP^99QDI||||88360^^99QDI
MFE|MAD|||8100011219^Drug Screen, Clinical 1, without Confirmation, Urine^99QDI|CWE||
CDM|8100011219^Drug Screen, Clinical 1, without Confirmation,
Urine^99QDI||||80101^^99QDI~80101^^99QDI~80101^^99QDI~80101^^99QDI~80101^^99QDI~80-
101^^99QDI~80101^^99QDI~80101^^99QDI~80101^^99QDI~80101^^99QDI

Incremental update files

The following sample files are from the Atlanta (SKB) lab. Each incremental update file is specific to an order code.

Sample 1—M08 Master file notification – Test/Observation

```
MSH|^~\&|SKB|^555555^CLIA|||20241121214535-0800||MFN^M08^MFN_M08|M08SKB_
20241121214535|P^T
|2.6|||AL|NE|||ACLA_DOS_V1.0|||
MFI|OMC^Observation batteries master file^HL7 0175||UPD|||NE
MFE|MUP|||5600002735^Yellow Hornet (i5) IgE^99QDI|CWE||
OM1|1|2735^Yellow Hornet (i5) IgE^99QDI||Y|^CLIA#555555^test^CLIA|||Yellow Hornet
(i5) IgE|Y|||N|||^QUEST DIAGNOSTICS-ATLANTA^CLIA|1777 MONTREAL
CIRCLE^^TUCKER^GA^30084-6802^|||Set up: Mon-Fri 8 a.m, 2 p.m.; Report
available: 3 days|Immunoassay||| OM5|1|55089905^YELLOW HORNET (I5)
IGE^99QDI~55089910^CLASS^99QDI|
OM4|1|||0.3 mL serum||R|P|
```

Sample 2—M10 Master file notification – Test/Observation batteries

```
MSH|^~\&|SKB|^555555^CLIA|||20241121214535-0800||MFN^M10^MFN_M10|M10SKB_
20241121214535|P^T
|2.6|||AL|NE|||ACLA_DOS_V1.0|||
MFI|OMC^Observation batteries master file^HL7 0175||UPD|||NE
MFE|MUP|||5600002735^Yellow Hornet (i5) IgE^99QDI|CWE||
OM1|1|2735^Yellow Hornet (i5) IgE^99QDI||Y|^CLIA#555555^test^CLIA|||Yellow Hornet
(i5) IgE|Y|||N|||^QUEST DIAGNOSTICS-ATLANTA^CLIA|1777 MONTREAL
CIRCLE^^TUCKER^GA^30084-6802^|||Set up: Mon-Fri 8 a.m, 2 p.m.; Report
available: 3 days|Immunoassay||| OM5|1|55089905^YELLOW HORNET (I5)
IGE^99QDI~55089910^CLASS^99QDI|
OM4|1|||0.3 mL serum||R|P|
```

Sample 3—M04 Master file notification – Charge description

```
MSH|^~\&|SKB|^555555^CLIA|||20241121214535-0800||MFN^M04^MFN_M04|M04SKB_
20241121214535|P^T
|2.6|||AL|NE|||ACLA_DOS_V1.0|||
MFI|OMC^Observation batteries master file^HL7 0175||UPD|||NE
MFE|MUP|||5600002735^Yellow Hornet (i5) IgE^99QDI|CWE||
OM1|1|2735^Yellow Hornet (i5) IgE^99QDI||Y|^CLIA#555555^test^CLIA|||Yellow Hornet
(i5) IgE|Y|||N|||^QUEST DIAGNOSTICS-ATLANTA^CLIA|1777 MONTREAL
CIRCLE^^TUCKER^GA^30084-6802^|||Set up: Mon-Fri 8 a.m, 2 p.m.; Report
available: 3 days|Immunoassay||| OM5|1|55089905^YELLOW HORNET (I5)
IGE^99QDI~55089910^CLASS^99QDI|
OM4|1|||0.3 mL serum||R|P|
```

Retrieving eDOS Files via WebDAV

To ensure that the most current eDOS files are available, the eDOS files are available via WebDAV. WebDAV enables the automated update and delivery of the data that is critical to driving your EMR/EHR lab order applications. Always replace your existing eDOS files with the new eDOS files you download. This helps to ensure that your EMR/EHR applications are always using the most recent and accurate order entry information available so that valid orders are being sent to Quest Diagnostics for processing. (For more information about WebDAV, refer to the WebDAV Resources website: <http://www.webdav.org/>.)

Note: As an alternative to WebDAV, you can also retrieve the eDOS files via the Retrieve Test Compendium web service. For more information, see [Chapter 9, “Retrieve Test Compendium web service API reference” beginning on page 280](#).

Retrieve eDOS files

1 In a browser, navigate to one of the following URLs:

- During the development process (prior to certification), access the eDOS files from the Certification environment, as shown below:

`https://certhubservices.quantum.com/webdav/cdc`

- After certification is complete, access the eDOS files from the Production environment, as shown below:

`https://hubservices.quantum.com/webdav/cdc`

2 When prompted, type your username and password (provided by Quest), and sign in.

The image shows a dark-themed sign-in dialog box. At the top, it says "Sign in to access this site" in white. Below that, it says "Authorization required by https://certhubservices.quantum.com" in a smaller white font. There are two input fields: "Username" and "Password", both with white text and empty text boxes. At the bottom right, there are two buttons: a blue "Sign in" button and a grey "Cancel" button.

Note: A separate username and password are provided for the Certification and Production environments.

The web folder for your corresponding Quest lab appears in the web browser. Within the Quest BU folder are the following items:

- **eDOS folder.** This folder contains the eDOS full replacement and incremental updates folders, as follows:
 - **eDOS_Full_Replacement folder.** This folder contains an HL7 file for each eDOS message file type (M04, M08, and M10). There is always only one complete set of eDOS files in this folder. When a new set of full replacement eDOS files are ready, the existing files are overwritten
 - **eDOS_Incremental_Updates folder.** This folder contains one or more M04, M08, and M10 HL7 files that contain incremental changes to the eDOS compendium. Incremental files are retained for 90 days, so this folder will contain multiple files that can be differentiated by the unique numeric ID in the file name
- **Clinical Data Compendium (CDC) dataset text files.** These are the dataset files for the older format of reference data needed to create complete and valid orders, as explained in [Chapter 10, “Clinical Data Compendium” beginning on page 299](#)

The following example illustrates the contents of the top-level folder for the Quest Tampa lab, with a lab code of TMP.

Directory listing for /webdav/cdc/TMP

[Up To /webdav/cdc](#)

Filename	Size	Last Modified
eDOS/		Fri, 10 Nov 2023 18:58:05 GMT
AOE_STL.TXT	668.2 kb	Sat, 07 Oct 2023 22:41:51 GMT
BILL_TO_STL.TXT	39.8 kb	Sat, 07 Oct 2023 22:41:51 GMT
CONTAINER_STL.TXT	438.1 kb	Sat, 07 Oct 2023 22:41:51 GMT
CPTCODES_STL.TXT	126.9 kb	Sat, 07 Oct 2023 22:41:51 GMT
CPTICD10_STL.TXT	24107.2 kb	Sat, 07 Oct 2023 22:41:51 GMT
HEMOLYSIS_STL.TXT	148.7 kb	Sat, 07 Oct 2023 22:41:51 GMT
LIPENIA_STL.TXT	95.1 kb	Sat, 07 Oct 2023 22:41:51 GMT
METHODOLOGY_STL.TXT	1354.7 kb	Sat, 07 Oct 2023 22:41:51 GMT
ORDCODE_STL.TXT	735.6 kb	Sat, 07 Oct 2023 22:41:51 GMT

- 3 To view the sub-folders for the full replacement and incremental update files, click the eDOS web folder.

Directory listing for /webdav/cdc/TMP/eDOS

[Up To /webdav/cdc/TMP](#)

Filename	Size	Last Modified
eDOS_Full_Replacement/		Fri, 10 Nov 2023 19:02:36 GMT
eDOS_Incremental_Updates/		Fri, 10 Nov 2023 19:02:36 GMT

4 Do one of the following:

- To view the full set of HL7 replacement files (M04, M08, and M10), click the *eDOS_Full_Replacement* web folder:

Directory listing for /webdav/cdc/TMP/eDOS/eDOS_Full_Replacement

[Up To /webdav/cdc/TMP/eDOS](#)

Filename	Size	Last Modified
TMP_M04_20230802174650_262_REP.hl7	2.7 kb	Wed, 02 Aug 2023 17:46:54 GMT
TMP_M08_20230802174643_262_REP.hl7	2.7 kb	Wed, 02 Aug 2023 17:46:54 GMT
TMP_M10_20230802174647_262_REP.hl7	2.7 kb	Wed, 02 Aug 2023 17:46:54 GMT

- To view the available HL7 update files (M04, M08, and/or M10), click the *eDOS_Incremental_Updates* web folder.

5 From the web browser window, click the file to download it to your PC.

Part III: Results retrieval

This section provides detailed information necessary for creating a client application to interact with the Quantum Hub to retrieve lab test results.

This section includes the following chapter(s):

- [Chapter 12, “JAX-RS \(RESTful\) Results Retrieval web service”](#) beginning on page 374
- [Chapter 13, “JAX-WS \(SOAP\) Results Retrieval web service”](#) beginning on page 399
- [Chapter 14, “Push method for receiving lab results”](#) beginning on page 430
- [Chapter 15, “Lab results HL7 2.3/2.3.1 specification”](#) beginning on page 441
- [Chapter 16, “Lab results HL7 LRI 2.5.1 specification”](#) beginning on page 485

Chapter 12: JAX-RS (RESTful) Results Retrieval web service

In this chapter:

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About the JAX-RS (RESTful) Results Retrieval web service

This chapter provides details about the JAX-RS results retrieval API. JAX-RS uses the Representational State Transfer (REST) web service, which complies with the Java API for RESTful web services (JAX-RS 2.0) specification (*JSR-311*). It facilitates the retrieval of the following types of lab results from Quest Diagnostics, as well as for the acknowledgment of those results:

- **HL7 results.** Your application can retrieve and acknowledge an individual results message, or a group of results messages in HL7 format (including HL7 messages with embedded PDFs)
- **Printable (PDF) results.** Your application can retrieve and acknowledge a Printable lab results document (in PDF)
- **Observation results.** Your application can retrieve and acknowledge results as a bundle of HL7 messages and PDF documents. The configuration option *Send Document Types* determines the type of PDF documents (clinical, enhanced, or both) that are delivered in the HL7 bundle

In conjunction with the JAX-RS (RESTful) Results Retrieval web service, the following settings also affect results retrieval, and are pre-configured for the associated Hub account:

- **HL7 Version.** This setting specifies the results HL7 version that your application is able to receive and process
- **Results Filter.** This setting specifies whether or not obsolete and/or duplicate results are filtered out (**not** sent to your application)
- **Finals Only.** This setting specifies whether your application will receive partial and final results, or final results only

To access this web service using OAuth 2.0 authentication, a valid OAuth2 token is required.

For more information

- For details about the JAX-RS web service, see [“JAX-RS \(RESTful\) Results Retrieval web service methods” on page 377](#)
- For information about the acknowledgment of retrieved results, see [“Acknowledging the receipt of results” on page 389](#)
- For information about accessing the endpoints, see [“JAX-RS \(RESTful\) Results Retrieval web service endpoints” on page 398](#)
- For HL7 lab result message specifications, see [Chapter 15, “Lab results HL7 2.3/2.3.1 specification” beginning on page 441](#) or [Chapter 16, “Lab results HL7 LRI 2.5.1 specification” beginning on page 485](#)

Best practices for using the JAX-RS web service

This section describes the best practices that you should follow when creating your client application to interact with the RESTful-based JAX-RS web service. Following these best practices will help minimize any technical or performance issues that might otherwise result from invalid or inappropriate use of the web service.

JAX-RS web service best practices

The following best practices are specific to the JAX-RS web service:

- **Specify the maximum number of results to return.** When requesting results, specify (using the `maxMessages` attribute of the `requestParameters` object) the maximum number of results to be returned; otherwise, the maximum default defined for the Quantum Hub is used. The default maximum values are: `HL7 = 100`, `Observation = 50`, and `PDF = 1`

Note: The default `maxMessages` values are the highest possible values. If you enter a higher value, the default value is used.

- **Acknowledge all retrieved results.** After retrieving results using the `getResults` method, you must acknowledge each retrieved result using the `acknowledgeResults` method. This applies to HL7, Printable (PDF), and Observation results.

Acknowledging results removes the result from the Quantum Hub retrieval queue, preventing the same result from being retrieved multiple times with successive `getResults` requests

- **Do not submit duplicate acknowledgments.** Do not submit more than 1 acknowledgment for the same result. If the Quantum Hub receives duplicate acknowledgments within the same second, it rejects them with a system exception
- **Do not ignore ACK response errors.** For each acknowledgment request submitted to the Quantum Hub, the Quantum Hub returns an acknowledgment response, indicating that the acknowledgment was successfully received, and also whether any errors were contained in the ACK message (for HL7 or Observation results).

If the acknowledgment response reports an error condition, you must resolve the error so that the results can be properly acknowledged

Notes:

- An acknowledgment request must specify the same results type (HL7, Printable, or Observation) as the retrieved results
- When acknowledging HL7 or Observation results, the HL7 ACK message must use the same HL7 version as the retrieved results message
- For more information about acknowledging results, see [“Acknowledging the receipt of results” on page 389](#)

JAX-RS (RESTful) Results Retrieval web service methods

This section provides details on the methods and parameters provided by the JAX-RS (RESTful) Results Retrieval web service API. Result methods include the following:

- “[getResults](#)” below
- “[acknowledgeResults](#)” on page 381

getResults

The `getResults` method allows you to retrieve messages of the HL7, Printable, and/or Observation result types from the Quantum Hub.

Endpoint

You must use the HTTP POST method to retrieve results from the endpoint shown below, where *domain* specifies the Quantum Hub environment. For the complete uniform resource identifier (URIs) for each of the Quantum Hub environments, see “[JAX-RS \(RESTful\) Results Retrieval web service endpoints](#)” on page 398.

```
POST https://domain/hub-resource-server/oauth2/result/getResults
```

Message request specifications

The message request is a request for new results (those that have not yet been acknowledged) of the specified type that have been received for the Hub account associated with the authenticated user.

The request is formatted as `application/json`.

The following is an example of the message body:

```
{
  "resultServiceType": "string",
  "requestParameters":
    [
      {
        "parameterName":
          "maxMessages",
        "parameterValue":
          "string"
      }
    ]
}
```

Request parameter descriptions

Parameter	Data type	Req'd ^a	Description/attributes
resultServicetype	String	R	<p>The type of results being retrieved. Possible values include the following:</p> <ul style="list-style-type: none"> • HL7: HL7 results • Printable: Printable (PDF) results • Observation: a bundle of HL7 messages and PDF documents
requestParameters	requestParameters[]	0	<p>Use this array to specify the maximum number of results to return. By default the following maximum number of results are returned:</p> <ul style="list-style-type: none"> • HL7: 1000 • Observation: 50 • PDF: 1 <p>Attributes that can be set for this object include the following:</p>
	String	0	<ul style="list-style-type: none"> • parameterName. This is <code>maxMessages</code>
	String	0	<ul style="list-style-type: none"> • parameterValue. The maximum number of results to return <p>Note: If you specify a <code>maxMessages</code> value higher than the Quantum Hub default value, then the default value is used.</p>

Message response specifications

The message response is 1 of the following, based on the results type specified:

- **HL7 results.** These are HL7 messages in a `results` object, which contains the HL7 messages as an array of `hL7Message` objects. Each `hL7Message` object contains a Base64-encoded HL7 message. The `results` object also contains an array of error messages (if any) and a request ID, and indicates whether or not more results exist for the query. If PDFs are included as part of the result:
 - The PDFs are embedded in the HL7 message if the Hub account is configured to do so; otherwise no PDFs are returned with the HL7
 - If the Hub account is configured for PDFs to be returned, the Hub account configuration also determines which type of PDF (clinical, enhanced, or both) is embedded in the HL7 message
- **Printable results.** This is a PDF file encoded as an array of bytes, and additional information about the data (`resultInfo`). The `results` object also contains an array of error messages (if any) and a request ID, and indicates whether or not more results exist for the query

The response is formatted as `application/json`.

^aR = Required, 0 = Optional.

The following is an example of the message body:

```
{
  "isMore": string,
  "requestId": "string",
  "results":
  [
    {
      "documents":
      [
        {
          "documentId": "string",
          "fileName": "string",
          "fileMimeType": "string",
          "documentData": "string",
          "resultInfo":
          {
            "providerAcctId": "string",
            "messageControlId":
              "string",
            "arrivalDate": string
          }
        }
      ],
      "resultId": string,
      "resultType": string,
      "hl7Message": string
      "message": "string",
      "controlId": "string"
    }
  ],
  "errorMessages": string,
  "providerAccounts": string
}
```

Response parameter descriptions

Parameter	Data type	Req'd ^a	Description/attributes
isMore	Boolean	0	This indicates whether or not more results are available from the Quantum Hub to be returned. Possible values include the following: <ul style="list-style-type: none">• True: there are more results• False: there are no more results
results	String[]	0	The array of results (if any) returned as a result of the request.

^aR = Required, 0 = Optional.

Parameter	Data type	Req'd ^a	Description/attributes
			This contains either 1 or more result documents or an HL7 result message. It also includes a <code>requestId</code> and an attribute that indicates the result type (for a PDF or Observation result).
documents	String[]	0	The array of document objects. Responses include the following:
	String	0	• documentId . The document ID
	String	0	• fileName . The name of the file
	String	0	• fileMimeType . The file's MIME type
	String	0	• documentData . The Base64-encoded document
	String[]	0	• resultInfo . Information about this result, which includes the following:
	String	0	• providerAcctId . The provider account ID
	String	0	• messageControlId . The message control ID
	Date string	0	• arrivalDate . The arrival date of the results
resultId	String	0	This is the result ID associated with this request.
resultType	String	0	The type of result message for an Observation result. This value will always be set to <code>LAB</code> .
hL7Message	String[]	0	The HL7 result message content, which includes the following:
	String	0	• message . The Base64-encoded HL7 message
	String	0	• controlId . The message control ID of the HL7 message
errorMessages	String[]	0	The array of error messages (if any) associated with this request.
providerAccounts	String	0	The provider account ID.

^aR = Required, 0 = Optional.

HTTP response codes

The following table lists the possible HTTP response codes for the `getResults` method.

Note: Specific information is included with the HTTP response code.

Response code	Definition
200	The request was completed successfully.
400	The request was not properly constructed.
401	The user credentials submitted are not authorized.
403	The username submitted does not have permission to access the JAX-RS (RESTful) Results Retrieval web service.
404	The requested endpoint was not found.
500	An internal server error occurred.

acknowledgeResults

The `acknowledgeResults` method allows you to acknowledge the results that are retrieved using `getResults`.

Endpoint

You must use the HTTP POST method to acknowledge results from the endpoint shown below, where *domain* specifies the Quantum Hub environment. For the complete uniform resource identifier (URIs) for each of the Quantum Hub environments, see “JAX-RS (RESTful) Results Retrieval web service endpoints” on page 398.

```
POST https://domain/hub-resource-server/oauth2/result/acknowledgeResults
```

Message request specifications

This is the acknowledgment for the results that are received using `getResults`. Each result that is received must be acknowledged. The requirements for acknowledging each of the results types (HL7, Printable, or Observation) are as follows:

Result type	Description
HL7 results	The following attributes must be specified for the <code>acknowledgeResults</code> object when acknowledging HL7 results: <ul style="list-style-type: none">• resultServiceType. This must be HL7• requestId. This is the request ID (received in the <code>results</code> object) identifying the results that are being acknowledged• ackMessages. This is the HL7 ACK message content
Printable results	The following attributes must be specified for the <code>acknowledgeResults</code> object when acknowledging Printable (PDF) results:

Result type	Description
	<ul style="list-style-type: none"> • resultServiceType. This must be <code>Printable</code> • requestId. This is the request ID (received in the <code>results</code> object) identifying the results that are being acknowledged • requestParameters. This contains the following parameters: <ul style="list-style-type: none"> • messageControlId. The message control ID • providerAcctId. The provider account ID
Observation results	<p>The following attributes must be specified for the <code>acknowledgeResults</code> object when acknowledging Observation results:</p> <ul style="list-style-type: none"> • resultServiceType. This must be <code>Observation</code> • requestId. The request ID (received in the <code>results</code> object) identifying the results that are being acknowledged • ackMessages. The HL7 ACK message content

Note: For additional information on acknowledging results, see [“Acknowledging the receipt of results” on page 389](#). For a sample acknowledgment request and response, see [“Sample acknowledgment requests and responses” on page 394](#).

The request is formatted as `application/json`.

The following is an example of the message body:

```
{
  "resultServiceType": "string"
  "requestId": "string"
  "ackMessages":
  [
    {
      "message":
      [
        byte
      ]
      "controlId": "string"
    }
  ]
  "resultServiceType": "string"
  "requestParameters":
  [
    {
      "parameterName": "string"
      "parameterValue": "string"
    }
  ]
}
```

Request parameter descriptions

Parameter	Data type	Req'd ^a	Description/attributes
resultServiceType	String	R	This must be 1 of the following: <ul style="list-style-type: none"> HL7 Printable Observation
requestId	String	R	This contains the request ID (received in the results object) identifying the results that are being acknowledged.
ackMessages	String[]	C	This contains 1 or more HL7 ACK messages (1 for each HL7 result received) and corresponding <code>controlId</code> (optional; for informational purposes only). The ACK message must be formatted as outlined in “HL7 ACK message segment specifications” on page 390. This is required for HL7 and Observation results.
	Byte[]	C	<ul style="list-style-type: none"> message. The ACK message formatted as outlined in “HL7 ACK message segment specifications” on page 390. This is required for HL7 and Observation results
	String	C	<ul style="list-style-type: none"> controlID. The <code>messageControlId</code> (received in the results object) identifying the result document. This is required for HL7 and Observation results
requestParameters	String[]	C	This is an array of parameter name/value pairs, used to specify 1 or more parameter values, each as a separate String property:

^aR = Required, O = Optional, C = Conditional.

Parameter	Data type	Req'd ^a	Description/attributes
	String	C	<ul style="list-style-type: none"> • parameterName. Parameters that can be set for this object include the following: <ul style="list-style-type: none"> • messageControlId. The <code>messageControlId</code> (received in the <code>resultInfo</code> object) that identifies a result document. This is required for PDF results • providerAcctId. The provider account ID (received in the <code>JAX-RS (RESTful) Results Retrieval web service methods</code> object) that identifies a result document. This is required for PDF results • rejectionReason. This is a description used to explain a negative acknowledgment, if returned
	String	C	<ul style="list-style-type: none"> • parameterValue. This is the value associated with a corresponding parameter

Message response specifications

These are the error messages (if any) in the `results` object; if there are no errors, then the object is empty.

The response is formatted as `application/json`.

The following is an example of the message body:

```
{
  "isMore": string
  "requestId": string
  "results": string
  "errorMessages": string
  "providerAccounts": string
}
```

Response parameter descriptions

Parameter	Data type	Req'd ^b	Description/attributes
<code>isMore</code>	Boolean	O	This will always be <code>false</code> .
<code>requestId</code>	String	R	The request ID of the message being acknowledged.
<code>results</code>	String	O	This will always be blank.
<code>errorMessages</code>	String	O	The error message (if any) associated with this request.
<code>providerAccounts</code>	String	O	This will always be blank.

^aR = Required, O = Optional, C = Conditional.

^bR = Required, O = Optional, C = Conditional.

HTTP response codes

The following table lists the possible HTTP response codes for the `acknowledgeResults` method.

Note: Specific information is included with the HTTP response code.

Response code	Description
200	The request was completed successfully.
400	The request was not properly constructed.
401	The user credentials submitted are not authorized.
403	The username submitted does not have permission to access the JAX-RS (RESTful) Results Retrieval web service.
404	The requested endpoint was not found.
500	An internal server error occurred.

Sample JAX-RS results requests and responses

This section provides sample request and response messages for the JAX-RS Results Retrieval web service. For details on the `getResults` method, see “`getResults`” on page 377.

getResults request and response for HL7 results

The following are sample `getResults` request and response messages for HL7 results:

getResults request for HL7 results

```
{
  "resultServiceType":"hl7",
}
```

getResults response for HL7 results

```
{
  "isMore": false,
  "requestId": "c64797f7ac1262861d005d859f4fd449",
  "results":[
    {
      "documents": null,
      "resultId": null,
      "resultType": null,
      "hl7Message":
        {
          "message": "TVNIffF5+XCZ8TEFCfEpB....", Base64-encoded content truncated
          "controlId": "800000000000000081707"
        }
    },
    {
      "documents": null,
      "resultId": null,
      "resultType": null,
      "hl7Message":
        {
          "message": "TVNIffF5+XCZ8TEFCfEp....", Base64-encoded content truncated
          "controlId": "800000000000000081769"
        }
    }
  ],
  "errorMessages": null,
  "providerAccounts": null
}
```

getResults request and response for PDF results

The following are sample `getResults` request and response messages for PDF results:

getResults request for PDF results

```
{
  "resultServiceType":"printable",
}
```

getResults response for PDF results

```
{
  "isMore": true,
  "requestId": "c205e097ac12641801d1241808274304",
  "results":
  [
    {
      "documents":
      [
        {
          "documentId": "813147",
          "fileName": "report.pdf",
          "fileMimeType": "application/pdf",
          "documentData": "JVBERi0xLj.....", Base64-encoded content truncated
          "resultInfo":
          {
            "providerAcctId": "9835",
            "messageControlId": "80000000000000079784-813147",
            "arrivalDate": 1422477959000
          }
        }
      ],
      "resultId": null,
      "resultType": null,
      "hl7Message": null
    }
  ],
  "errorMessages": null,
  "providerAccounts": null
}
```

getResults request and response for observation results

The following are sample `getResults` request and response messages for Observation results:

getResults request for observation results

```
{
  "resultServiceType":"observation",
}
```

getResults response for observation results

```
{
  "isMore": false,
  "requestId": "c5e59b1dac1262861d56fc21c081df17",
  "results":
  [
    {
      "documents":
      [
        {
          "documentId": "822116",
          "fileName": null,
          "fileMimeType": "application/pdf",
          "documentData": "JVBERi0xLjMnJeLjz....", Base64-encoded content truncated
          "resultInfo": null
        },
        {
          "documentId": "822117",
          "fileName": null,
          "fileMimeType": "application/pdf",
          "documentData": "JVBERi0xLjMnJeLjz....", Base64-encoded content truncated
          "resultInfo": null
        }
      ],
      "resultId": "c5e59c16ac1262861d86f703269808fe",
      "resultType": "LAB",
      "hl7Message":
      {
        "message": "TVNIffF5+XCZ8TEFCfEpB....", Base64-encoded content truncated
        "controlId": "8000000000000000081708"
      }
    }
  ],
  "errorMessages": null,
  "providerAccounts": null
}
```

Acknowledging the receipt of results

When lab results are retrieved from the Quantum Hub using the [getResults](#) method, the retrieving client application must acknowledge the results so that they will not be re-sent when the client application makes a subsequent [getResults](#) call. You must acknowledge the receipt of results using the [acknowledgeResults](#) method.

When an acknowledgment request is received by the Quantum Hub, the Quantum Hub replies with an acknowledgment response, indicating whether or not the acknowledgment was successfully received and processed.

This section does not cover **all** of the requirements for constructing an ACK message—only those requirements that are specific to the Quantum Hub.

Note: In the context of this chapter, a negative acknowledgment (NAK) message is an ACK message that contains an error condition; for example, an application error (AE).

Constructing the HL7 ACK message

An HL7 ACK message that is returned to the Quantum Hub in an HL7 or Observation acknowledgment request must contain the following HL7 segments:

- **MSH:** Message header
- **MSA:** Message acknowledgment

Notes:

- This section does **not** apply to acknowledgment requests for Printable (PDF) results, which do not contain an HL7 ACK message
- For details on the MSH and MSA segments, see [“HL7 ACK message segment specifications” on the next page](#)

Each of these segments must be constructed as outlined below:

- **MSH segment.** The MSH segment defines the intent, source, destination, and syntax of an HL7 message. The MSH segment that is returned to the Quantum Hub must be constructed as follows:
 - The content of MSH.04 (*Sending Facility*) and MSH.06 (*Receiving Facility*) must be reversed from what was received in the results message
 - The content of MSH.03 (*Sending Application*) and MSH.05 (*Receiving Application*) should also be reversed from what was received in the original results message, but this is not required
 - MSH.12 is a mandatory field and must contain the message Version ID (2.3, 2.3.1, or 2.5.1)For additional details on the content of the MSH segment, see [“MSH—Message header segment” on page 391](#).
- **MSA segment.** The MSA segment contains information pertinent to the acknowledgment of another HL7 message. The MSA segment that is returned to the Quantum Hub must be constructed as follows:
 - MSA.01 must contain an acknowledgment code to indicate the status of the most recently received message. Valid acknowledgment codes are shown in [“Acknowledgment codes” on the next page](#)
 - MSA.02 must contain a message control ID, which identifies the message that is being acknowledged
 - For NAKs, it is strongly recommended that MSA.03 contain a text message that describes the rejection reason

For additional details on the content of the MSA segment, see [“MSA—Message acknowledgment segment” on page 393](#).

Newline characters

HL7 ACK messages must use only the carriage return (CR) character (ASCII 0x0D) to indicate a segment delimiter. ACK messages that contain a line feed (LF) character (ASCII 0x0A) or carriage return and line feed characters (CRLF) to indicate a segment delimiter will be rejected.

Acknowledgment codes

The Quantum Hub recognizes the following HL7 codes as indicating a successful acknowledgment (ACK):

- **AA** Enhanced mode: Application Acknowledgment: Accept
- **CA** Enhanced mode: Accept Acknowledgment: Commit Accept

If the value contained in MSA.01 is any acknowledgment code other than AA or CA, the ACK message is treated as a NAK.

If either of the following conditions occur, the Quantum Hub rejects the acknowledgment and returns an error message indicating the type of error:

- An HL7 ACK message is not included in the acknowledgment response for an HL7 or Observation request
- The HL7 ACK message is not correctly formatted

HL7 ACK message segment specifications

This section provides specifications for each segment of an HL7 ACK message that is submitted to the Quantum Hub for HL7 and Observation acknowledgment request. Message segments include the following:

- [“MSH—Message header segment” on the next page](#)
- [“MSA—Message acknowledgment segment” on page 393](#)

Notes:

- In the following tables, the value 2.3.x indicates both HL7 2.3 and 2.3.1
- The HL7 2.3, 2.3.1, and 2.5.1 ACK message specifications include additional segments (in addition to MSH and MSA), but the Quantum Hub processes only these 2 segments; additional segments defined by HL7 are accepted, but ignored

MSH—Message header segment

The message header (MSH) segment defines the intent, source, destination, and some specifics of the syntax of an HL7 message.

Field	Name	Req'd ^a	Type	Length	Repeat ^b	Comments
MSH.00	Segment Type Identifier	R	ST	4	N	The Quantum Hub verifies that this segment is present in the ACK message.
MSH.01	Field Separator	R	ST	1	N	
MSH.02	Encoding Characters	R	ST	4	N	2.5.1: ^~\& or ^~\&# 2.3.x: ^~\&
MSH.03	Sending Application	RE (2.5.1) O (2.3.x)	HD	227 (2.5.1) 180 (2.3.x)	N	
MSH.04	Sending Facility	R	HD	227 (2.5.1) 180 (2.3.x)	N	The Quantum Hub verifies that this field is populated.
MSH.05	Receiving Application	O	HD	227 (2.5.1) 180 (2.3.x)	N	
MSH.06	Receiving Facility	RE (2.5.1) O (2.3.x)	HD	227 (2.5.1) 180 (2.3.x)	N	The Quantum Hub verifies that this field is populated.
MSH.07	Date/Time of Message	R	TS	26	N	
MSH.08	Security	O	ST	40	N	
MSH.09	Message Type	R	ST	3	N	The Quantum Hub verifies that this field is populated with the accepted value (ACK).
MSH.10	Message Control ID	R	ST	20	N	Any unique number to identify the ACK message. The Quantum Hub verifies that this field is populated.
MSH.11	Processing ID	R	PT	3	N	

^aR = Required, RE = Required, but may be empty, O = Optional, X = Not Supported.

^bY = Field can repeat unlimited number of times, N = No repetition.

Field	Name	Req'd ^a	Type	Length	Repeat ^b	Comments
MSH.12	Version ID	R	VID (2.5.1) ID (2.3.x)	60	N	The value for this field is 2.3, 2.3.1, or 2.5.1. This value must match the HL7 results version that was retrieved. Note: For 2.5.1, the first subfield supports the version ID and that is the only subfield used; the rest of the field is ignored.
MSH.13	Sequence Number	O	NM	15	N	
MSH.14	Continuation Pointer	O	ST	180	N	
MSH.15	Accept Acknowledgment Type	R (2.5.1) O (2.3.x)	ID	2	N	This must be populated with AL (Always).
MSH.16	Application Acknowledgment Type	R (2.5.1) O (2.3.x)	ID	2	N	This must be populated with NE (Never).
MSH.17	Country Code	O	ID	3 (2.5.1) 2 (2.3.x)	N	
MSH.18	Character Set	O	ID	16	Y	
MSH.19	Principal Language of Message	O	CE	250 (2.5.1) 60 (2.3.x)	N	
MSH.20	Alternate Character Set Handling Scheme	O (2.5.1) X (2.3.x)	ID (2.5.1) X (2.3.x)	20 (2.5.1) X (2.3.x)	N	
MSH.21	Message Profile Identifier	R (2.5.1) X (2.3.x)	EI_GU (2.5.1) X (2.3.x)	427 (2.5.1) X (2.3.x)	Y (2.5.1) N (2.3.x)	

^aR = Required, RE = Required, but may be empty, O = Optional, X = Not Supported.

^bY = Field can repeat unlimited number of times, N = No repetition.

MSA—Message acknowledgment segment

The message acknowledgment (MSA) segment defines an acknowledgment (ACK) message that is returned for a result.

Field	Name	Req'd ^a	Type	Length	Repeat ^b	Comments
MSA.00	Segment Type Identifier	R	ST	4	N	The Quantum Hub verifies that this segment is present in the ACK message.
MSA.01	Acknowledgment Code	R	ID	2	N	The Quantum Hub verifies that this field is populated with a valid value. See “ Acknowledgment codes ” on page 390 for valid values.
MSA.02	Message Control ID	R	ST	20	N	The message control ID returned in MSH.10 (Message Control ID) from the result message. The Quantum Hub verifies that this field is populated.
MSA.03	Text Message	O	ST	80	N	
MSA.04	Expected Sequence Number	O	ST (2.5.1) NM (2.3.x)	15	N	
MSA.05	Delayed Acknowledgment Type	O	X (2.5.1) ID (2.3.x)	X (2.5.1) 1 (2.3.x)	N	
MSA.06	Error Condition	O	CE	250 (2.5.1) 100 (2.3.x)	N	

Sample HL7 2.3x ACK messages

The following is an example of a properly constructed ACK message:

```
MSH|^~\&|TESTID|19931000|LAB|STL|20242091128||ACK|1395138733268|P|2.3.1  
MSA|CA|80000000000032521197
```

The following is an example of a properly constructed NAK message:

```
MSH|^~\&|TESTID|19931000|LAB|STL|20242091128||ACK|1395138733268|P|2.3.1  
MSA|CR|80000000000032521197|Invalid Check Sum
```

^aR = Required, O = Optional.

^bY = Field can repeat unlimited number of times, N = No repetition.

Sample HL7 LRI 2.5.1 ACK messages

The following is an example of a properly constructed ACK message:

```
MSH|^~\&|TESTID|19931000|LAB|STL|20242091128||ACK|1395138733268|P|2.5.1|||AL|NE|||||
LRI_NG_RN_Profile^^2.16.840.1.113883.9.20^ISO
MSA|CA|800000000000032521197
```

The following is an example of a properly constructed NAK message:

```
MSH|^~\&|TESTID|19931000|LAB|STL|20242091128||ACK|1395138733268|P|2.5.1|||AL|NE|||||
LRI_NG_RN_Profile^^2.16.840.1.113883.9.20^ISO
MSA|CR|800000000000032521197|Invalid Check Sum
```

Sample acknowledgment requests and responses

This section provides sample acknowledgment requests and responses for each of the following results types:

- [“Sample acknowledgment requests and responses—HL7” below](#)
- [“Sample acknowledgment requests and responses—printable \(PDF\)” on the next page](#)
- [“Sample acknowledgment requests and responses—observation” on page 396](#)

Sample acknowledgment requests and responses—HL7

The following are sample acknowledgment requests and responses for the receipt of HL7 results.

Acknowledgment request for a single HL7 result

```
{
  "resultServiceType": "hl7",
  "requestId": "95082277c0a838010157bedfc9f573b3",
  "ackMessages":
  [
    {
      "message": "TVNIIF5+XCZ8fDEyMzQ1Njd8... Base64-encoded content truncated",
      "controlId": "80000000000000081955"
    }
  ]
}
```

Acknowledgment response for a single HL7 result—positive

```
{
  "isMore": false,
  "requestId": "95082277c0a838010157bedfc9f573b3",
  "results": null,
  "errorMessages": null,
  "providerAccounts": null
}
```

Acknowledgment request for multiple HL7 results

```
{
  "resultServiceType": "hl7",
  "requestId": "a48ea876ac12642b0128f380415f9b99",
  "ackMessages":
```

```
[
  {
    "message": "TVNIff5+XCZ8fERZTkFNSUNf... Base64-encoded content truncated",
    "controlId": "800000000000000083014"
  },
  {
    "message": "TVNIff5+XCZ8fERZTkFNSUNf... Base64-encoded content truncated",
    "controlId": "800000000000000083015"
  },
  {
    "message": "TVNIff5+XCZ8fERZTkFNSUNf... Base64-encoded content truncated",
    "controlId": "800000000000000083017"
  }
]
}
```

Acknowledgment response for multiple HL7 results—positive

```
{
  "isMore": false,
  "requestId": "a48ea876ac12642b0128f380415f9b99",
  "results": null,
  "errorMessages": null,
  "providerAccounts": null
}
```

Acknowledgment response for multiple HL7 results—negative

```
{
  "isMore": false,
  "requestId": "a48ea876ac12642b0128f380415f9b99",
  "results": null,
  "errorMessages": ["Invalid result service type - invalid"],
  "providerAccounts": null
}
```

Sample acknowledgment requests and responses—printable (PDF)

The following are sample acknowledgment requests and responses for the receipt of Printable (PDF) results.

Acknowledgment request for a printable (PDF) result

```
{
  "resultServiceType": "printable",
  "requestId": "a3582bd5ac12642b01b7651489512f2e",
  "requestParameters": [
    {
      "parameterName": "messageControlId", "parameterValue": "800000000000000081913-823234"
    },
    {
      "parameterName": "providerAcctId", "parameterValue": "34387"
    }
  ]
}
```

Acknowledgment response for a printable (PDF) result—positive

```
{
  "isMore": false,
  "requestId": "a3582bd5ac12642b01b7651489512f2e",
  "results": null,
  "errorMessages": null,
  "providerAccounts": null
}
```

Acknowledgment response for a printable (PDF) result—negative

```
{
  "isMore": false,
  "requestId": "a3582bd5ac12642b01b7651489512f2e",
  "results": null,
  "errorMessages": ["Invalid provider account id: nnnn"],
  "providerAccounts": null
}
```

Sample acknowledgment requests and responses—observation

The following are sample ACK requests and responses for the receipt of observation results.

Caution! The `ControlID` value of the acknowledgment request for an observation result must be the value that was received in the `ResultID` field in the observation retrieve results response; otherwise, the message will not be acknowledged.

See “[getResults response for observation results](#)” on page 388 for a sample observation retrieve results response message.

Acknowledgment request for an observation result

```
{
  "resultServiceType": "observation",
  "requestId": "a34e1810ac12642b011aac77be480693",
  "ackMessages":
  [
    {
      "message": "TVNIffF5+XCZ8fERZTkFNSUNf... Base64-encoded content truncated",
      "controlId": "a34e1fe2ac12642b012e9ca879c3dfee"
    }
  ]
}
```

Acknowledgment response for an observation result—positive

```
{
  "isMore": false,
  "requestId": "a34e1810ac12642b011aac77be480693",
  "results": null,
  "errorMessages": null,
  "providerAccounts": null
}
```

Acknowledgment response for an observation result—negative

```
{
  "isMore": false,
  "requestId": "a48ea876ac12642b0128f380415f9b991",
  "results": null,
  "errorMessages":
  [
    "The request id provided in the acknowledgment is invalid:
      a48ea876ac12642b0128f380415f9b991"
  ],
  "providerAccounts": null
}
```

JAX-RS (RESTful) Results Retrieval web service endpoints

Your client application can access the JAX-RS (RESTful) Results Retrieval web service via the endpoints provided in this section. There is a unique endpoint for each method, as well as for each of the following Quantum Hub environments:

- **Certification.** Use this environment for developing, testing, and certifying your client application. For the Certification environment endpoints, see “[Certification environment](#)” below
- **Production.** Use this environment after your client application has been certified. For the Production environment endpoints, see “[Production environment](#)” below

Note: Your Quest credentials are required in order to access Quantum Hub web services such as endpoints. For the Production environment, your credentials are issued once your client application has been developed, tested, and certified.

Certification environment

To access the JAX-RS results retrieval web service in the Certification environment, access the following links:

getResults endpoint

<https://certhubservices.quantum.com/hub-resource-server/oauth2/result/getResults>

acknowledgeResults endpoint

<https://hubservices.quantum.com/hub-resource-server/oauth2/result/acknowledgeResults>

Production environment

Once you have developed, tested, and certified your client application in the Certification environment, you can then update the application to work in the Production environment. Connecting a client application to the Production environment is similar to connecting to the Certification environment (the exposed interfaces are equivalent).

Note: Client applications developed against the Certification environment can also be used to access the Production environment, and vice versa; the web service is identical in both environments.

To access the JAX-RS results retrieval web service in the Production environment, access the following links:

getResults endpoint

<https://hubservices.quantum.com/hub-resource-server/oauth2/result>

acknowledgeResults endpoint

<https://hubservices.quantum.com/hub-resource-server/oauth2/result>

Chapter 13: JAX-WS (SOAP) Results Retrieval web service

In this chapter:

- About the JAX-WS (SOAP-Based) Results Retrieval web service 400
- Best practices for using the SOAP-Based Results Retrieval web service 401
- JAX-WS Results Retrieval web service API 402
- Results Retrieval web service XML schema 409
- JAX-WS Results Retrieval web service WSDL 412
- Sample SOAP-based results retrieval and responses 415
- Acknowledging the receipt of results 418
- About the WSDL interface document 429

About the JAX-WS (SOAP-Based) Results Retrieval web service

This chapter provides details about the SOAP-Based Results Retrieval web service calls provided by Quantum Hub. The Results Retrieval web service provides operations for retrieving the following lab results types from the Quantum Hub results database:

- **HL7 results.** The client application can retrieve and acknowledge an individual results message, or a group of results messages in HL7 format
- **Printable (PDF) results.** The client application can retrieve and acknowledge a Printable lab results document (in PDF)
- **Observation results.** The client application can retrieve and acknowledge results as a bundle of HL7 messages and PDF documents. A configuration option, *Send Document Types*, determines the type of PDF documents (clinical, enhanced, or both) that are delivered in the HL7 bundle

In conjunction with the Results Retrieval web service, the following settings also affect results retrieval, and are pre-configured for the associated Hub account:

- **HL7 Version.** Specifies the results HL7 version that you are able to receive and process
- **Results Filter.** Specifies whether or not obsolete and/or duplicate results are **not** sent to you
- **Finals Only.** Specifies whether you will receive partial and final results, or final results only

To access this web service using OAuth 2.0 authentication, a valid OAuth2 token is required.

For more information

- For details about the Results Retrieval web service, see [“JAX-WS Results Retrieval web service API” on page 402](#)
- For information about acknowledging retrieved results, see [“Acknowledging the receipt of results” on page 418](#)
- For information about accessing the Results Retrieval web service WSDL document, see [“About the WSDL interface document” on page 429](#)
- For HL7 lab result message specifications, see [Chapter 15, “Lab results HL7 2.3/2.3.1 specification” beginning on page 441](#) or [Chapter 16, “Lab results HL7 LRI 2.5.1 specification” beginning on page 485](#)

Best practices for using the SOAP-Based Results Retrieval web service

This section describes the best practices that you should follow when creating a client application to interact with the SOAP-based results retrieval web service. Following these best practices will help minimize any technical or performance issues that might otherwise result from invalid or inappropriate use of the web service.

Results Retrieval web service best practices

The following best practices are specific to the Results Retrieval web service:

- **Limit the frequency of results requests.** If an initial results request returns no results, wait at least 5 minutes before resubmitting the same request. After results are received from the initial request, process and acknowledge those results, and then immediately retrieve any remaining results (while the `isMore` attribute of the `retrieveResultsResponse` object is `true`), and process and acknowledge those results as well (until `isMore` is `false`). Then, wait several minutes before submitting the next initial request for results
- **Specify the maximum number of results to return.** When requesting results, specify (using the `maxMessages` attribute of the `requestParameters` object) the maximum number of results to be returned; otherwise, the maximum default defined for the Quantum Hub is used. The default max values are 1000 for HL7 and 50 for Observation.

Note: If you specify a `maxMessages` value higher than the Quantum Hub default value, then the default value is used.

- **Acknowledge all retrieved results.** After retrieving results using the `getResults` method, you must acknowledge each retrieved result using the `acknowledgeResults` method. This applies to HL7, Printable (PDF), and Observation results. Acknowledging results is important, as it removes the result from the Quantum Hub retrieval queue, preventing the same result from being retrieved multiple times with successive `getResults` requests
- **Do not submit duplicate acknowledgments.** Do not submit more than 1 acknowledgment for the same result. If the Quantum Hub receives duplicate acknowledgment within the same second, it rejects them with a system exception
- **Do not ignore ACK response errors.** For each acknowledgment request submitted to the Quantum Hub, the Quantum Hub returns an acknowledgment response, indicating that the acknowledgment was successfully received, and also whether any errors were contained in the ACK message (for HL7 or Observation results). If the acknowledgment response reports an error condition, you must resolve the error so that the results can be properly acknowledged

Notes:

- An acknowledgment request must specify the same results type (HL7, Printable, or Observation) as the retrieved results
- When acknowledging HL7 or Observation results, the HL7 ACK message must use the same HL7 version as the retrieved results message
- For more information about acknowledging results, see [“Acknowledging the receipt of results” on page 418](#)

JAX-WS Results Retrieval web service API

This section provides details on the methods and objects provided by the Results Retrieval web service.

Results retrieval methods

The following is a brief overview of each method provided by the Results Retrieval web service. (Usage details for each method are provided in “[JAX-WS Results Retrieval web service API](#)” above.)

- **getResults.** This queries the Quantum Hub for results
- **acknowledgeResults.** This acknowledges the results that are retrieved using [getResults](#)

getResults

This method queries the Quantum Hub for results.

The [retrieveResultsRequest](#) object can be used to specify parameters for the query. This method queries for new results (those that have not yet been acknowledged) of the specified type that have been received for the Hub account associated with the authenticated user.

[getResults](#) returns 1 of the following, based on the results type specified:

- **HL7 results.** This returns HL7 messages in a [retrieveResultsResponse](#) object, which contains the HL7 messages as an array of [hl7Message](#) objects. Each [hl7Message](#) object contains an HL7 message encoded as a `base64Binary`. The [retrieveResultsResponse](#) object also contains an array of error messages (if any) and a request ID, and indicates whether or not more results exist for the query.
If PDFs are included as part of the result:
 - The PDFs are embedded in the HL7 message, if the Hub account is configured to do so; otherwise, no PDFs are returned with the HL7
 - If the Hub account is configured for PDFs to be returned, the Hub account configuration also determines which type of PDF (clinical, enhanced, or both) is embedded in the HL7 message
- **Printable results.** This returns a PDF file encoded as an array of bytes, and some information about the data (`ResultInfo`). The [retrieveResultsResponse](#) object also contains an array of error messages (if any) and a request ID, and indicates whether or not more results exist for the query
- **Observation results.** This returns a bundle of HL7 messages and PDF formatted documents. The [retrieveResultsResponse](#) object also contains an array of error messages (if any) and a request ID, and indicates whether or not more results exist for the query. A Hub account configuration option determines the types of PDFs (clinical, enhanced, or both) that are delivered

Method signature:

```
public retrieveResultsResponse getResults(retrieveResultsRequest resultRequest)
    throws SOAPException
```

acknowledgeResults

This method acknowledges the results that are received using [getResults](#). It returns error messages (if any) in the [retrieveResultsResponse](#) object; if there are no errors, then the object will be empty.

Each result that is received must be acknowledged. The requirements for acknowledging each of the results types are outlined below:

- **HL7 results.** The following attributes must be specified for the `ackResultsRequest` object when acknowledging HL7 results:
 - **resultServiceType.** This must be `HL7`
 - **requestId.** This contains the request ID (received in the `retrieveResultsResponse` object) identifying the results that are being acknowledged
 - **ackMessages.** This contains 1 or more HL7 ACK messages (one for each HL7 result received) and corresponding `controlId` (optional; this is for informational purposes only). The ACK message must be formatted as outlined in “[HL7 ACK message segment specifications](#)” on page 419
- **Printable results.** The following attributes must be specified for the `ackResultsRequest` object when acknowledging Printable (PDF) results:
 - **resultServiceType.** This must be `Printable`
 - **requestId.** This contains the request ID (received in the `retrieveResultsResponse` object) identifying the result document that is being acknowledged
 - **requestParameters.** This contains the following parameters:
 - **messageControlId.** The `messageControlId` (received in the `resultInfo` object) identifying the result document
 - **providerAcctId.** The provider account ID (received in the `resultInfo` object) identifying the result document
 - **rejectionReason.** This is used to explain a negative acknowledgment (NAK), and is required only if a NAK is returned
- **Observation results.** The following attributes must be specified for the `ackResultsRequest` object when acknowledging Observation results:
 - **resultServiceType.** This must be `Observation`
 - **requestId.** This contains the request ID (received in the `retrieveResultsResponse` object) identifying the results that are being acknowledged
 - **ackMessages.** This contains 1 or more HL7 ACK messages (1 for each Observation result received) and corresponding `controlId` (which is required; it represents the external bundle ID). An ACK message applies to the entire Observation; partial ACKs are not supported. The ACK message must be formatted as outlined in “[HL7 ACK message segment specifications](#)” on page 419

Note: For additional information acknowledging results, see “[Acknowledging the receipt of results](#)” on page 418.

For a sample acknowledgment request and response, see “[Sample acknowledgment requests and responses](#)” on page 424.

Method signature

```
public retrieveResultsResponse acknowledgeResults(@WebParam(name = "...")
ackResultsRequest ack) throws SOAPException
```

Results Retrieval objects

The Results Retrieval web service provides the following objects.

retrieveResultsRequest

This sets parameters to confine the [getResults](#) query. The `resultServiceType` attribute is required. The query returns all of the latest results of the specified type associated with the Hub account for the authorized user.

By setting the appropriate attributes, you can use this object to retrieve the desired results type (HL7, Printable, or Observation), as well as specify 1 or more additional parameters using the [requestParameters](#) object.

Attributes that can be set for this object include:

Description/attributes	Data type	Req'd ^a
requestParameters. An array of parameter name/value pairs, used to specify 1 or more parameter values, each as a separate String property.	requestParameters[]	O
resultServiceType. The type of results being requested. Possible values include: <ul style="list-style-type: none">• <code>HL7</code>: HL7 results• <code>Printable</code>: Printable (PDF) results• <code>Observation</code>: a bundle of HL7 messages and PDF documents	String	R

Note: These values are **not** case-sensitive.

requestParameters

This is an array of parameter name/value pairs, used to specify 1 or more parameter values, each as a separate String property.

Note: Parameter names and values are **not** case-sensitive.

Using `parameterName`, you can set the following parameters for this object:

Description/attributes	Data type	Req'd ^b
maxMessages. This specifies the maximum number of messages to return in a single response. (The Quantum Hub has a default maximum that it returns if this attribute is not set.) The Quantum Hub has an upper limit for the value; if you attempt to request more results than the maximum, the Quantum Hub overrides your specification with the default maximum and continues. If a query has more results available than the maximum that it can return, the results response indicates (via the <code>isMore</code> attribute) that there are more results available from the Quantum Hub.	String	O

^aR = Required, O = Optional, C = Conditional.

^bR = Required, O = Optional, C = Conditional.

Description/attributes	Data type	Req'd ^a
messageControllId. The messageControllId (received in the resultInfo object) that identifies a result document.	String	0
providerAcctId. The provider account ID (received in the resultInfo object) that identifies a result document.	String	0
rejectionReason. A description used to explain a negative acknowledgment, if returned.	String	0
parameterValue. The value associated with a corresponding parameter.	String	0

retrieveResultsResponse

This is returned by the [getResults](#) method, containing the requested results, a request ID, and a flag that indicates whether there are more results available for the initial request (associated with the request ID).

Responses for this object include:

Description/attributes	Data type	Req'd ^b
requestId. The request ID that has been associated with this request. This ID is used for acknowledging results.	String	0
isMore. This indicates whether or not more results are available from the Quantum Hub for the query. The value of this attribute is <code>true</code> if there are more results, and <code>false</code> otherwise.	Boolean	0
results. The array of result objects containing the results returned from the query. Each element in the array is an individual HL7 message or result document. This returns a 0 (zero) length array of result objects if the query returns no results.	result[]	0
errorMessages. The array of error messages (if any) associated with this request.	String[]	0

result

Returned by the [getResults](#) method, containing either an HL7 result message or 1 or more result documents. Also includes a result ID and an attributed that indicates the result type (for an Observation result).

Attributes that can be set for this object include:

Description/attributes	Data type	Req'd ^c
documents. The array of resultDocument objects.	resultDocument[]	0

^aR = Required, 0 = Optional, C = Conditional.

^bR = Required, 0 = Optional, C = Conditional.

^cR = Required, 0 = Optional, C = Conditional.

Description/attributes	Data type	Req'd ^a
HL7Message. The HL7 result message content.	hl7Message	0
resultId. The result ID that has been associated with this request.	String	0
resultType. The type of result message (for an Observation result). Possible values include:	String	0
<ul style="list-style-type: none"> LAB: Lab result 		

resultDocument

This is returned by the [result](#) object for a Printable (PDF) result, containing a Base64-encoded document.

Attributes that can be set for this object include:

Description/attributes	Data type	Req'd ^b
documentData. The Base64-encoded document.	base64Binary[]	0
documentId. The document ID.	String	0
fileMimeType. The MIME type of the file in the byte array.	String	0
fileName. The name of the file.	String	0
resultInfo. The result information, which contains information about this result.	resultInfo	0

resultInfo

This object provides additional information about a result being returned, which can be useful for identifying the result.

Attributes that can be set for this object include:

Description/attributes	Data type	Req'd ^c
arrivalDate. The arrival date of the results.	Date	0
messageControlId. The message control ID.	String	0
providerAcctId. The provider account ID.	String	0

^aR = Required, O = Optional, C = Conditional.

^bR = Required, O = Optional, C = Conditional.

^cR = Required, O = Optional, C = Conditional.

hl7Message

This object is returned by the [result](#) object, containing a Base64-encoded HL7 message. Depending on the Hub account configuration, PDF documents might be embedded in the HL7 message.

Attributes that can be set for this object include:

Description/attributes	Data type	Req'd ^a
controlId. The message control ID of the HL7 message.	String	0
message. The Base64-encoded HL7 message.	base64Binary[]	0

ackResultsRequest

This object provides information about the results and/or associated documents, if any, being acknowledged.

Attributes that can be set for this object include:

Description/attributes	Data type	Req'd ^b
ackMessages. The HL7 ACK message content (for HL7 or Observation results only).	hl7Message	0
requestId. The request ID (received in the retrieveResultsResponse object) identifying the results that are being acknowledged.	String	0
requestParameters. An array of parameter name/value pairs, used to specify one or more parameter values, each as a separate String property.	requestParameters[]	0
resultServiceType. The type of results being acknowledged. Possible values include: <ul style="list-style-type: none">• HL7: HL7 results• Printable: Printable (PDF) results• Observation: a bundle of HL7 messages and PDF documents	String	R

Note: This value must match the `resultServiceType` value specified in the corresponding [retrieveResultsRequest](#).

^aR = Required, O = Optional, C = Conditional.

^bR = Required, O = Optional, C = Conditional.

acknowledgeResultsResponse

This object is returned by the `acknowledgeResults` method, containing the outbound acknowledgment response.

Responses include:

Description/attributes	Data type	Req'd ^a
AckResult. This contains the acknowledgment response details, including the request ID, a flag that indicates whether there are more results available for the initial request (associated with the request ID), and any error messages used to explain a NAK (if returned).	<code>retrieveResultsResponse</code>	O

^aR = Required, O = Optional, C = Conditional.

Results Retrieval web service XML schema

The messages that are sent to, or retrieved from, the Quantum Hub to retrieve results via the Results Retrieval web service must conform to the following XML schema:

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:ns0="http://QuantumSolutions.com/results" xmlns:xsd-
d="http://www.w3.org/2001/XMLSchema" targetNamespace="http://QuantumSolutions.com/results">
  <xsd:complexType name="acknowledgeResults">
    <xsd:sequence>
      <xsd:element name="RetrieveResultsAcknowledge" type="ns0:ackResultsRequest"
form="qualified" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="acknowledgeResultsResponse">
    <xsd:sequence>
      <xsd:element name="AckResult" type="ns0:retrieveResultsResponse" form-
m="qualified" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="getProviderAccounts"/>
  <xsd:complexType name="getProviderAccountsResponse">
    <xsd:sequence>
      <xsd:element name="ProviderAccounts" type="ns0:retrieveResultsResponse"
form="qualified" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="getResults">
    <xsd:sequence>
      <xsd:element name="RetrieveResultsRequest" type-
e="ns0:retrieveResultsRequest" form="qualified" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="getResultsResponse">
    <xsd:sequence>
      <xsd:element name="Results" type="ns0:retrieveResultsResponse" form-
m="qualified" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="SOAPException">
    <xsd:sequence>
      <xsd:element name="message" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="ackResultsRequest">
    <xsd:sequence>
      <xsd:element name="ackMessages" type="ns0:hl7Message" minOccurs="0" maxOc-
curs="unbounded" nillable="true"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>
```

```

        <xsd:element name="requestId" type="xsd:string" minOccurs="0"/>
        <xsd:element name="requestParameters" type="ns0:requestParameter" minOccurs="0" maxOccurs="unbounded" nillable="true"/>
        <xsd:element name="resultServiceType" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="hl7Message">
    <xsd:sequence>
        <xsd:element name="controlId" type="xsd:string" minOccurs="0"/>
        <xsd:element name="message" type="xsd:base64Binary" minOccurs="0"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="requestParameter">
    <xsd:sequence>
        <xsd:element name="parameterName" type="xsd:string" minOccurs="0"/>
        <xsd:element name="parameterValue" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="retrieveResultsResponse">
    <xsd:sequence>
        <xsd:element name="errorMessages" type="xsd:string" minOccurs="0" maxOccurs="unbounded" nillable="true"/>
        <xsd:element name="isMore" type="xsd:boolean" minOccurs="0"/>
        <xsd:element name="providerAccounts" type="ns0:providerAccount" minOccurs="0" maxOccurs="unbounded" nillable="true"/>
        <xsd:element name="requestId" type="xsd:string" minOccurs="0"/>
        <xsd:element name="results" type="ns0:result" minOccurs="0" maxOccurs="unbounded" nillable="true"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="providerAccount">
    <xsd:sequence>
        <xsd:element name="providerAccountName" type="xsd:string" minOccurs="0"/>
        <xsd:element name="providerName" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="result">
    <xsd:sequence>
        <xsd:element name="HL7Message" type="ns0:hl7Message" minOccurs="0"/>
        <xsd:element name="documents" type="ns0:resultDocument" minOccurs="0" maxOccurs="unbounded" nillable="true"/>
        <xsd:element name="resultId" type="xsd:string" minOccurs="0"/>
        <xsd:element name="resultType" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="resultDocument">
    <xsd:sequence>
        <xsd:element name="documentData" type="xsd:base64Binary" minOccurs="0"/>
        <xsd:element name="documentId" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>

```

```

    <xsd:element name="fileMimeType" type="xsd:string" minOccurs="0"/>
    <xsd:element name="fileName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="resultInfo" type="ns0:resultInfo" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="resultInfo">
  <xsd:sequence>
    <xsd:element name="arrivalDate" type="xsd:dateTime" minOccurs="0"/>
    <xsd:element name="messageControlId" type="xsd:string" minOccurs="0"/>
    <xsd:element name="providerAcctId" type="xsd:string" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="retrieveResultsRequest">
  <xsd:sequence>
    <xsd:element name="providerAccounts" type="ns0:providerAccount" minOccurs="0" maxOccurs="unbounded" nillable="true"/>
    <xsd:element name="requestParameters" type="ns0:requestParameter" minOccurs="0" maxOccurs="unbounded" nillable="true"/>
    <xsd:element name="resultServiceType" type="xsd:string" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:element name="acknowledgeResults" type="ns0:acknowledgeResults"/>
<xsd:element name="acknowledgeResultsResponse" type="ns0:acknowledgeResultsResponse"/>
<xsd:element name="getProviderAccounts" type="ns0:getProviderAccounts"/>
<xsd:element name="getProviderAccountsResponse" type="ns0:getProviderAccountsResponse"/>
<xsd:element name="getResults" type="ns0:getResults"/>
<xsd:element name="getResultsResponse" type="ns0:getResultsResponse"/>
<xsd:element name="SOAPException" type="ns0:SOAPException"/>
</xsd:schema>

```

JAX-WS Results Retrieval web service WSDL

The messages that are sent to, or retrieved from, the Quantum Hub to retrieve results via the Results Retrieval web service must conform to the following Web Services Definition Language (WSDL):

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<!-- Generated by JAX-WS RI (http://JAX-ws.java.net). RI's version is JAX-WS RI
2.3.0-b170407.2038 svn-revision#2eaca54d17a59d265c6fe886b7fd0027836c766c. -->
<definitions targetNamespace="http://QuantumSolutions.com/results" name-
e="RetrieveResultsService" xmlns="http://schemas.xmlsoap.org/wsdl/" xmlns:wsp-
p="http://www.w3.org/ns/ws-policy" xmlns:wsu="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd" xmlns:wsp1_2="h-
ttp://schemas.xmlsoap.org/ws/2004/09/policy" xmlns:tns-
s="http://QuantumSolutions.com/results" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:wsam-
m="http://www.w3.org/2007/05/addressing/metadata">
  <types>
    <xsd:schema>
      <xsd:import namespace="http://QuantumSolutions.com/results" schem-
aLocation="RetrieveResultsService_schema1.xsd"/>
    </xsd:schema>
  </types>
  <message name="getResults">
    <part name="parameters" element="tns:getResults"/>
  </message>
  <message name="getResultsResponse">
    <part name="parameters" element="tns:getResultsResponse"/>
  </message>
  <message name="SOAPException">
    <part name="fault" element="tns:SOAPException"/>
  </message>
  <message name="getProviderAccounts">
    <part name="parameters" element="tns:getProviderAccounts"/>
  </message>
  <message name="getProviderAccountsResponse">
    <part name="parameters" element="tns:getProviderAccountsResponse"/>
  </message>
  <message name="acknowledgeResults">
    <part name="parameters" element="tns:acknowledgeResults"/>
  </message>
  <message name="acknowledgeResultsResponse">
    <part name="parameters" element="tns:acknowledgeResultsResponse"/>
  </message>
  <portType name="RetrieveResultsPortType">
    <operation name="getResults">
      <input wsam:Ac-
tion="http://QuantumSolutions.com/results/RetrieveResultsPortType/getResultsRequest"
message="tns:getResults"/>
      <output
```

```

wsam:Ac-
tion="http://QuantumSolutions.com/results/RetrieveResultsPortType/getResultsResponse"
message="tns:getResultsResponse"/>
    <fault message="tns:SOAPException" name="SOAPException" wsam:Ac-
tion-
="h-
ttp://QuantumSolu-
tions.com/results/RetrieveResultsPortType/getResults/Fault/SOAPException"/>
    </operation>
    <operation name="getProviderAccounts">
        <input wsam:Ac-
tion-
="h-
ttp://QuantumSolu-
tions.com/results/RetrieveResultsPortType/getProviderAccountsRequest"
message="tns:getProviderAccounts"/>
            <output wsam:Ac-
tion-
="h-
ttp://QuantumSolu-
tions.com/results/RetrieveResultsPortType/getProviderAccountsResponse"
message="tns:getProviderAccountsResponse"/>
                <fault message="tns:SOAPException" name="SOAPException" wsam:Ac-
tion-
="h-
ttp://QuantumSolu-
tions.com/results/RetrieveResultsPortType/getProviderAccounts/Fault/SOAPException"/>
                </operation>
                <operation name="acknowledgeResults">
                    <input wsam:Ac-
tion-
="h-
ttp://QuantumSolutions.com/results/RetrieveResultsPortType/acknowledgeResultsRequest"
message="tns:acknowledgeResults"/>
                        <output wsam:Ac-
tion-
="h-
ttp://QuantumSolu-
tions.com/results/RetrieveResultsPortType/acknowledgeResultsResponse"
message="tns:acknowledgeResultsResponse"/>
                            <fault message="tns:SOAPException" name="SOAPException" wsam:Ac-
tion-
="h-
ttp://QuantumSolu-
tions.com/results/RetrieveResultsPortType/acknowledgeResults/Fault/SOAPException"/>
                            </operation>
                        </portType>
                    <binding name="RetrieveResultsPortTypePortBinding" type-
="tns:RetrieveResultsPortType">

```

```

    <soap:binding transport="http://schemas.xmlsoap.org/soap/http" style-
e="document"/>
    <operation name="getResults">
      <soap:operation soapAction=""/>
      <input>
        <soap:body use="literal"/>
      </input>
      <output>
        <soap:body use="literal"/>
      </output>
      <fault name="SOAPException">
        <soap:fault name="SOAPException" use="literal"/>
      </fault>
    </operation>
    <operation name="getProviderAccounts">
      <soap:operation soapAction=""/>
      <input>
        <soap:body use="literal"/>
      </input>
      <output>
        <soap:body use="literal"/>
      </output>
      <fault name="SOAPException">
        <soap:fault name="SOAPException" use="literal"/>
      </fault>
    </operation>
    <operation name="acknowledgeResults">
      <soap:operation soapAction=""/>
      <input>
        <soap:body use="literal"/>
      </input>
      <output>
        <soap:body use="literal"/>
      </output>
      <fault name="SOAPException">
        <soap:fault name="SOAPException" use="literal"/>
      </fault>
    </operation>
  </binding>
  <service name="RetrieveResultsService">
    <port name="RetrieveResultsPortTypePort" bind-
ing="tns:RetrieveResultsPortTypePortBinding">
      <soap:address location="http://localhost:7001/results/retrieval/service"/>
    </port>
  </service>
</definitions>

```

Sample SOAP-based results retrieval and responses

This section provides sample results requests and responses for the Results Retrieval web service.

Retrieve results request

The following is a sample HL7 results retrieval request. The format is the same for both Printable and Observation results messages, with the exception of the `resultServiceType` value.

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:res="http://quanum.com/results">
  <soapenv:Header/>
  <soapenv:Body>
    <res:getResults>
      <res:RetrieveResultsRequest>
        <!--Zero or more repetitions:-->
        <requestParameters>
          <parameterName>maxMessages</parameterName>
          <parameterValue>2</parameterValue>
        </requestParameters>
        <resultServiceType>hl7</resultServiceType>
      </res:RetrieveResultsRequest>
    </res:getResults>
  </soapenv:Body>
</soapenv:Envelope>
```

Retrieve results responses

The following are sample response message for each of the results types that can be retrieved (HL7, Printable, and Observation).

HL7 retrieve results response

```
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:getResultsResponse xmlns:ns2="http://quanum.com/results">
      <ns2:Results>
        <isMore>true</isMore>
        <requestId>bde79b1dac1262891b5b7a8b3f30a869</requestId>
        <results>
          <HL7Message>
            <controlId>80000000000000001357</controlId>
            <message>TVNIff5+XCZ8TEFCfEJyZW50IFByb3ZpZGVyf... Base64-
encoded content truncated
          </message>
        </HL7Message>
      </results>
      <results>
        <HL7Message>
          <controlId>80000000000000001358</controlId>
```

```

    <message>TVN1fF5+XCZ8TEFCfEJyZW50IFByb3ZpZGVyf...  Base64-
encoded content truncated
  </message>
</HL7Message>
</results>
</ns2:Results>
</ns2:getResultsResponse>
</S:Body>
</S:Envelope>

```

Printable retrieve results response

```

<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:getResultsResponse xmlns:ns2="http://quanum.com/results">
      <ns2:Results>
        <isMore>true</isMore>
        <requestId>bde89d8dac1262891b5b7a8bab0be62b</requestId>
        <results>
          <documents>
            <documentData>JVBERi0xLjMNJeLjz9MNMSAwIG9iago8...  Base64-
encoded content truncated
            </documentData>
            <documentId>501718</documentId>
            <fileMimeType>application/pdf</fileMimeType>
            <fileName>result.pdf</fileName>
            <resultInfo>
              <arrivalDate>2024-11-21T14:10:59Z</arrivalDate>
              <messageControlId>bs13-501718</messageControlId>
              <providerAcctId>28853</providerAcctId>
            </resultInfo>
          </documents>
        </results>
      </ns2:Results>
    </ns2:getResultsResponse>
  </S:Body>
</S:Envelope>

```

Observation retrieve results response

```

<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:getResultsResponse xmlns:ns2="http://quanum.com/results">
      <ns2:Results>
        <isMore>true</isMore>
        <requestId>bde926b2ac1262891b5b7a8ba05dbed7</requestId> <!--Note that this
value maps to the requestId field in the Acknowledgment Request for an Observation
Result-->
        <results>
          <documents>
            <documentData>JVBERi0xLjMKJf///8KCjEgMCEvYmoK...  Base64-
encoded content truncated
            </documentData>

```

```

    <documentId>505482</documentId>
    <fileMimeType>application/pdf</fileMimeType>
    <fileName>RFN23MSG4752768405.pdf</fileName>
  </documents>
  <HL7Message>
    <controlId>80000000000000001688</controlId>
    <message>TVNIff5+XCZ8TEFCREVOFEJyZW50IFByb3ZpZ... Base64-
encoded content truncated
    </message>
  </HL7Message>
  <resultId>bde9273fac1262891b652063f6b3aae9</resultId> <!--Note that this
value maps to the controlId field in the Acknowledgment Request for an Observation
Result-->
  <resultType>LAB</resultType>
</results>
<results>
  <documents>
    <documentData>JVBERi0xLjMKJf////8KCjEgMCMvYmoK... Base64-
encoded content truncated
    </documentData>
    <documentId>505483</documentId>
    <fileMimeType>application/pdf</fileMimeType>
    <fileName>RFN23MSG3918340437.pdf</fileName>
  </documents>
  <HL7Message>
    <controlId>80000000000000001689</controlId>
    <message>TVNIff5+XCZ8TEFCREVOFEJyZW50IFByb3ZpZ... Base64-
encoded content truncated
    </message>
  </HL7Message>
  <resultId>bde9274eac1262891b652f6c456df641</resultId>
  <resultType>LAB</resultType>
</results>
</ns2:Results>
</ns2:getResultsResponse>
</S:Body>
</S:Envelope>

```

Acknowledging the receipt of results

When lab results are retrieved from the Quantum Hub using the [getResults](#) method, the retrieving client application must acknowledge (ACK) the results so that they will not be re-sent when the client application makes a subsequent [getResults](#) call. You can acknowledge the receipt of results using the [acknowledgeResults](#) method.

When an acknowledgment request is received by the Quantum Hub, the Quantum Hub replies with an acknowledgment response, indicating whether or not the acknowledgment was successfully received and processed.

This section does not cover **all** of the requirements for constructing an ACK message—only those requirements that are specific to the Quantum Hub.

Note: In the context of this document, a negative acknowledgment (NAK) message is an ACK message that contains an error condition; for example, an Application Error (AE).

Constructing the HL7 ACK message

An HL7 ACK message that is returned to the Quantum Hub in an HL7 or Observation acknowledgment request must contain the following HL7 segments:

- **MSH:** Message header
- **MSA:** Message acknowledgment

Notes:

- This section does **not** apply to acknowledgment requests for Printable (PDF) results, which do not contain an HL7 ACK message
- For details on the MSH and MSA segments, see [“HL7 ACK message segment specifications” on the next page](#)

Each of these segments must be constructed as outlined below:

- **MSH segment.** The MSH segment defines the intent, source, destination, and syntax of an HL7 message. The MSA segment that is returned to the Quantum Hub must be constructed as follows:
 - The content of MSH.04 (*Sending Facility*) and MSH.06 (*Receiving Facility*) must be reversed from what was received in the results message
 - The content of MSH.03 (*Sending Application*) and MSH.05 (*Receiving Application*) should also be reversed from what was received in the original results message, but this is not required
 - MSH.12 is a mandatory field and must contain the message Version ID (2.3, 2.3.1, or 2.5.1)For additional details on the content of the MSH segment, see [“MSH—Message header” on page 420](#).
- **MSA segment.** The MSA segment contains information pertinent to the acknowledgment of another HL7 message. The MSA segment that is returned to the Quantum Hub must be constructed as follows:
 - MSA.01 must contain an acknowledgment code to indicate the status of the most recently received message. Valid Acknowledgment Codes are shown in [“Acknowledgment codes” on the next page](#)
 - MSA.02 must contain a message control ID, which identifies the message that is being acknowledged
 - For NAKs, it is strongly recommended that MSA.03 contain a text message that describes the rejection reason

For additional details on the content of the MSA segment, see [“MSA—Message acknowledgment” on page 422](#).

Newline characters

HL7 ACK messages must use only the carriage return (CR) character (ASCII 0x0D) to indicate a segment delimiter. ACK messages that contain a line feed (LF) character (ASCII 0x0A) or carriage return and line feed characters (CRLF) to indicate a segment delimiter will be rejected.

Acknowledgment codes

The Quantum Hub recognizes the following HL7 codes as indicating a successful acknowledgment (ACK):

- **AA** Enhanced mode: Application Acknowledgment: Accept
- **CA** Enhanced mode: Accept Acknowledgment: Commit Accept

If the value contained in MSA.01 is any acknowledgment code other than **AA** or **CA**, the ACK message is treated as a NAK. If either of the following conditions occur, the Quantum Hub rejects the acknowledgment and returns an error message indicating the type of error:

- An HL7 ACK message is not included in the acknowledgment response for an HL7 or Observation request
- The HL7 ACK message is not correctly formatted

HL7 ACK message segment specifications

This section provides specifications for each segment of an HL7 ACK message that is submitted to the Quantum Hub for HL7 and Observation acknowledgment request. Message segments include the following:

- [“MSH—Message header” on the next page](#)
- [“MSA—Message acknowledgment” on page 422](#)

Notes:

- In the following tables, the value 2.3.x indicates both HL7 2.3 and 2.3.1
- The HL7 ACK message specifications include additional segments (in addition to MSH and MSA), but the Quantum Hub processes only these 2 segments; additional segments defined by HL7 are accepted, but ignored

MSH—Message header

The Message Header (MSH) segment defines the intent, source, destination, and some specifics of the syntax of an HL7 message.

Field	Name	Req'd ^a	Type	Length	Repeat ^b	Comments
MSH.00	Segment Type Identifier	R	ST	4	N	The Quantum Hub verifies that this segment is present in the ACK message.
MSH.01	Field Separator	R	ST	1	N	
MSH.02	Encoding Characters	R	ST	4	N	The following characters are accepted: <ul style="list-style-type: none"> • ^ • ~ • \ • &
MSH.03	Sending Application	RE (2.5.1) O (2.3.x)	HD	227 (2.5.1) 180 (2.3.x)	N	
MSH.04	Sending Facility	R	HD	227 (2.5.1) 180 (2.3.x)	N	The Quantum Hub verifies that this field is populated.
MSH.05	Receiving Application	O	HD	227 (2.5.1) 180 (2.3.x)	N	
MSH.06	Receiving Facility	RE (2.5.1) O (2.3.x)	HD	227 (2.5.1) 180 (2.3.x)	N	The Quantum Hub verifies that this field is populated.
MSH.07	Date/Time of Message	R	TS	26	N	
MSH.08	Security	O	ST	40	N	
MSH.09	Message Type	R	ST	3	N	The Quantum Hub verifies that this field is populated with the accepted value (ACK).
MSH.10	Message Control ID	R	ST	20	N	Any unique number to identify the ACK message.

^aR = Required, RE = Required, but may be empty, O = Optional, X = Not Supported.

^bY = Field can repeat unlimited number of times, N = No repetition.

Field	Name	Req'd ^a	Type	Length	Repeat ^b	Comments
						The Quantum Hub verifies that this field is populated.
MSH.11	Processing ID	R	PT	3	N	
MSH.12	Version ID	R	VID (2.5.1) ID (2.3.x)	60	N	The value for this field is 2.3, 2.3.1, or 2.5.1. This value must match the HL7 results version that was retrieved. Note: For 2.5.1, the first subfield supports the version ID and that is the only subfield used; the rest of the field is ignored.
MSH.13	Sequence Number	O	NM	15	N	
MSH.14	Continuation Pointer	O	ST	180	N	
MSH.15	Accept Acknowledgment Type	R (2.5.1) O (2.3.x)	ID	2	N	This must be populated with AL (Always).
MSH.16	Application Acknowledgment Type	R (2.5.1) O (2.3.x)	ID	2	N	This must be populated with NE (Never).
MSH.17	Country Code	O	ID	3 (2.5.1) 2 (2.3.x)	N	
MSH.18	Character Set	O	ID	16	Y	
MSH.19	Principal Language of Message	O	CE	250 (2.5.1) 60 (2.3.x)	N	
MSH.20	Alternate Character Set Handling Scheme	O (2.5.1) X (2.3.x)	ID (2.5.1) X (2.3.x)	20 (2.5.1) X (2.3.x)	N	
MSH.21	Message Profile Identifier	R (2.5.1) X (2.3.x)	EI_GU (2.5.1) X (2.3.x)	427 (2.5.1) X (2.3.x)	Y (2.5.1) N (2.3.x)	

^aR = Required, RE = Required, but may be empty, O = Optional, X = Not Supported.

^bY = Field can repeat unlimited number of times, N = No repetition.

MSA—Message acknowledgment

The Message Acknowledgment (MSA) segment defines an acknowledgment (ACK) message that is returned for a result.

Field	Name	Req'd ^a	Type	Length	Repeat ^b	Comments
MSA.00	Segment Type Identifier	R	ST	4	N	The Quantum Hub verifies that this segment is present in the ACK message.
MSA.01	Acknowledgment Code	R	ID	2	N	The Quantum Hub verifies that this field is populated with a valid value. See “ Acknowledgment codes ” on page 419 for valid values.
MSA.02	Message Control ID	R	ST	20	N	The message control ID returned in MSH.10 (<i>Message Control ID</i>) from the result message. The Quantum Hub verifies that this field is populated.
MSA.03	Text Message	O	ST	80	N	
MSA.04	Expected Sequence Number	O	ST (2.5.1) NM (2.3.x)	15	N	
MSA.05	Delayed Acknowledgment Type	O	X (2.5.1) ID (2.3.x)	X (2.5.1) 1 (2.3.x)	N	
MSA.06	Error Condition	O	CE	250 (2.5.1) 100 (2.3.x)	N	

Sample HL7 ACK messages

The following is an example of a properly constructed HL7 2.3 ACK message:

```
MSH|^~\&|TESTID|19931000|LAB|STL|202412091128||ACK|1395138733268|P|2.3  
MSA|CA|80000000000032521197
```

The following is an example of a properly constructed HL7 2.3 NAK message:

```
MSH|^~\&|TESTID|19931000|LAB|STL|202412091128||ACK|1395138733268|P|2.3  
MSA|CR|80000000000032521197|Invalid Check Sum
```

^aR = Required, O = Optional.

^bY = Field can repeat unlimited number of times, N = No repetition.

The following is an example of a properly constructed HL7 2.5.1 ACK message:

MSH

```
|^~\&|TESTID|19931000|LAB|STL|202412091128||ACK|1395138733268|P|2.5.1||AL|NE|||||
  LRI_NG_RN_Profile^^2.16.840.1.113883.9.20^ISO
MSA|CA|80000000000032521197
```

The following is an example of a properly constructed HL7 2.5.1 NAK message:

MSH

```
|^~\&|TESTID|19931000|LAB|STL|202412091128||ACK|1395138733268|P|2.5.1||AL|NE|||||
  LRI_NG_RN_Profile^^2.16.840.1.113883.9.20^ISO
MSA|CR|80000000000032521197|Invalid Check Sum
```

Sample acknowledgment requests and responses

This section provides sample acknowledgment requests and responses for each of the following results types:

- “Sample acknowledgment requests and responses—HL7” below
- “Sample acknowledgment requests and responses—Printable (PDF)” on page 426
- “Sample acknowledgment requests and responses—observation” on page 427

Sample acknowledgment requests and responses—HL7

The following are sample acknowledgment requests and responses for the receipt of HL7 results.

Acknowledgment request for a single HL7 result

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:res="http://quanum.com/results">
  <soapenv:Header/>
  <soapenv:Body>
    <res:acknowledgeResults>
      <res:RetrieveResultsAcknowledge>
        <!--Zero or more repetitions:-->
        <ackMessages>
          <controlId>RFN231VMSG9264826067</controlId>
          <message>TVN1ff5+XCZ8fEFITDFYf... Base64-encoded content truncated
            </message>
        </ackMessages>
        <requestId>45561a2b7f0001010299e776899f749e</requestId>
        <resultServiceType>hl7</resultServiceType>
      </res:RetrieveResultsAcknowledge>
    </res:acknowledgeResults>
  </soapenv:Body>
</soapenv:Envelope>
```

Acknowledgment response for single HL7 result—positive

```
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:acknowledgeResultsResponse xmlns:ns2="http://quanum.com/results">
      <ns2:AckResult>
        <isMore>false</isMore>
        <requestId>45561a2b7f0001010299e776899f749e</requestId>
      </ns2:AckResult>
    </ns2:acknowledgeResultsResponse>
  </S:Body>
</S:Envelope>
```

Acknowledgment request for multiple HL7 results

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:res="http://quanum.com/results">
  <soapenv:Header/>
  <soapenv:Body>
    <res:acknowledgeResults>
      <res:RetrieveResultsAcknowledge>
        <!--Zero or more repetitions:-->
```

```

    <ackMessages>
      <controlId>RFN231VMSG9264826067</controlId>
      <message>TVNIff5+XCZ8fEFITDFYf... Base64-encoded content truncated
    </message>
    </ackMessages>
    <ackMessages>
      <controlId>RFN231VMSG9264826069</controlId>
      <message>TVNIff5+XCZ8fEFITDFYf... Base64-encoded content truncated
    </message>
    </ackMessages>
    <ackMessages>
      <controlId>RFN231VMSG9264826070</controlId>
      <message>TVNIff5+XCZ8fEFITDFYf... Base64-encoded content truncated
    </message>
    </ackMessages>
    <ackMessages>
      <controlId>RFN231VMSG9264826071</controlId>
      <message>TVNIff5+XCZ8fEFITDFYf... Base64-encoded content truncated
    </message>
    </ackMessages>
    <requestId>4e56ba697f000101039f4038fd7f2d79</requestId>
    <resultServiceType>hl7</resultServiceType>
  </res:RetrieveResultsAcknowledge>
</res:acknowledgeResults>
</soapenv:Body>
</soapenv:Envelope>

```

Acknowledgment response for multiple HL7 results—positive

```

<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:acknowledgeResultsResponse xmlns:ns2="http://quanum.com/results">
      <ns2:AckResult>
        <isMore>false</isMore>
        <requestId>4e56ba697f000101039f4038fd7f2d79</requestId>
      </ns2:AckResult>
    </ns2:acknowledgeResultsResponse>
  </S:Body>
</S:Envelope>

```

Acknowledgment response for multiple HL7 results—negative

```

<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:acknowledgeResultsResponse xmlns:ns2="http://quanum.com/results">
      <ns2:AckResult>
        <errorMessages>Invalid result service type</errorMessages>
        <isMore>false</isMore>
        <requestId>45561a2b7f0001010299e776899f749e</requestId>
      </ns2:AckResult>
    </ns2:acknowledgeResultsResponse>
  </S:Body>
</S:Envelope>

```

Sample acknowledgment requests and responses—Printable (PDF)

The following are sample acknowledgment requests and responses for the receipt of PDF (Printable) results.

Acknowledgment request for a printable (PDF) result

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:res="http://quanum.com/results">
  <soapenv:Header/>
  <soapenv:Body>
    <res:acknowledgeResults>
      <!--Optional:-->
      <res:RetrieveResultsAcknowledge>
        <requestId>4b1c685a7f00010102d8f6335f928584</requestId>
        <!--Zero or more repetitions:-->
        <requestParameters>
          <parameterName>messageControlId</parameterName>
          <parameterValue>RFN231VMSG9264826067-501315</parameterValue>
        </requestParameters>
        <requestParameters>
          <parameterName>providerAcctId</parameterName>
          <parameterValue>23676</parameterValue>
        </requestParameters>
        <resultServiceType>printable</resultServiceType>
      </res:RetrieveResultsAcknowledge>
    </res:acknowledgeResults>
  </soapenv:Body></soapenv:Envelope>
```

Acknowledgment request for a printable (PDF) result

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:res="http://quanum.com/results">
  <soapenv:Header/>
  <soapenv:Body>
    <res:acknowledgeResults>
      <!--Optional:-->
      <res:RetrieveResultsAcknowledge>
        <requestId>4b4341377f000101039f40387ff092ba</requestId>
        <!--Zero or more repetitions:-->
        <requestParameters>
          <parameterName>messageControlId</parameterName>
          <parameterValue>RFN231VMSG9264826071-502412</parameterValue>
        </requestParameters>
        <requestParameters>
          <parameterName>providerAcctId</parameterName>
          <parameterValue>23676</parameterValue>
        </requestParameters>
        <requestParameters>
          <parameterName>rejectionReason</parameterName>
          <parameterValue>Invalid format</parameterValue>
        </requestParameters>
        <resultServiceType>printable</resultServiceType>
      </res:RetrieveResultsAcknowledge>
    </res:acknowledgeResults>
```

```
</soapenv:Body>
</soapenv:Envelope>
```

Acknowledgment response for a printable (PDF) result—positive

```
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:acknowledgeResultsResponse xmlns:ns2="http://quanum.com/results">
      <ns2:AckResult>
        <isMore>false</isMore>
        <requestId>4b4341377f000101039f40387ff092ba</requestId>
      </ns2:AckResult>
    </ns2:acknowledgeResultsResponse>
  </S:Body>
</S:Envelope>
```

Acknowledgment response for a printable (PDF) result—negative

```
<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:acknowledgeResultsResponse xmlns:ns2="http://quanum.com/results">
      <ns2:AckResult>
        <errorMessages>Invalid value - xxxxx</errorMessages>
        <isMore>false</isMore>
        <requestId>45561a2b7f0001010299e776899f749e</requestId>
      </ns2:AckResult>
    </ns2:acknowledgeResultsResponse>
  </S:Body>
</S:Envelope>
```

Sample acknowledgment requests and responses—observation

The following are sample ACK requests and responses for the receipt of Observation results.

Caution! The ControlID value of the acknowledgment request for an observation result must be the value that was received in the *ResultID* field in the observation retrieve results response; otherwise, the message will not be acknowledged.

See “[Observation retrieve results response](#)” on page 416 for a sample observation retrieve results response message.

Acknowledgment request for an observation result

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:res="http://quanum.com/results">
  <soapenv:Header/>
  <soapenv:Body>
    <res:acknowledgeResults>
      <res:RetrieveResultsAcknowledge>
        <ackMessages>
          <controlId>bde9273fac1262891b652063f6b3aae9</controlId> <!--Note that this value maps from the resultId field in the Observation Retrieve Results Response-->
          <message>TVNIff5+XCZ8fEpBWFdTLUJVtk... Base64-encoded content truncated
          </message>
        </ackMessages>
```

```

    <requestId>bde926b2ac1262891b5b7a8ba05dbed7</requestId> <!--Note that this
value maps from the requestId field in the Observation Retrieve Results Response-->
    <requestParameters>
        <parameterName></parameterName>
        <parameterValue></parameterValue>
    </requestParameters>
    <resultServiceType>observation</resultServiceType>
</res:RetrieveResultsAcknowledge>
</res:acknowledgeResults>
</soapenv:Body>
</soapenv:Envelope>

```

Acknowledgment response for an observation result—positive

```

<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:acknowledgeResultsResponse xmlns:ns2="http://quanum.com/results">
      <ns2:AckResult>
        <isMore>false</isMore>
        <requestId>81527123ac1262891e904be8fcaacd57</requestId>
      </ns2:AckResult>
    </ns2:acknowledgeResultsResponse>
  </S:Body>
</S:Envelope>

```

Acknowledgment response for an observation result—negative

```

<S:Envelope xmlns:S="http://schemas.xmlsoap.org/soap/envelope/">
  <S:Body>
    <ns2:acknowledgeResultsResponse xmlns:ns2="http://quanum.com/results">
      <ns2:AckResult>
        <errorMessages>The request id provided in the acknowledgment is invalid:
          81527123ac1262891e904be8fcaacd57fail</errorMessages>
        <isMore>false</isMore>
        <requestId>81527123ac1262891e904be8fcaacd57fail</requestId>
      </ns2:AckResult>
    </ns2:acknowledgeResultsResponse>
  </S:Body>
</S:Envelope>

```

About the WSDL interface document

In order to utilize a web service, you must develop a web service client application. A client application created for accessing the Results Retrieval web service is referred to as a *static* web service client, because the client knows where the web service is located without looking up the service in a Universal Description, Discovery, and Integration (UDDI) registry. The client calls the web services via a known service URL to obtain the Web Services Definition Language (WSDL) file that describes the web services.

A WSDL interface document describes all of the information that is needed by a web service client to interact with the associated web service. The WSDL document includes the URL to locate the associated web services. Once you have obtained the WSDL, you can build a web service client application that uses the web service to perform the desired functions.

The following section describes how to obtain the WSDL document for the Results Retrieval web service.

Note: Your Quest credentials are required in order to access Quantum Hub web services such as the WSDL interface document. For the Production environment, your credentials are issued once your client application has been developed, tested, and certified.

Accessing the Results Retrieval web service WSDL document

To access the WSDL service description for the Results Retrieval web service, use your browser to access the URL corresponding to one of the following environments:

- **Certification environment.** Use this environment for developing, testing, and certifying your client application. For the Certification environment URL and endpoint, see “[Certification environment](#)” below
- **Production environment.** Use this environment after your client application has been certified. For the Production environment URL and endpoint, see “[Production environment](#)” below

To save the WSDL document, access the document using your browser and then select *File > Save As*.

Certification environment

To access the Results Retrieval web service in the Certification environment, access the following endpoint:

<https://certhubservices.quantum.com/hub-ws-resource-server/oauth2/results/retrieval/service>

Production environment

Once you have developed, tested, and certified your client application in the Certification environment, you can then update the application to work in the Production environment. Connecting a client application to the Production environment is similar to connecting to the Certification environment (the exposed interfaces are equivalent).

Note: Client applications developed against the Certification environment WSDL document can also be used to access the Production environment, and vice versa; the WSDL content is identical in both environments.

To access the Results Retrieval web service in the Production environment, access the following endpoint:

<https://hubservices.quantum.com/hub-ws-resource-server/oauth2/results/retrieval/service>

Chapter 14: Push method for receiving lab results

In this chapter:

- About the results push method for receiving lab results 431
- Connectivity, domain name, and IP requirements 432
- Certificate requirements 433
- Authentication requirements 434
- Status and error messages for results 435
- Sample lab results HL7 LRI 2.5.1 messages 438

About the results push method for receiving lab results

The results push method enables Quantum Hub to deliver or “push” the Quest Diagnostics lab results to your server as soon as the results are available. When the results are on your server, you can disseminate them to your clients as usual.

This chapter provides the information you need to successfully receive lab results from the Quantum Hub, as follows:

- **Connectivity, domain name, and IP requirements.** The HTTPS connectivity option and the requirements for your domain name and IP address. For more information, see [“Connectivity, domain name, and IP requirements” on the next page](#)
- **Certificate requirements.** The conditions that the certificates for your servers must adhere to. For more information, see [“Certificate requirements” on page 433](#)
- **Authentication requirements.** The preemptive authentication that is used for the HTTPS requests sent to your server. For more information, see [“Authentication requirements” on page 434](#)
- **Status and error messages.** The HTTP status codes and HL7 acknowledgment codes that the Quantum Hub expects in response to the HTTPS requests to post result messages to your server. For more information, see [“Status and error messages for results” on page 435](#)

Certification

Before the results can be delivered to your server, you must complete the vendor certification process. Your project implementation manager will provide the details.

Lab result messages

If you want the lab report PDF file in addition to the HL7, the PDF file is encoded in Base64 and embedded in the result message. The lab result message format is outlined in [“Lab results HL7 2.3/2.3.1 message format requirements” on page 443](#) (the segments specific to the embedded PDF file outlined in [“Embedded PDF segments” on page 478](#)) or [“HL7 LRI 2.5.1 results message format requirements” on page 487](#).

Connectivity, domain name, and IP requirements

Connectivity must be via HTTPS with Transport Layer Security (TLS) version 1.2. Earlier versions of TLS are not supported.

The following requirements for your domain and IP address must be met:

- The Fully Qualified Domain Name (FQDN) address must resolve to a static public IP address
- You must use the Quest FQDN with public Domain Name System (DNS) lookups to support the dynamic resolution of the Quest FQDN. Do **not** hard-code IP addresses in hosts files or within application software. Failure to comply will result in an inability to transmit messages to Quest primary and secondary data centers
- EMRs must add the Quest IP addresses for the secondary data center for all Quest environments into their firewalls in order to transmit to and receive from both Quest data centers
- Separate source IP addresses for traffic destined for Quest Certification and Production environments must be established. No overlap of IP addresses is allowed between the 2 environments. This requirement eliminates the chance of accidental transmission of messages between Certification and Production. This is critical because the Certification environment should never contain actual protected health information (PHI), and the Production environment should not contain test information. Vendor employees/contractors may have varying levels of access to PHI; therefore, access to Certification/QA/Development systems should not directly allow access to Production
- TLS connections inbound to Quest must use TCP port 443

Lab result routing

The following table provides the FQDN, port number, and IP address for both of the lab results environments—Certification and Production. The traffic is categorized as inbound and outbound, as follows:

- **Inbound:** Requests from your server to Quest servers
- **Outbound:** Requests from Quest servers to your servers

Environment	FQDN and URL	Port	Quest primary data center	Quest secondary data center
Certification	https://certhubservices.quanum.com	443	Inbound: 216.195.72.50 Outbound: 216.203.80.0/20	Inbound: 216.195.72.50 Outbound: 216.203.80.0/20
Production	https://hubservices.quanum.com	443	Inbound: 216.195.72.151 Outbound: 216.203.80.0/20	Inbound: 216.195.72.151 Outbound: 216.203.80.0/20

Certificate requirements

The following is a list of requirements for your certificates:

- The certificate common name must match the FQDN provided in the URL
- The certificate common name must be an FQDN, not an IP address
- The certificate must be signed by a public Trusted Root Certificate Authority (CA) with a minimum 2048-bit public key:
 - A public Trusted Root CA is a provider that minimally follows the CA operational criteria outlined in either the *WebTrust Principles and Criteria for Certification Authorities* (www.webtrust.org) or the equivalent ANSI/ETSI-TS guidelines
 - The CA must have completed a *WebTrust for Certificate Authorities* (www.webtrust.org) audit or an equivalent third-party attestation. Quest must recognize the Root CA as a valid and trusted entity. For a sample list of Root CAs, see <http://support.microsoft.com/kb/931125>
 - The certificate is not required to be set up specifically or solely for Quest (for example, *Quest.mydomain.com*). The same certificate can be used for multiple sites
 - Generic FQDNs are acceptable in a certificate (for example, *www.mydomain.com*), but must contain your domain name (*mydomain.com*). Quest currently does not support wildcard certificates (for example, **.mydomain.com*)
 - The certificate must be current and active (not expired or revoked). Quest rejects TLS connections with invalid certificates

Authentication requirements

This section provides details on the OAuth 2.0 authentication method.

OAuth 2.0 authentication

Using the OAuth 2.0 method of authentication, the Quantum Hub sets up communication with your server to send messages to your endpoint (eg, orders, results, demographics, messages). When calling the web service, the Quantum Hub will call your endpoint to "get token" first using the credentials configured for the Quantum Hub, then the Quantum Hub will post the message passing the token to your configured endpoint.

Note: If you want the Quantum Hub to use OAuth 2.0 authentication, then you have to provide your endpoints and credentials to the Quantum Hub for getting an OAuth 2.0 token from your site.

The following is an example of an OAuth 2.0 authentication request, which includes the HTTPS header including the token (the first 6 lines) and the HL7 result message:

```
HTTP method: POST
Request content type: text/plain
Headers:
Authorization: Bearer {access_token here}
Accept: text/plain
Content-Type: text/plain
MSH|^~\&|LAB|PHP||73915246|20240727084910||ORU^R01|8000000000002046972|D|2.3.1
PID|1|ABC123|KP042801T|12345|TEST^PATIENT||20101015|M|||||||0915693
ORC|RE|12345|KP042801T||CM||||||1234567890^PROVIDER^TEST^^^^^^^^^^NPI
OBR|1|12345|KP042801T|866^T4, FREE^^866SB=^T4,
FREE|||
2024
0726143000|||||20240727084100||1234567890^PROVIDER^TEST^^^^^^^^^^NPI||||Z99^Quest
Diagnostics-Clifton^1 Insights Drive^Clifton^NJ^07012-2355^Joan K Smith
MD|20240727084700|||F
OBX|1|NM|3024-7^T4 Free SerPl-mCnc^LN^55070600^T4, FREE^QDIPHP||1.9|ng/dL|0.9-
1.4|H|||F|||20240727084700|Z99
OBR|2|12345|KP042801T|899^TSH^^899SB=^TSH|||
2024
0726143000|||||20240727084100||1234567890^PROVIDER^TEST^^^^^^^^^^NPI||||Z99^Quest
Diagnostics-Clifton^1 Insights Drive^Clifton^NJ^07012-2355^Joan K Smith
MD|20240727084700|||F
OBX|1|NM|3016-3^TSH SerPl-aCnc^LN^55080400^TSH^QDIPHP||2.55|mIU/L|0.50-
4.30|N|||F|||20240727084700|Z99
```

Status and error messages for results

When the Quantum Hub sends the HTTPS request to copy the result message to your server, it expects an HTTP response with a status code indicating whether or not the request was successful. If the request was successful, the Quantum Hub expects an HL7 ACK message indicating whether or not the result message was received successfully, as follows:

- For successful requests, send back a 200 HTTP status code and an HL7 ACK message with 1 of the HL7 acknowledgment codes listed in [“HL7 ACK message” on the next page](#)
- For unsuccessful requests, send back 1 of the 400-level or 500-level HTTPS status codes outlined in [“HTTP status codes” below](#). The status code determines whether or not the Quantum Hub retries delivery of the result message

HTTP status codes

The following table lists the HTTP status codes that the Quantum Hub expects along with a description of the code and the action the Quantum Hub takes.

HTTP Status Codes	Description
200 OK	The request was fulfilled. The 200 response is required for successful requests. In addition to the 200 response, you must also send an HL7 ACK message indicating whether or not the result message was received successfully. The ACK message and codes are explained in “HL7 ACK message” on the next page .
400 Bad Request	The request could not be fulfilled because of incorrect syntax, or it was otherwise impossible to fulfill. The Quantum Hub does not try to redeliver the request.
401 Unauthorized	The request could not be fulfilled because of an invalid authorization header or incorrect credentials. The Quantum Hub does not try to redeliver the request.
403 Forbidden	The request is not allowed. The Quantum Hub does not try to redeliver the request.
404 Not Found	The server has not found anything matching the URL in the request. The Quantum Hub attempts to redeliver the request until the maximum number of retries is reached.
500 Internal Error	The server encountered an unexpected condition which prevented it from fulfilling the request. The Quantum Hub attempts to redeliver the request until the maximum number of retries is reached.
501 Not Implemented	The server does not support the request. The Quantum Hub attempts to redeliver the request until the maximum number of retries is reached.

HL7 ACK message

The ACK message that is returned to the Quantum Hub must contain the following HL7 segments:

- **MSH—Message Header segment.** The MSH segment defines the intent, source, destination, and syntax of an HL7 message. The MSH segment that is returned to the Quantum Hub must be constructed as follows:
 - The content of MSH.04 (*Sending Facility*) and MSH.06 (*Receiving Facility*) **must be reversed** from what was received in the original results message
 - The content of MSH.03 (*Sending Application*) and MSH.05 (*Receiving Application*) should also be reversed, but this is not required

Note: MSH.05 (*Receiving Application*) is not populated in the results message.

- MSH.12 (*Version ID*) is required and must contain the message HL7 version (2.3, 2.3.1, or 2.5.1) of the results message
- **MSA—Message Acknowledgment segment.** The MSA segment contains information pertinent to the acknowledgment of another HL7 message. The MSA segment that is returned to the Quantum Hub must be constructed as follows:
 - MSA.01 (*Acknowledgment Code*) must contain 1 of the HL7 acknowledgment codes to indicate the status of the received message. Valid acknowledgment codes are shown in [“Acknowledgment codes” below](#)
 - MSA.02 (*Message Control ID*) must contain the message control ID that is included in MSH.10 (*Message Control ID*) of the original results message. The message control ID is generated by the lab and identifies the message that is being acknowledged
 - MSA.03 (*Text Message*) is **strongly recommended** when a result is rejected. It should contain a text message that describes the reason for the rejection, which is useful for troubleshooting

Acknowledgment codes

While the Quantum Hub accepts all of the HL7 acknowledgment codes listed in the following table, it is recommended that you submit the “A” acknowledgment codes (AA, AE, and AR). Asynchronous responses are not supported.

Acknowledgment code	Description
AA	Application acknowledgment: Accept The HL7 result message is valid.
AE	Application acknowledgment: Error The HL7 result message is invalid due to erroneous dates or characters, missing fields or segments, invalid combination of MSH.04 (<i>Sending Facility</i>) and MSH.06 (<i>Receiving Facility</i>), etc. The Quantum Hub does not resend invalid HL7 messages.
AR	Application acknowledgment: Reject The HL7 message has been rejected due to system exceptions, such as a database or server being down.

Acknowledgment code	Description
	The Quantum Hub attempts to redeliver the result message until the maximum number of retries is reached.
CA	Application acknowledgment: Commit Accept The HL7 result message is valid.
CE	Application acknowledgment: Commit Error The HL7 result message is invalid due to erroneous dates or characters, missing fields or segments, invalid combination of MSH.04 (<i>Sending Facility</i>) and MSH.06 (<i>Receiving Facility</i>), etc. The Quantum Hub does not resend invalid HL7 messages.
CR	Application acknowledgment: Commit Reject The HL7 message has been rejected due to system exceptions, such as a database or server being down. The Quantum Hub attempts to redeliver the result message until the maximum number of retries is reached.

Sample ACK messages

The following sample ACK messages use the MSH.03, MSH.04, MSH.05, MSH.06, and MSH.10 values from the sample Basic Authentication request in [“Authentication requirements” on page 434](#).

The following is an example of a properly constructed ACK message for a result message that is being accepted:

```
MSH|^~\&||99931000|LAB|STL|202410151459||ACK|20241015151044065|P|2.3
MSA|AA|20241015151044065
```

The following is an example of a properly constructed ACK message for a result message that is being rejected:

```
MSH|^~\&||99931000|LAB|STL|202410151459||ACK|20241015151044065|P|2.3
MSA|AE|20241015151044065|Invalid date format
```

Sample lab results HL7 LRI 2.5.1 messages

The following are sample ORU^R01^ORU_R01—Observational Report—Unsolicited Observation Messages, formatted according to the “HL7 LRI 2.5.1 results message format requirements” on page 487 and “HL7 LRI 2.5.1 results segment specifications” on page 490.

Sample result message

```
MSH|^~\&|QLS|PH1^39D0657740^CLIA||78600001|20241209172707.000-0400||ORU^R01^ORU_
R01|800000000000000038102|P|2.5.1|1||AL|NE||||LRI_NG_RN_Pro-
file^^2.16.840.1.113883.9.20^ISO
PID|1||KP032061P^^^^LACSN||LastName^FirstName^^^^L||M|||^^^^USA
NTE|1|L|REPORT COMMENTS LINE 1
NTE|2|L|REPORT COMMENTS LINE 2
ORC|RE||KP032061P^QUEST_
PH1||CM|||||^LastName^FirstName|||||^78600001|Street
Address^^City^State^Zip^^O^^USA
OBR|1||KP032061P^QUEST_PH1|484^GLUCOSE, PLASMA^99QDI|||20241209010000.000-
0400|||||^
^LastName^FirstName|||||20240723163027.000-0400|||F
OBX|1|NM|25014500^GLUCOSE, PLASMA^99QDI^1558-6^Glucose p fast SerPl-
mCnc^LN|1|70|mg/dL^^99QDI
|65-99|N|||F|||20241209075253.000-0400|||20241209172707.000-0400|||QUEST
DIAGNOSTICS HORSHAM^^^^FI^CLIA^^39D0204404|900 BUSINESS CENTER
DRIVE^^HORSHAM^PA^19044-3432|1205872041
^LastName^FirstName^S^^^^^^NPI
NTE|1|L|
NTE|2|L| Fasting reference interval
NTE|3|L|
SPM|1|02^02||USPEC^Source, Unspecified^HL70487|||||20241209010000.000-0400
ORC|RE||KP032061P^QUEST_
PH1||CM|||||^LastName^FirstName|||||^78600001|Street
Address^^City^State^Zip^^O^^USA
OBR|2||KP032061P^QUEST_PH1|733^POTASSIUM^99QDI|||20241209010000.000-
0400|||||^LastName
^FirstName|||||20240723163027.000-0400|||F
OBX|1|NM|25000500^POTASSIUM^99QDI^2823-3^Potassium SerPl-sCnc^LN|1|4.5|m-
mol/L^^99QDI|3.5-5.3|N|||F|||20241209030000.000-0400|||20241209163027.000-
0400|||QUEST DIAGNOSTICS HORSHAM
^^^^FI^CLIA^^39D0204404|900 BUSINESS CENTER DRIVE^^HORSHAM^PA^19044-
3432|1205872041^LastName
^FirstName^S^^^^^^NPI
SPM|1|01^01||USPEC^Source, Unspecified^HL70487|||||20241209030000.000-0400
```

Sample result message with both a clinical and enhanced embedded PDF

```
MSH|^~\&|LAB|QAW^29D0652720^CLIA||90002|20241209172707.000-0100||ORU^R01^ORU_
R01|800000000000000117086|D|2.5.1|1||AL|NE||||LRI_NG_RN_Pro-
file^^2.16.840.1.113883.9.20^ISO
PID|1||123^^^^PT||TEST2.2.1^GOMA^^^^L||F|||||^123^4567890
```

```

ORC|RE|A41749098^Quest_QAW_90002|EXAMPLE5418435^QUEST_
QAW||CM|||||1194871186^LastName
^FirstName^^^^^^^^^NPI|||||TESTING ACCOUNT MU2 FOHA^^^^^^^^^90002|Street
Address^^City
^State^Zip^^O
OBR|1|A41749098^Quest_QAW_90002|EXAMPLE5418435^QUEST_QAW|110814^HPV HIGH RISK
CAPTURE, DNA^99QDI|||20241209010000.000-
0800|||||1194871186^LastName^FirstName^^^^^^^^^NPI|||||
20240122172707.000-0000|||F
OBX|1|ST|HPVHRT^HPV High Risk Capture^99QDI^30167-1^HPV I/H Risk 1 DNA Cervix Q1
bDNA^LN|1|
NEGATIVE||NEGATIVE|N|||F|||20241209075253.000-0700|||||20241209172707.000-
0000||||Quest
Diagnostics^^^^^^FI^CLIA^^29D0652720|4230 Burnham Ave.^^Las
Vegas^NV^89119|^LastName^FirstName
^MiddleName^^^^^^^^^01
NTE|1|L|Tested for High-Risk types
NTE|2|L|16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59,68.
NTE|3|L|The analytical performance characteristics
NTE|4|L|of this assay, when used to test SurePath
NTE|5|L|or Vaginal specimens, have been determined
NTE|6|L|by Quest Diagnostics.
NTE|7|L|Methodology: Hybrid Capture with Signal Amplification.
SPM|1||USPEC^Source, Unspecified^HL70487|||||20241209010000.000-
0800|20241205064636.000-0800
ORC|RE|A41749098^Quest_QAW_90002|EXAMPLE5418435^QUEST_
QAW||CM|||||1194871186^LastName
^FirstName^^^^^^^^^NPI|||||TESTING ACCOUNT MU2 FOHA^^^^^^^^^90002|Street
Address^^City
^State^Zip^^O
OBR|2|A41749098^Quest_QAW_90002|EXAMPLE5418435^QUEST_QAW|ClinicalPDFReport1^Clinical
PDF Report EXAMPLE5418435-1^99QDI|||20241205010000.000-
0800|||||1194871186^LastName^FirstName^^^^^^^^^
NPI|||||20240122172707.000-0000|||F
OBX|1|ED|ClinicalPDFReport1^Clinical PDF Report EXAMPLE5418435-
1^99QDI||QAW^IM^^Base64
^JVBERi0xLjMKJf///8KCjEgMCBvY-
moKPDwKL1BhZ2VMYXlvdXQgL1NpbmdsZVBhZ2UKL1BhZ2VNb2RlIC9Vc2VOB251
Ci9QYWdlcyAyIDAgUgov-
VHlwZSAvQ2F0YWxvZwo+PgplbmRvYmoKCjEgMCBvYmoKPDwKL0NvdW50IDEKLT0tpZHMgWyAzI
DAGUiBdCi9UeXB1IC9QYWdlcw. . . Base64 content truncated|||||F|||||Quest
Diagnostics^^^^^^FI
^CLIA^^29D0652720|4230 Burnham Ave.^^Las
Vegas^NV^89119|^LastName^FirstName^MiddleName
^^^^^^^^^01
ORC|RE|A41749098^Quest_QAW_90002|EXAMPLE5418435^QUEST_
QAW||CM|||||1194871186^LastName
^FirstName^^^^^^^^^NPI|||||TESTING ACCOUNT MU2 FOHA^^^^^^^^^90002|Street
Address^^City
^State^Zip^^O

```

OBR|3|A41749098^Quest_QAW_90002|EXAMPLE5418435^QUEST_QAW|EnhancedPDFReport2^Enhanced
PDF Report EXAMPLE5418435-2^99QDI|||20241205010000.000-
0800|||||1194871186^LastName^FirstName^^^^^^^^^^
NPI|||||20240122172707.000-0000|||F
OBX|1|ED|EnhancedPDFReport2^Enhanced PDF Report EXAMPLE5418435-
2^99QDI||QAW^IM^^Base64
^JVBERi0xLjMKJaqr-
rK0KNCAwIG9iago8PCAvVHlwZSAvSW5mbwovUHJvZHVjZXIIGK51bGwpID4+CmVuZG9iago2IDAq
b2JqCjw8IC9MZW5ndGg-
gMjA2NyAvRmlsdGVyIFsgIC9GbGF0ZURlY29kZSBdCiA+PgpzdHJlYW0KSkpwhWk87TnKdzxa+
fVaryzeArpEwn-
rLJnKoIgNO6sazWkkvEzW9WSn+ZfChBNzJv9fwxJo3qcSmjR7cY6MK5BXinmFn9RPoMEJ6Qk+vbGtWlx
9CRs5OGfyn6pBOIn/4uyMYzKBEf/. . . **Base64 content truncated**|||||F||||| Quest
Diagnostics^^^^^^
FI^CLIA^^29D0652720|4230 Burnham Ave.^^Las Vegas^NV^89119|
^LastName^FirstName^MiddleName
^^^^^^^^^^01

Chapter 15: Lab results HL7 2.3/2.3.1 specification

In this chapter:

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- Sample lab results HL7 2.3/2.3.1 messages 480

About the lab results HL7 2.3/2.3.1 specification

This chapter provides detailed format specifications for lab results that are sent from a Quest laboratory or business unit (BU) for EMRs to retrieve via the Lab Results web service or the Observation Results web service. Results may be formatted according to the *HL7 2.3 Specification* or the *HL7 2.3.1 Specification*, with any exceptions noted in this chapter.

Note: The tables shown in “[Lab results HL7 2.3/2.3.1 message segment specifications](#)” on page 445 contain both the HL7 2.3 and HL7 2.3.1 specifications.

In cases where these specifications are identical, only 1 specification is shown.

In cases where there are differences, both the HL7 2.3 and HL7 2.3.1 specifications are shown in order to highlight these differences.

Supported messages for results are ORU^R01—Observational Report—Unsolicited Message.

This chapter includes the following sections:

- **Result message format requirements.** For information on the message format requirements, see “[Lab results HL7 2.3/2.3.1 message format requirements](#)” on the next page
- **Result message segment specifications.** Each result message contains a number of standard sections. For requirements on the standard segments of a result message, see “[Lab results HL7 2.3/2.3.1 message segment specifications](#)” on page 445
- **Sample Result messages.** For samples of the various result messages, see “[Sample lab results HL7 2.3/2.3.1 messages](#)” on page 480

Lab results HL7 2.3/2.3.1 message format requirements

In addition to the field-level validation detailed in “[Lab results HL7 2.3/2.3.1 message segment specifications](#)” on page 445, each Observational Report—Unsolicited (ORU) message from a Quest laboratory or business unit (BU) adheres to the rules outlined in this section.

Note: For a detailed specification of lab orders that are sent to the Quantum Hub for processing, see [Chapter 6, “Order HL7 2.3 specification”](#) beginning on page 101.

Message segment hierarchy

ORU messages must follow the message segment hierarchy, as specified below:

MSH	Message Header
PID	Patient Identification
{ [NTE] }	Notes and Comments
ORC	Common Order
{	
OBR	Observation Request
{ [
OBX	Observation Result
{ [NTE] }	Notes and Comments
] }	
}	
[{	Added for embedded PDF (Optional)
OBR	Added for embedded PDF (Optional—One per PDF document)
OBX	Added for embedded PDF (Optional—One per PDF document, contains document file)
}]	

In the hierarchy shown above, braces ({ }) indicate where multiple items are allowed, and brackets ([]) indicate items that are optional. For information on the embedded PDF segments, see “[Embedded PDF segments](#)” on page 478.

Newline characters

Result HL7 messages must use the carriage return (CR) character (ASCII 0x0D) to indicate a segment delimiter. Result messages that contain a line feed (LF) character (ASCII 0x0A) to indicate a segment delimiter will be rejected.

Field delimiters

A delimiter must separate each field. Even if a field contains no data, it must still be delimited. The delimiter for any given HL7 message is always defined in the MSH segment of the message, as the first character following the segment identifier (MSH.00). See “[Lab results HL7 2.3/2.3.1 message segment specifications](#)” on page 445 for more detail. Standard HL7 delimiters are used.

Field specifications

The following table describes the parameters used to define the data fields within each message segment.

Parameter	Description
Required	<p>The fields within each segment are classified based on their support status of Always (A), Conditional (C), Not Supported (X), or Pass Through (PT) as defined below:</p> <ul style="list-style-type: none">• Always. If the corresponding segment is present, the field will also be present within the segment• Conditional. The field may or may not be present, depending on certain conditions (stipulated in the <i>Comments</i> column of each segment table)• Pass Through. The information in the field is passed through from the original inbound order (ORM or OML) message• Not Supported. The field is not supported in this message and thus no value is returned. The corresponding field appears in <i>gray text</i> in the segment tables
Type	An HL7 standard data type as defined in the <i>HL7 2.3 or 2.3.1 Specification</i> .
Length	The maximum allowed length for the field.
Repeat	<p>Each field is classified with 1 of the following values:</p> <ul style="list-style-type: none">• N: May not repeat• Y: May repeat any number of times• Y/n: May repeat up to <i>n</i> times

Lab results HL7 2.3/2.3.1 message segment specifications

This section provides detailed specifications for each segment of an HL7 lab result message. Message segments include the following:

- “MSH—Message Header segment” below
- “PID—Patient Identifier segment” on page 447
- “ORC—Common Order segment” on page 454
- “OBR—Observation Request segment” on page 457
- “OBX—Observation/Result segment” on page 470
- “NTE—Notes and Comments segment” on page 477

Note: The tables shown below contain both the HL7 2.3 and HL7 2.3.1 specifications. In cases where these specifications are identical, only 1 specification is shown. In cases where there are differences, both the HL7 2.3 and HL7 2.3.1 specification are shown in order to highlight these differences.

MSH—Message Header segment

The Message Header (MSH) segment defines the intent, source, destination, and some specifics of the syntax of a message.

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.00	Segment Type ID	A	ST	4	N	This is MSH.
MSH.01	Field Separator	A	ST	1	N	The separator between the message segment ID (MSH) and the first data field (MSH.02), which defines the character to be used as a separator for the rest of the message. This is always a vertical bar ().
MSH.02	Encoding Characters	A	ST	4	N	The following characters may be used: <ul style="list-style-type: none">• ^ (component separator)• ~ (repetition separator)• \ (escape character)• & (sub-component separator) These values are recommended by HL7, and are the only values used in the lab result messages.

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.03	Sending Application	A	EI	180	N	This field is populated with LAB.
03.01	Namespace ID	O	IS			
03.02	Universal ID	O	ST			
03.03	Universal ID Type	O	ID			
MSH.04	Sending Facility	A	EI	180	N	The 3- or 4-letter ID of the facility where the test was performed. Note: While HL7 allows for a length of 180, this is currently populated only with the 3-letter ID.
04.01	Namespace ID	O	IS			
04.02	Universal ID	O	ST			
04.03	Universal ID Type	O	ID			
MSH.05	Receiving Application	X				
MSH.06	Receiving Facility	A	EI	180	N	The receiving facility. The account number defined for the placer (same as MSH.04 in the ORM or OML).
06.01	Namespace ID	O	IS			
06.02	Universal ID	O	ST			
06.03	Universal ID Type	O	ID			
MSH.07	Date/Time of Message	A	TS	14	N	The date and time that the sending system created the message, formatted as: YYYYMMDDHHMMSS
MSH.08	Security	X				
MSH.09	Message Type	A	CM	7	N	The type of message being transmitted, and the event leading to the creation of the message. This field is populated with ORU^R01 (<i>Results Messages</i>).
09.01	Message Type	R	ID			This is ORU.

Field	Name	Req'd	Type	Length	Repeat	Comments
09.02	Trigger Event	R	ID			This is R01.
MSH.10	Message Control ID	A	ST	20	N	A unique, 20-digit number that is generated by the Quantum Hub.
MSH.11	Processing ID	A	PT	3	N	This indicates whether this message is intended to be processed as a production, test, or debug message.
11.01	Processing ID	R	ID			Valid values are: <ul style="list-style-type: none"> • P: Production • T: Training • D: Debug (Development) Live messages are populated with P.
11.02	Processing Mode	O	ID			
MSH.12	Version ID	A	ID	8	N	This is the HL7 version. Possible values are: <ul style="list-style-type: none"> • 2.3 • 2.3.1
MSH.13	Sequence Number	X				
MSH.14	Continuation Pointer	X				
MSH.15	Accept Acknowledgment Type	X				
MSH.16	Application Acknowledgment Type	X				
MSH.17	Country Code	X				
MSH.18	Character Set	X				
MSH.19	Principal Language of Message	X				

PID—Patient Identifier segment

The Patient Identifier (PID) segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.00	Segment Type ID	A	ST	4	N	This is PID.
PID.01	Set ID	C	SI	4	N	This allows identification of multiple PID segments within a message, and is usually a sequential number beginning with 1.
PID.02	Patient ID (External ID)	A	CX	20	N	The placer's patient ID assigned to this order.
02.01	ID Number	O	ST			
02.02	Check Digit	O	ST			
02.03	Code Identifying the Check Digit Scheme Employed	O	ID			
02.04	Assigning Authority	O	HD			
02.04.01	Namespace ID	O	IS			
02.04.02	Universal ID	O	ST			
02.04.03	Universal ID Type	O	ID			
02.05	Identifier Type Code	O	ID			
02.06	Assigning Facility	O	HD			
02.06.01	Namespace ID	O	IS			
02.06.02	Universal ID	O	ST			
02.06.03	Universal ID Type	O	ID			
PID.03	Patient ID (Internal ID)	C	CX	250	Y	This is a repeating field and has a maximum length of 250 characters for each repeat of data.
03.01	ID Number	R	ST			This is the ID number defined by the <i>Assigning Authority</i> .
03.02	Check Digit	O	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.03	Code Identifying the Check Digit Scheme Employed	0	ID			
03.04	Assigning Authority	0	HD			<p>The valid values for the <i>Assigning Authority</i> are:</p> <ul style="list-style-type: none"> • MRN: Medical Record Number • CID: Chart ID • QDPNUM: Quest Health ID • ACCN: Accession Number <p>If no <i>Assigning Authority</i> is present, the ID Number is assumed to be an accession number.</p>
03.04.01	Namespace ID	0	IS			
03.04.02	Universal ID	0	ST			
03.04.03	Universal ID Type	0	ID			
03.05	Identifier Type Code	0	ID			
03.06	Assigning Facility	0	HD			
03.06.01	Namespace ID	0	IS			
03.06.02	Universal ID	0	ST			
03.06.03	Universal ID Type	0	ID			
03.07	Effective Date	0	DT			
03.08	Expiration Date	0	DT			
03.09	Assigning Jurisdiction	0	CWE			
03.09.01	Identifier	0	ST			
03.09.02	Text	0	ST			
03.09.03	Name of Coding System	0	ID			
03.09.04	Alternate Identifier	0	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.09.05	Alternate Text	0	ST			
03.09.06	Name of Alternate Coding System	0	ID			
03.09.07	Coding System Version ID	0	ST			
03.09.08	Alternate Coding System Version ID	0	ST			
03.09.09	Original Text	0	ST			
03.10	Assigning Agency or Department	0	CWE			
03.10.01	Identifier	0	ST			
03.10.02	Text	0	ST			
03.10.03	Name of Coding System	0	ID			
03.10.04	Alternate Identifier	0	ST			
03.10.05	Alternate Text	0	ST			
03.10.06	Name of Alternate Coding System	0	ID			
03.10.07	Coding System Version ID	0	ST			
03.10.08	Alternate Coding System Version ID	0	ST			
03.10.09	Original Text	0	ST			
PID.04	Alternate Patient ID	PT	CX	20	Y	This is the lab reference number, which is the same as ORC.02 and OBR.02 .

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.05	Patient Name	A	XPN	24	Y	This must be no more than 24 characters, excluding any delimiters (for example, between the last and the first name). This must include at least 1 character for the first and last name.
05.01	Family Name	R	ST			
05.02	Given Name	R	ST			
05.03	Middle Initial or Name	O	ST			
05.04	Suffix	O	ST			
05.05	Prefix	O	ST			
05.06	Degree	O	IS			
05.07	Name Type Code	O	ID			
05.08	Name Representation Code	O	ID			
PID.06	Mother's Maiden Name	X				
PID.07	Date of Birth	A	TS	26	N	This field is the date of birth (DOB), formatted as: yyyymmdd
PID.08	Sex	A	IS	1	N	The valid values for this field are: <ul style="list-style-type: none"> • M: Male • F: Female
PID.09	Patient Alias	X				
PID.10	Race	O	IS	1	N 2.3 Y 2.3.1	
PID.11	Patient Address	C	XAD	106	Y	This field is the patient's address, formatted as: 1000 Parkway Drive^Apt. 4^ Mason^OH^45040^^^^^
11.01	Street Address	O	ST			
11.02	Other Designation	O	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
11.03	City	0	ST			
11.04	State or Province	0	ST			
11.05	Zip or Postal Code	0	ST			
11.06	Country	0	ID			
11.07	Address Type	0	ID			
11.08	Other Geographic Designation	0	ST			
11.09	County or Parish Code	0	IS			
11.10	Census Tract	0	IS			
PID.12	County Code	X				
PID.13	Phone Number - Home	C	XTN	250	Y	<p>This field uses data type 250 XTN and is sub-delimited in subfields 6 and 7 (area code and phone number, respectively).</p> <p>For backward compatibility, phone numbers sent in the 10-digit format (for example, 3148721727) or any of the following variations for sending data in the XTN data format will also be accepted:</p> <p> 3148727127^^^^^^^ </p> <p> 3148727127^^^^^314^8727127^ ^ </p> <p>or</p> <p> ^^^^^314^8727127^^ </p> <p>or</p> <p> 3148727127 </p>
13.01	Phone Number String	0	ST			
13.02	Tele-communication Use Code	0	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
13.03	Tele-communication Equipment Type	0	ID			
13.04	Email Address	0	ST			
13.05	Country Code	0	NM			
13.06	Area or City Code	0	NM			
13.07	Phone Number	0	NM			
13.08	Extension	0	NM			
13.09	Any Text	0	ST			
PID.14	Phone Number - Business	X				
PID.15	Language - Patient	X				
PID.16	Marital Status	X				
PID.17	Religion	X				
PID.18	Patient Account Number	X				
PID.19	SSN Number - Patient	C	ST	9	N	This is populated if the SSN was provided in the order. If populated, it contains 9 digits (numeric only; no spaces or punctuation).
PID.20	Driver's Lic Num - Patient	X				
PID.21	Mother's Identifier	X				
PID.22	Ethnic Group	0	IS	3	N 2.3 Y 2.3.1	
PID.23	Birth Place	X				
PID.24	Multiple Birth Indicator	X				
PID.25	Birth Order	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.26	Citizenship	X				
PID.27	Veterans Military Status	X				
PID.28	Nationality	X				
PID.29	Patient Death Date & Time	X				
PID.30	Patient Death Indicator	X				

ORC—Common Order segment

The Common Order (ORC) segment is used to transmit fields that are common to all orders (all types of services that are requested).

Field	Name	Req'd	Type	Length	Repeat	Comments
ORC.00	Segment Type ID	A	ST	4	N	This field must be <code>ORC</code> .
ORC.01	Order Control	A	ID	2	N	The value for this field is <code>RE</code> (Results).
ORC.02	Placer Order Number	PT	EI	20	N	This field contains the placer application's order number and is the same as <code>OBR.02</code> . This value is passed through from the inbound order, to the LIS, to the result.
02.01	Entity Identifier	PT	ST			
02.02	Namespace ID	PT	IS			
02.03	Universal ID	PT	ST			
02.04	Universal ID Type	PT	ID			
ORC.03	Filler Order Number	A	EI	22	N	The lab accession number, populated by the LIS after receipt of the order. The lab accession numbers are reused and are not unique. Thus, ORC.03 should not be used for order-result matching.
03.01	Entity Identifier	A	ST			
03.02	Namespace ID	O	IS			

Field	Name	Req'd	Type	Length	Repeat	Comments
03.03	Universal ID	O	ST			
03.04	Universal ID Type	O	ID			
ORC.04	Placer Group Number	X				
ORC.05	Order Status	A	ID	2	N	<p>This indicates whether the result is partial or final.</p> <p>Valid values for this field are:</p> <ul style="list-style-type: none"> • CM: Order complete • IP: Order incomplete, or contains pending items
ORC.06	Response Flag	X				
ORC.07	Quantity/Timing	X				
ORC.08	Parent	X				
ORC.09	Date/Time of Transaction	X				
ORC.10	Entered By	X				
ORC.11	Verify By	X				
ORC.12	Ordering Provider	C	XCN	120	Y	<p>This identifies the provider that ordered the test. If present in the inbound order, the result echoes this value.</p> <p>Note: ORC.12 equals OBR.16.</p> <p>For version 2.3:</p> <p>This field is formatted for NPI as follows:</p> <pre>NPI_number^Lastname^ Firstname^Middle ^^^^^NPI</pre> <p>For example:</p> <pre>ORC RE 0001 SL123456A CM 1234567893^LASTNAME^ FIRSTNAME^^^^^^NPI </pre> <p>For version 2.3.1:</p> <p>The literal NPI is moved from subfield 9 to subfield 13.</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
						<p>This field is formatted as follows:</p> <pre>NPI_number^Lastname^ Firstname^Middle ^^^^^^^^^^NPI</pre> <p>For example:</p> <pre>ORC RE 0001 SL123456A CM 1234567893^LASTNAME^ FIRSTNAME^^^^^^^^^^ NPI </pre>
12.01	ID Number	C	ST			
12.02	Family Name	C	ST			
12.03	Given Name	C	ST			
12.04	Middle Initial or Name	C	ST			
12.05	Suffix	X				
12.06	Prefix	X				
12.07	Degree	X				
12.08	Source Table	X				
12.09	Assigning Authority	C	HD			This is used in version 2.3 only.
12.09.01	Namespace ID	X				
12.09.02	Universal ID	X				
12.09.03	Universal ID Type	X				
12.10	Name Type Code	X				
12.11	Identifier Check Digit	X				
12.12	Code Identifying the Check Digit Scheme Employed	X				
12.13	Identifier Type Code	C	IS			This is used in version 2.3.1 only.
12.14	Assigning Facility	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
12.14.01	Namespace ID	X				
12.14.02	Universal ID	X				
12.14.03	Universal ID Type	X				
ORC.13	Enterer's Location	X				
ORC.14	Call Back Phone Number	X				
ORC.15	Order Effective Date/Time	X				
ORC.16	Order Control Code Reason	O	CE	200	N	
16.01	Identifier	O	ST			
16.02	Text	O	ST			
16.03	Name of Coding System	O	ST			
16.04	Alternate Identifier	O	ST			
16.05	Alternate Text	O	ST			
16.06	Name of Alternate Coding System	O	ST			
ORC.17	Entering Organization	X				
ORC.18	Entering Device	X				
ORC.19	Action By	X				

OBR—Observation Request segment

One OBR segment must be transmitted for each Order Code associated with any PID segment. This segment is **mandatory** in ORU messages.

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.00	Segment Type ID	A	ST	4	N	This must be OBR.
OBR.01	Set ID	A	SI	4	N	OBR segments grouped under a PID are numbered sequentially, beginning with 1.

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.02	Placer Order Number	PT	EI	22	N	<p>The placer application's order number. This is the same as the value in ORM or OML.</p> <p>If different values are present in the ORM or OML in ORC.02 and OBR.02, then all values are rolled into a single value.</p>
02.01	Entity Identifier	PT	ST			
02.02	Namespace ID	PT	IS			
02.03	Universal ID	PT	ST			
02.04	Universal ID Type	PT	ID			
OBR.03	Filler Order Number	A	EI	22	N	<p>The order number (also called the lab accession number) associated with the filler's application; this is the same as ORC.03.</p> <p>Note: Lab accession numbers are reused and are not unique. Thus, OBR.03 should not be used for order-result matching.</p>
03.01	Entity Identifier	A	ST			
03.02	Namespace ID	X				
03.03	Universal ID	X				
03.04	Universal ID Type	X				
OBR.04	Universal Service ID	A	CE	200	N	<p>This is the identification code for the ordered test. Only 1 order code can be submitted per OBR segment.</p> <p>For version 2.3:</p> <p>This field is formatted as follows:</p> <pre>local_order_ code^description ^^local_order_ code^description</pre> <p>For version 2.3.1:</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
						<p>In this version, OBR 04.01 includes the order code without a suffix. Suffix codes will be retained (if sent) in OBR 04.04.</p> <p>For example:</p> <pre> 7600^LIPID PROFILE^^7600SB= ^LIPID PANEL </pre> <p>Note: Content other than noted above might appear in these fields if NMS Mapping (Nomenclature Mapping System)/Translation Services Mapping) has been imposed.</p> <p>Some lab systems add a suffix to the lab order code in the result messages (eg, 10165SB=, where SB= is added by the lab system).</p> <p>The order code part of the field will always be present, but the description may or may not be included.</p> <p>For the OBR and OBX segments supplied for embedded PDFs, OBR.04 is populated as shown in the following rows for the subfields.</p>
04.01	Identifier					<p>This is the report label.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> For the clinical (standard) report: ClinicalPDFReport# For the enhanced report: EnhancedPDFReport# where # is the PDF sequence number <p>For example:</p> <pre>ClinicalPDFReport1</pre>
04.02	Text					<p>This is the report description.</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
						<p>Valid values are:</p> <ul style="list-style-type: none"> For the clinical (standard) report: Clinical PDF Report accession_number-# For the enhanced report: Enhanced PDF Report accession_number-# where accession_number is the value from 04.02 and # is the PDF sequence number <p>For example: Clinical PDF Report CB016454A-1</p>
04.03	Coding System Name					This is left blank.
04.04	Alternate Identifier					<p>This is the report label.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> For the clinical (standard) report: ClinicalPDFReport# For the enhanced report: EnhancedPDFReport# where # is the PDF sequence number <p>For example: ClinicalPDFReport1</p>
04.05	Alternate Text					<p>This is the report description.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> For the clinical (standard) report: Clinical PDF Report accession_number-# For the enhanced report: Enhanced PDF Report accession_number-#

Field	Name	Req'd	Type	Length	Repeat	Comments
						<p>where accession_number is the value from 04.02 and # is the PDF sequence number</p> <p>For example:</p> <p>Clinical PDF Report CB016454A-1</p>
OBR.05	Priority (OBR.27)	X				
OBR.06	Requested Date/Time	X				
OBR.07	Observation Date/Time	PT	TS	26	N	<p>This is the specimen collection date and time. If present in the inbound order, the result echoes this value. This field is formatted as follows:</p> <p>yyyymmddhhmmss</p> <p>Seconds are always 00.</p>
OBR.08	Observation End Date/Time	X				
OBR.09	Collection Volume	X				
OBR.10	Collector Identifier	X				
OBR.11	Specimen Action Code	C	ID	1	N	<p>This field is not supported for version 2.3.</p> <p>For version 2.3.1 only:</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • G: the test was reflexed • A: the test is an add-on • blank
OBR.12	Danger Code	X				
OBR.13	Relevant Clinical Info.	X				
OBR.14	Specimen Received Date/Time	A	TS	26	N	<p>For observations requiring a specimen, this is the actual login time at the diagnostic service.</p> <p>This field must contain a date and time, formatted as follows:</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
						<p>yyyymmddhhmmss</p> <p>The time is in 24-hour format, and valid hours are from 0–23, with 0 being 12:00 AM and 12 being 12:00 PM. Seconds are always 00.</p> <p>For example, April 13, 2024 at 4:30 PM would be formatted as:</p> <p>20240413163000</p>
OBR.15	Specimen Source	X				
OBR.16	Ordering Provider	C	XCN	120	Y	<p>This field identifies the provider who ordered the test. If present in the inbound order, the result echoes this value.</p> <p>Note: OBR.16 equals ORC.12.</p> <p>For version 2.3:</p> <p>The format for NPI is as follows:</p> <p>NPI_number^Lastname^ Firstname^Middle^^^^NPI</p> <p>For example:</p> <p>ORC RE 0001 SL123456A CM 1234567893 ^LASTNAME^FIRSTNAME ^^^^^NPI </p> <p>For version 2.3.1:</p> <p>The literal NPI was moved from its position in subfield 9 to subfield 13.</p> <p>The format for NPI is as follows:</p> <p>NPI_ number^Lastname^Firstname^ Middle^^^^^^^^NPI</p> <p>For example:</p> <p>ORC RE 0001 SL123456A CM 1234567893^ LASTNAME^FIRSTNAME ^^^^^^^^^^NPI </p>

Field	Name	Req'd	Type	Length	Repeat	Comments
16.01	ID Number	0	ST			
16.02	Family Name	0	ST			
16.03	Given Name	0	ST			
16.04	Middle Initial or Name	0	ST			
16.05	Suffix	X				
16.06	Prefix	X				
16.07	Degree	X				
16.08	Source Table	X				
16.09	Assigning Authority	0	HD			This is used in version 2.3 only.
16.09.01	Namespace ID	X				
16.09.02	Universal ID	X				
16.09.03	Universal ID Type	X				
16.10	Name Type Code	X				
16.11	Identifier Check Digit	X				
16.12	Code Identifying the Check Digit Scheme Employed	X				
16.13	Identifier Type Code	0	IS			This is used in version 2.3.1 only.
16.14	Assigning Facility	X				
16.14.01	Namespace ID	X				
16.14.02	Universal ID	X				
16.14.03	Universal ID Type	X				
OBR.17	Order Callback Phone Number	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.18	Placer field 1	PT	ST	60	N	This is used as a “store and forward” field, and is not supported for results-only interfaces.
OBR.19	Placer field 2	PT	ST	60	N	This is used as a “store and forward” field, and is not supported for results-only interfaces.
OBR.20	Filler Field 1	C	ST	60	N	<p>This is the component code (for profiles only). This includes the component order code in subfield 4, and the component order name in subfield 5.</p> <p>For version 2.3:</p> <p>This field is formatted as follows:</p> <pre>Component Code (without suffix) ^Description ^^Component Code (with suffix if sent) ^Description</pre> <p>For version 2.3.1:</p> <p>Some lab systems add a suffix to the component code in the result message, eg, 10165SB=, where SB= is added by the lab system.</p> <p>For example:</p> <pre> 896 ^TRIGLICERIDES ^^ 896SB= ^TRIGLYCERIDES </pre> <p>Note: Content other than noted above might appear in these fields if NMS Mapping (Nomenclature Mapping System)/Translation Services Mapping) has been imposed.</p>
OBR.21	Filler Field 2	A	ST	400	Y	<p>OBR.21 is a repeating field and is defined as a maximum length of 400 characters for each repeat of data.</p> <p>This field is populated with the Site ID, formatted as follows:</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
						SiteID^Lab Name^Lab Address^City^State^Zip^Medical Director
21.01	SiteID	0	NM			
21.02	Lab Name	0	ST			
21.03	Lab Address	0	ST			
21.04	City	0	ST			
21.05	State	0	ST			
21.06	Zip	0	ST			
21.07	Medical Director	0	ST			This is formatted as follows: Lastname^Firstname^Middle
OBR.22	Results Rpt/ Status Chng - Date/Time	A	TS	26	N	The date and time that the observation was reported. This communicates when the result file was created in the lab system, formatted as follows: yyyymmddhhmmss Seconds are always 00.
OBR.23	Charge to Practice	X				
OBR.24	Diagnostic Serv Sect ID	C	ID	10	N	For version 2.3.1 only: Values include, but are not limited to: <ul style="list-style-type: none"> • PGX • MC • MS • AP • The AL sequences (for example, AL1A) • UX

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.25	Result Status	A ^a	ID	1	N	<p>Valid values for this field include:</p> <p>For version 2.3:</p> <ul style="list-style-type: none"> • C: Correction to results • F: Final results • P: Preliminary results • X: Test canceled <p>For version 2.3.1:</p> <p>Typical values for this field include:</p> <ul style="list-style-type: none"> • P: Preliminary results • I: Pending results <p>Other values supported are:</p> <ul style="list-style-type: none"> • C: Correction to results • F: Final results • P: Preliminary • X: Test canceled <p>Data is also passed in OBX.11 (<i>Observ Result Status</i>).</p> <p>Note: A status of X indicates that all observations for the test identified have been canceled.</p>
OBR.26	Parent Result	C	CM	400	N	<p>For version 2.3.1 only:</p> <p>This contains the order code that caused a reflex test to be performed.</p>
26.01	OBX.03 Observation Identifier of Parent Result		CE			

^aCheck the status of each OBR in the HL7 file in this order of priority:

1. If any are a C then the PDF report would be a C (*Corrected*).
2. If any are a P and none are a C, then the PDF report would be a P (*Preliminary*).
3. If any are an I and none are a C or a P, then the PDF report would be an I (*Partial*).
4. If all are an F or a combination of F and X, then the PDF report would be an F (*Final*).
5. If all are an X then the PDF report would be an X (*Canceled*).

Field	Name	Req'd	Type	Length	Repeat	Comments
26.01.01	Identifier	0	ST			
26.01.02	Text	0	ST			
26.01.03	Name of Coding System	0	ID			
26.01.04	Alternate Identifier	0	ST			
26.01.05	Alternate Text	0	ST			
26.01.06	Name of Alternate Coding System	0	ID			
26.02	OBX.04 Sub ID of Parent Result		ST			
26.03	OBX.05 Observation Results from Parent		TX			
OBR.27	Quantity/Timing	X				
OBR.28	Result Copies To	0	XCN	150	Y/5	
28.01	ID Number	0	ST			
28.02	Family Name	0	ST			
28.03	Given Name	0	ST			
28.04	Middle Initial or Name	0	ST			
28.05	Suffix	0	ST			
28.06	Prefix	0	ST			
28.07	Degree	0	IS			
28.08	Source Table	0	ST			
28.09	Assigning Authority	0	HD			
28.09.01	Namespace ID	0	IS			
28.09.02	Universal ID	0	ST			
28.09.03	Universal ID Type	0	ID			
28.10	Name Type Code	0	ID			

Field	Name	Req'd	Type	Length	Repeat	Comments
28.11	Identifier Check Digit	0	ST			
28.12	Code Identifying the Check Digit Scheme Employed	0	ID			
28.13	Identifier Type Code	0	IS			
28.14	Assigning Facility	0	HD			
28.14.01	Namespace ID	0	IS			
28.14.02	Universal ID	0	ST			
28.14.03	Universal ID Type	0	ID			
OBR.29	Parent	X				
OBR.30	Transportation Mode	X				
OBR.31	Reason for Study	X				
OBR.32	Principal Result Interpreter	X				
OBR.33	Assistant Result Interpreter	X				
OBR.34	Technician	X				
OBR.35	Transcriptionist	X				
OBR.36	Scheduled Date/Time	X				
OBR.37	Number of Sample Containers	X				
OBR.38	Transport Logistics of Collected Sample	X				
OBR.39	Collector's Comment	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.40	Transport Arrangement Responsibility	X				
OBR.41	Transport Arranged	X				
OBR.42	Escort Required	X				
OBR.43	Planned Patient Transport Comment	X				
OBR.44	Procedure Code	X				
OBR.45	Procedure Code Modifier	X				
OBR.46	Placer Supplemental Service Information	X				
OBR.47	Filler Supplemental Service Information	X				
OBR.48	Medically Necessary Duplicate Procedure Reason	X				
OBR.49	Result Handling	O	IS	2	N	<p>This field indicates whether or not an associated Interactive Insights report is available.</p> <p>Valid values for this field are:</p> <ul style="list-style-type: none"> • II: A report is available • blank: No report is available <p>Note: If there are multiple OBR segments in the results message, only the value in the first OBR segment is used.</p>

OBX—Observation/Result segment

This segment is optional. The OBX segment is used to transmit a single observation or observation fragment. It represents the smallest indivisible unit of a report.

Field	Name	Req'd	Type	Length	Repeat	Comments
OBX.00	Segment Type ID	A	ST	10	N	This must be OBX.
OBX.01	Set ID	A	SI	10	N	<p>This is the sequence number for OBX segments grouped beneath the same OBR segment.</p> <p>For OBR segments that contain discrete results, there can be multiple OBX segments per OBR.</p> <p>For OBR segments that contain embedded PDFs, there is only 1 OBX per OBR.</p>
OBX.02	Value Type	A	ID	2	N	<p>This field defines the structure of the observation value (OBX.05).</p> <p>Valid values are:</p> <ul style="list-style-type: none">• ST: String data• NM: Numeric data• CE: Coding element• TX: Text data• ED: Embedded data, such as PDFs <p>Note: When a PDF is embedded in an OBX segment, the value for OBX.02 is ED. The OBX segments that contain embedded PDFs are paired with OBR segments and appear at the end of the HL7 message.</p>
OBX.03	Observation Identifier	A	CE	590	N	<p>For discrete results, this contains the analyte number, analyte name, and coding system, formatted as follows:</p> <ul style="list-style-type: none">• OBX 03.01 = LOINC code• OBX 03.02 = LOINC code name/description

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> • OBX 03.03 = LN • OBX 03.04 = Local code • OBX 03.05 = Local code name/description • OBX 03.06 = Pass through <p>The local code (OBX 03.04) is always present, but all other subfields are optional.</p> <p>If the <i>Disable LOINC</i> option is selected for the Hub account, or if it is not selected and OBX 03.01 matches OBX 03.04, the Quantum Hub passes all subfields through.</p> <p>If it is not selected and 03.01 does not equal 03.04, the Quantum Hub does the following:</p> <ul style="list-style-type: none"> • Set 03.01 to the value of 03.04 • Set 03.02 to the value of 03.05 • Set 03.03 to blank • Pass 03.04, 03.05, and 03.06 through unchanged <p>For embedded PDF results, OBX.03 is populated as documented in the subfields in the following rows.</p>
03.01	Universal Service Identifier/Identifier					<p>This is the report label.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • For the clinical (standard) report: ClinicalPDFReport# • For the enhanced report: EnhancedPDFReport# where # is the PDF sequence number <p>For example: ClinicalPDFReport1</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
03.02	Universal Service Identifier/Text					<p>This is the report description.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> For the clinical (standard) report: Clinical PDF Report accession_number-# For the enhanced report: Enhanced PDF Report accession_number-# where accession_number is the value from OBR.03 and # is the PDF sequence number. <p>Example:</p> <p>Clinical PDF Report CB016454A-1</p>
03.03	Coding System Name					This field is empty.
03.04	Universal Service Identifier/Alternate Identifier					<p>This is the report label.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> For the clinical (standard) report: ClinicalPDFReport# For the enhanced report: EnhancedPDFReport# where # is the PDF sequence number
03.05	Universal Service Identifier/Alternate Text					<p>This is the report description.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> For the clinical (standard) report: Clinical PDF Report accession_number-# For the enhanced report: Enhanced PDF Report accession_number-#

Field	Name	Req'd	Type	Length	Repeat	Comments
						where accession_number is the value from OBR.03 and # is the PDF sequence number.
OBX.04	Observation Sub-ID	O	ST	20	N	For version 2.3.1 only: A sequence number indicating how many times an OBX segment with the same OBX 03.01 (Universal Service Identifier/Identifier) appears under the OBR segment.
OBX.05	Observation Value	A	ID	Unlimited	Y	For embedded PDFs, the subfields are populated as outlined in OBX 05.01 through OBX.05.05 . OBX segments with embedded PDFs are paired with OBR segments and appear at the end of the result message. Result PDFs are encoded in Base64. For information on decoding the PDF, see “Decoding Base64 PDFs” on page 479 .
05.01	Application ID					This is the MSH.04 field for the sending facility (the 3-character code for a Quest lab).
05.02	Object Type					This is <code>Image</code> .
05.03	Format					This is <code>PDF</code> .
05.04	Encoding Type					This is <code>Base64</code> .
05.05	Observation Value					This is the encoded PDF file. For information on decoding the PDF, see “Decoding Base64 PDFs” on page 479 .
OBX.06	Units	C	CE	15	N	These are the units of measure in which the result is reported.
06.01	Identifier	O	ST			
06.02	Text	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
06.03	Name of Coding System	X				
06.04	Alternate Identifier	X				
06.05	Alternate Text	X				
06.06	Name of Alternate Coding System	X				
OBX.07	References Range	C	ST	24	N	<p>This is the range in which a reported result would be considered normal for the age and sex of the patient. This may be expressed as a numeric value, such as:</p> <ul style="list-style-type: none"> • Range 3.5–4.5 • Lower Limit > 10 • Upper Limit < 15 <p>This may also be expressed as an alpha value, such as:</p> <ul style="list-style-type: none"> • Negative • Non-reactive
OBX.08	Abnormal Flags	C	ID	5	Y/5	<p>This contains the normalcy status of the result being reported.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • L: Below low normal • LL: Below lower panic limits • H: Above high normal • HH: Above upper panic limits • A: Alpha abnormal • AA: Alpha very abnormal • N: Normal • Blank: No comment
OBX.09	Probability	X				
OBX.10	Nature of Abnormal Test	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBX.11	Observ Result Status	A ^a	ID	1	N	<p>This is the status of the result. Valid values are:</p> <p>For version 2.3:</p> <ul style="list-style-type: none"> • F: Final • P: Preliminary • C: Correction to a previously reported final result • X: Result cannot be obtained <p>For version 2.3.1:</p> <ul style="list-style-type: none"> • P: Preliminary results • I: Pending results <p>Other values supported:</p> <ul style="list-style-type: none"> • C: Correction to results • F: Final results • P: Preliminary • X: Test canceled <p>This data is also passed in OBR.25 (Result Status).</p>
OBX.12	Date Last Obs Normal Values	X				
OBX.13	User Defined Access Checks	X				
OBX.14	Date/Time of the Observation	C	TS	26	N	<p>The date and time that the observation was reported, formatted as:</p> <p>yyyymmddhhmmss</p> <p>Seconds are always 00.</p>

^aCheck the status of each OBR in the HL7 file in this order of priority:

1. If any are a C then the PDF report would be a C (Corrected).
2. If any are a P and none are a C, then the PDF report would be a P (Preliminary).
3. If any are an I and none are a C or a P, then the PDF report would be an I (Partial).
4. If all are an F or a combination of F and X, then the PDF report would be an F (Final).
5. If all are an X then the PDF report would be an X (Canceled).

Field	Name	Req'd	Type	Length	Repeat	Comments
OBX.15	Producer's ID	C	CE	60	N	<p>This field is passed through the Quantum Hub with no validations or transformations.</p> <p>The unique identifier of the responsible filler.</p> <p>For version 2.3:</p> <p>This is formatted as:</p> <p>AT^^L</p> <p>For version 2.3.1:</p> <p>This is formatted as:</p> <p>AT</p>
15.01	Identifier	O	ST			
15.02	Text	O	ST			
15.03	Name of Coding System	O	ID			
15.04	Alternate Identifier	O	ST			
15.05	Alternate Text	O	ST			
15.06	Name of Alternate Coding System	O	ID			
OBX.16	Responsible Observer	X				
OBX.17	Observation Method	X				

NTE—Notes and Comments segment

The Notes and Comments (NTE) segment contains notes and comments for ORU messages and is optional.

Field	Name	Req'd	Type	Length	Repeat	Comments
NTE.00	Segment Type ID	A	ST	4	N	This is NTE.
NTE.01	Set ID	A	SI	4	N	This field is used to group multiple NTE segments in a message.
NTE.02	Source of Comment	C	ID	2	N	This field is conditional, as follows: When the NTE segment follows an OBX segment and is used to report Total Urine Volume (TUV) results, the value for this field is R.
NTE.03	Comment	C	ST	72	2.3: N 2.3.1: Y	Each new line is sent in a new NTE segment. Blank lines and leading spaces are retained for correct data representation. When the NTE segment follows an OBX segment and is used to report Total Urine Volume (TUV) results, the value for this field is URINE VOLUME: value (where value is the numeric value of the urine volume. For example: URINE VOLUME: 1200/24

Embedded PDF segments

Your Hub account must be configured to receive embedded PDFs; otherwise, the PDFs will be bundled with the HL7 results file. In addition, your Hub account configuration determines the type of PDFs—clinical (standard), enhanced, or both—that will be available.

OBR and OBX segment pairs for embedded PDFs

When PDFs are embedded in the result message, they appear in pairs of OBR and OBX segments (1 OBR segment for 1 OBX segment) at the end of the HL7 file. Both segments contain the PDF report label and description, but the OBX segment contains the actual PDF (in Base64-encoded format). The OBR and OBX segments for embedded PDFs are populated as follows:

- **OBR segment.** OBR.04 (*Universal Service ID*) contains the PDF report label (clinical or enhanced and PDF sequence number) and report description (clinical or enhanced plus accession number from OBR.03 of the first OBR segment in the result message plus the PDF sequence number). The subfield values and formats are shown in detail in [“OBR.04” on page 458](#)
All other OBR fields in the embedded PDF OBR segment match the values in the first OBR segment of the result message
- **OBX segment.** The following fields are populated:
 - OBX.02 (*Value Type*) contains ED, indicating embedded data
 - OBX.03 (*Observation Identifier*) contains the PDF report label (clinical or enhanced and PDF sequence number) and report description (clinical or enhanced plus accession number from OBR.03 of the first OBR segment in the result message plus PDF sequence number). The subfield values and formats are shown in detail in [“OBX.03” on page 470](#)
 - OBX.05 (*Observation Value*) contains the ID of the BU sending the PDF and the actual PDF in Base64-encoded format. The subfield values and formats are shown in detail in [“OBX.05” on page 473](#). For information on decoding the Base64, see [“Decoding Base64 PDFs” on the next page](#)

Example format for embedded PDF segments

The sample format below uses placeholders to show the data that will be available in the paired OBR-OBX embedded PDF segments.

Fields specific to embedded PDFs are in **bold text**, and the placeholder values are in *italic text*.

```
OBR|setid|ordernumber|accessionnumber|reporttype#^reporttype accessionnumber-  
#^^reporttype#^
```

```
reporttype accessionnumber-  
#|||datetimestamp|||||datetimestamp||orderingprovider|||||  
datetimestamp|||resultstatus
```

```
OBX|setid|ED|reporttype#^report type accessionnumber-#^^reporttype#^report type  
accessionnumber-#||labid^Image^PDF^Base64^base64encodeddata
```

The following example for a clinical PDF report assumes there are 6 OBR segments preceding the embedded PDF OBR segment. Thus, the embedded PDF OBR sequence number is 7.

Fields specific to embedded PDFs are in **bold text**.

```
OBR|7|0627002|CB016454A|ClinicalPDFReport1^Clinical PDF Report CB016454A-1^^Clin-  
icalPDFReport1^  
Clinical PDF Report CB016454A-1||||20240628070000|||||||20240628145400|I|3333333333^  
PHYSICIANLAST^PHYSICIANFIRST^MIDDLE^^^NPI|||||20240628145900|||F
```

```
OBX|1|ED|ClinicalPDFReport1^Clinical PDF Report CB016454A-1^^Clin-
icalPDFReport1^Clinical PDF Report CB016454A-
1||WDL^Image^PDF^Base64^JVBERi0xLjMKJf////8KCjEgMCMCBvYmoKPDwKL1BhZ2VMYX1vKL1
BhZ2VNb2RlIC9Vc2VOb25lCi9QYWdlcyAyIDAgUdi0xLjMKJ3fHxBYmNkZWZer2h-
pamtsbW5vcF5BfHwyMDA0MDEzMxN
fHx8fHx8fHxUKL1BhZ2VNb2RlIC9VYIDAgUgovVHlwZ . . . (Base64 example truncated)
```

Decoding Base64 PDFs

Base64 encoding translates binary data such as PDFs into text. This encoding is necessary when PDFs must be transferred in HL7 or XML, which are both text formats. For an example of the embedded PDF segments and the Base64 encoding, see [“Example format for embedded PDF segments” on the previous page](#).

To decode the encoded PDF back to binary format, do the following:

- 1 Extract the Base64-encoded data from the HL7 message.
- 2 Decode the Base64 data into binary data using whatever tool you use for development. For example, Java and .NET both have libraries that convert Base64-encoded data into binary data.
- 3 Save/process the binary data for your EMR system using a PDF tool such as Adobe Acrobat or Ghostscript.

Sample lab results HL7 2.3/2.3.1 messages

This section shows several Observational Report—Unsolicited (ORU) messages from various Quest Diagnostics laboratories/business units (BUs), formatted according to the “[Lab results HL7 2.3/2.3.1 message format requirements](#)” on page 443 and “[Lab results HL7 2.3/2.3.1 message segment specifications](#)” on page 445.

Sample 1—Wood Dale BU

The following sample 2.3.1 result message shows 3 OBR segments and, within each OBR segment, multiple OBX segments. Several OBX segments include NTE segments with observation results that don’t appear in OBX.05 (*Observation Value*).

The first OBR segment has OBR.20 (*Filler Field 1*) populated, showing the component code of the profile. ORB.20 is populated only when profiles were ordered. In addition, the results in the first OBR segment are preliminary, as indicated by the P value in OBR.25 (*Result Status*). The results in the other 2 OBR segments are final, as indicated by the F value in OBR.25.

All OBX segments except for the last report LOINC in OBX.03 (*Observation Identifier*) in addition to the local lab code.

```
MSH|^~\&|LAB|WDL||1901307020241209230702|||ORU^R01|800000000000000037382|D|2.3.1
PID|1|ID123|CB018674A||PTLASTNAME^PTFIRSTNAME||19900115|F|||||^972^5551234|||||
|999654322
ORC|RE||CB018674A||IP|||||1122334455^DRLASTNAME^DRFIRSTNAME^^^^^^^NPI
OBR|1||CB018674A|4446^CULTURE, AEROBIC AND ANAEROBIC W/GRAM STAIN^^4446X=^CULTURE,
AEROBIC AND ANAEROBIC W/GRAM
STAIN||20240405155500|||||20241209204500||1122334455^DRLASTNAME^
DRLASTNAME^^^^^^^NPI|||4469^^4469^CULTURE, ANAEROBIC BACTERIA W/GRAM
STAIN|CB^Quest Diagnostics-Wood Dale^1355 Mittel Blvd^Wood Dale^IL^60191-
1024^DRFIRSTNAME MI DRLASTNAME, M.D. ||MC|P
OBX|1|ST|31208-2^Specimen source XXX^LN^75000000^SOURCE:^QDIWDL||ABSCCESS,
NECK|||||P|||
20241209174201|CB
OBX|2|ST|8251-1^Service Cmnt XXX-
Imp^LN^75000100^STATUS:^QDIWDL||PRELIMINARY|||||P|||
20241209174201|CB
OBX|3|ST|635-3^Bacteria XXX Anaerobe Cult^LN^75001700^RESULT:^QDIWDL||LISTED
BELOW|||||P|||
20240717174201|CB
OBX|4|TX|664-3^Gram Stn XXX^LN^75000250^GRAM STAIN:^QDIWDL||SEE NOTE|||||P|||
20240717174201|CB
NTE|1
NTE|2||Few
NTE|3||White blood cells seen
NTE|4||Many
NTE|5||Gram positive cocci
NTE|6||Moderate
NTE|7||Gram positive bacilli
OBX|5|TX|43409-2^Bacteria Islt Cult^LN^75000300^ISOLATE 1:^QDIWDL||SEE
NOTE|||||P|||20201209174201|CB
NTE|1
```

NTE|2||Moderate growth of
 NTE|3||Gram positive bacilli
 NTE|4||Identification to follow
 OBX|6|ST|44841-5^Bacteria XXX Cult org #2^LN^75000400^ISOLATE
 2:^QDIWDL||DNR|||N|||P|||
 20241209174201|CB
 OBX|7|ST|44842-3^Bacteria XXX Cult org #3^LN^75000500^ISOLATE
 3:^QDIWDL||DNR|||N|||P|||
 20241209174201|CB
 OBX|8|ST|44844-9^Bacteria XXX Cult org #4^LN^75000600^ISOLATE
 4:^QDIWDL||DNR|||N|||P|||
 20241209174201|CB
 OBX|9|ST|44845-6^Bacteria XXX Cult org #5^LN^75000700^ISOLATE
 5:^QDIWDL||DNR|||N|||P|||
 20241209174201|CB
 OBX|10|ST|8251-1^Service Cmnt XXX-Imp^LN^75001200^COMMENT:^QDIWDL||DNR|||N|||P|||
 20241209174201|CB
 OBR|2||CB018674A|4446^CULTURE, AEROBIC AND ANAEROBIC W/GRAM STAIN^^4446X=^CULTURE,
 AEROBIC AND ANAEROBIC W/GRAM
 STAIN|||20241209155500|||20241209204500||1122334455^DRLASTNAME^
 DRLASTNAME^^^^^^^^^^NPI|||4550^^^4550^CULTURE, AEROBIC BACTERIA |CB^Quest Dia-
 gnostics-Wood Dale^1355 Mittel Blvd^Wood Dale^IL^60191-1024^DRFIRSTNAME MI
 DRLASTNAME, M.D.|
 20241209174201||MC|F
 OBX|1|ST|31208-2^Specimen source XXX^LN^75000000^SOURCE:^QDIWDL||ABSCCESS,
 NECK|||F|||
 20241209174201|CB
 OBX|2|ST|8251-1^Service Cmnt XXX-Imp^LN^75000100^STATUS:^QDIWDL||FINAL|||F|||
 20241209174201|CB
 OBX|3|ST|634-6^Bacteria XXX Aerobe Cult^LN^75001800^RESULT:^QDIWDL||LISTED
 BELOW|||F|||
 20241209174201|CB
 OBX|4|TX|43409-2^Bacteria Islt Cult^LN^75000300^ISOLATE 1:^QDIWDL||SEE
 NOTE|||A|||F|||
 20241209174201|CB
 NTE|1
 NTE|2||Heavy growth of
 NTE|3||Staphylococcus aureus
 OBX|5|ST|44841-5^Bacteria XXX Cult org #2^LN^75000400^ISOLATE
 2:^QDIWDL||DNR|||N|||F|||
 20241209174201|CB
 OBX|6|ST|44842-3^Bacteria XXX Cult org #3^LN^75000500^ISOLATE
 3:^QDIWDL||DNR|||N|||F|||
 20241209174201|CB
 OBX|7|ST|44844-9^Bacteria XXX Cult org #4^LN^75000600^ISOLATE
 4:^QDIWDL||DNR|||N|||F|||20241209174201|CB
 OBX|8|ST|44845-6^Bacteria XXX Cult org #5^LN^75000700^ISOLATE
 5:^QDIWDL||DNR|||N|||F|||
 20241209174201|CB
 OBX|9|ST|8251-1^Service Cmnt XXX-Imp^LN^75001200^COMMENT:^QDIWDL||DNR|||N|||F|||
 20241209174201|CB

OBR|3||CB018674A|AEAPOS1^CULTURE, AEROBIC BACTERIA ^^AEAPOS1^CULTURE, AEROBIC BACTERIA |||

2024

1209155500|||||

20241209204500||1122334455^DRLASTNAME^DRFIRSTNAME^^^^^^^^^^NPI||||CB^

Quest Diagnostics-Wood Dale^1355 Mittel Blvd^Wood Dale^IL^60191-1024^DRFIRSTNAME MI DRLASTNAME, M.D.|20241209174201||MS|F

OBX|1|TX|43409-2^Bacteria Islt

Cult^LN^75013000^ISOLATE^QDIWDL|||||F|||20240717174201|CB

NTE|1||Staphylococcus aureus

OBX|2|ST|18862-3^Amoxicillin+Clav Susc

Islt^LN^77000105^AMOXICILLIN/CLAVULANIC^QDIWDL||

<4/2~S|||||F|||20241209174201|CB

OBX|3|ST|18865-6^Ampicillin+Sulbac Susc

Islt^LN^77000315^AMPICILLIN/SULBACTAM^QDIWDL||

<8/4~S|||||F|||20241209174201|CB

OBX|4|ST|18878-9^Cefazolin Susc

Islt^LN^77000905^CEFAZOLIN^QDIWDL||DNR|||N|||F|||20241209174201|CB

OBX|5|ST|19000-9^Vancomycin Susc Islt^LN^77002405^VANCOMYCIN^QDIWDL||<1~S|||||F|||

20241209174201|CB

OBX|6|ST|18906-8^Ciprofloxacin Susc

Islt^LN^77002705^CIPROFLOXACIN^QDIWDL||>8~R|||||F|||

20241209174201|CB

OBX|7|ST|18908-4^Clindamycin Susc

Islt^LN^77002805^CLINDAMYCIN^QDIWDL||>4~R|||||F|||

20241209174201|CB

OBX|8|ST|20629-2^L-Floxacin Susc

Islt^LN^77003305^LEVOFLOXACIN^QDIWDL||DNR|||N|||F|||

20241209174201|CB

OBX|9|ST|29258-1^Linezolid Susc

Islt^LN^77003315^LINEZOLID^QDIWDL||DNR|||N|||F|||20241209174201|CB

OBX|10|ST|18919-1^Erythromycin Susc

Islt^LN^77003405^ERYTHROMYCIN^QDIWDL||4~I|||||F|||20241209174201|CB

OBX|11|ST|18928-2^Gentamicin Susc Islt^LN^77003705^GENTAMICIN^QDIWDL||<1~S|||||F|||

20241209174201|CB

OBX|12|ST|18961-3^Oxacillin Susc Islt^LN^77005005^OXACILLIN^QDIWDL||<0.5~S|||||F|||

20241209174201|CB

OBX|13|ST|18964-7^Penicillin Susc Islt^LN^77005215^PENICILLIN^QDIWDL||DNR|||N|||F|||

20241209174201|CB

OBX|14|ST|23640-6^Quinupristin+Dalfofprist Susc

Islt^LN^77005305^QUINOPRISTIN/DALFOPRISTIN^

QDIWDL||DNR|||N|||F|||20241209174201|CB

OBX|15|ST|18974-6^Rifampin Susc Islt^LN^77005605^RIFAMPIN^QDIWDL||DNR|||N|||F|||

20241209174201|CB

OBX|16|ST|18993-6^Tetracycline Susc Islt^LN^77006005^TETRACYCLINE^QDIWDL||

>8~R|||||F|||20241209174201|CB

OBX|17|TX|18998-5^TMP SMX Susc Islt^LN^77006505^TRIMETHOPRIM/SULFA^QDIWDL||

<0.5/9.5~S|||||F|||20241209174201|CB

NTE|1

NTE|2||Legend:

NTE|3||S = Susceptible I = Intermediate

NTE|4||R = Resistant NS = Not susceptible
NTE|5||* = Not tested NR = Not reported
NTE|6||**NN = See antimicrobial comments
OBX|18|ST|^77007005^MOXIFLOXACIN^QDIWDL||DNR|||N|||F||20241209174201|CB

Sample 2—Auburn Hills BU

The following is a sample 2.3.1 Result ORU file showing truncated delimiters.

```
MSH|^~\&|LAB|AHL||22244520|20241209005234||ORU^R01|80000000000000000789|P|2.3.1  
PID|1||CHART^^^CID~MEDICAL^^^MRN|5513904|PTLASTNAME^PTFIRSTNAME||19750825|M|||10  
Parkway Drive^Apt. 4^Mason^OH^45040||^716^5550120|||987-65-4320||  
ORC|RE|5144168|AH942065T||CM|||1122334455^LAST^FIRST^^^NPI  
OBR|1|5144168|AH942065T|6399^CBC (INCLUDES DIFF/PLT)^6399SB=^CBC (INCLUDES  
DIFF/PLT)|||  
2024  
1209000000|||20241209034200||1122334455^DRLASTNAME^DRFIRSTNAME^^^NPI|||BH^  
Quest Diagnostics-Auburn Hills^4444 Giddings Rd^Auburn Hills^MI^48326-1533^DR.  
FIRSTNAME LASTNAME, MD|20241209005100||F  
OBX|1|NM|^30000000^WHITE BLOOD CELL COUNT^QDIAHL||8.2|Thousand/uL|3.8-  
10.8|N||F|||  
20241209005100|BH
```

Sample 3—Embedded PDF

The following is a sample 2.3.1 Result ORU file showing an embedded PDF file in the last pair of OBR and OBX segments.

```
MSH|^~\&|LAB|SKB||7009589|20241209224502||ORU^R01|8000000000000000038410|D|2.3.1  
PID|1|143577|CB018502A||Test^TC33||19220403|F|||^972^9163000|||0201139|1112-  
22422  
NTE|1|TX|FASTING: NO  
ORC|RE|113334|CB018502A||CM|||1122334455^ALLAN^JOSEPH^^^NPI  
OBR|1|113334|CB018502A|7573^IRON AND TOTAL IRON BINDING CAPACITY^^7573SB=^IRON AND  
TOTAL IRON BINDING  
CAPACITY||20241209071000|||20241209081100||1122334455^ALLAN^JOSEPH^^^NPI  
NPI|||CB^Quest Diagnostics-Wood Dale^1355 Mittel Blvd^Wood Dale^IL^60191-  
1024^DRFIRSTNAME MI DRLASTNAME, M.D.|20241209193201||F  
OBX|1|NM|2498-4^Iron SerPl-mCnc^LN^25002600^IRON, TOTAL^QDIWDL||125|mcg/dL|40-  
160|N||F|||  
20241209193201|CB  
OBX|2|NM|2500-7^TIBC SerPl-mCnc^LN^25002700^IRON BINDING CAPACITY^QDIWDL||180|m-  
cg/dL|250-450|  
L||F||20241209193201|CB  
OBX|3|NM|2502-3^Iron Satn SerPl-mRto^LN^25002800^% SATURATION^QDIWDL||69|% (cal-  
c)|15-50|H|||  
F||20241209193201|CB  
OBR|2|113334|CB018502A|ClinicalPDFReport1^Clinical PDF Report CB018502A-1^^Clin-  
icalPDFReport1^  
Clinical PDF Report CB018502A-1||20241209071000|||20241209081100||1122334455^  
DRLASTNAME^DRFIRSTNAME^^^NPI|||20241209193201||F
```

OBX|1|ED|ClinicalPDFReport1^Clinical PDF Report CB018502A-1^^Clin-
icalPDFReport1^Clinical PDF Report CB018502A-
1||SKB^Image^PDF^Base64^JVBERi0xLjQKJeLjz9MKMyAwIG9iago8PC9GaWx0ZXIvRmxhd
GVEZWNvZGUvTGluZ3RoIDEwPj5zdHJlYW0KeJwr5AIAAO4AfApl-
bmRzdHJlYW0KZW5kb2JqCjQgMCBvYmoKPDwvRmlsdGV
yL0ZsYXRlRGVjb2R1L0x1-
bmd0aCA2Mj4+c3RyZWFTcnicUwjkKuRyCuHSj8g0ULBUCenjMlQwAEJDBVNjIwVjA4WQXC6NA
Ed3V6Civ5uCoWZIFp-
drCFcgFwBVLQvJCmVuZHN0cmVhbQplbmRvYmoKNiAwIG9iago8PC9GaWx0ZXIvRmxhdGVEZWNvZGU
vTGluZ3RoIDI2NTM+... **Base64 content truncated**|||||F

Chapter 16: Lab results HL7 LRI 2.5.1 specification

In this chapter:

- About the lab results HL7 LRI 2.5.1 specification 486
- HL7 LRI 2.5.1 results message format requirements 487
- HL7 LRI 2.5.1 results segment specifications 490
- Embedded PDF segments 543

About the lab results HL7 LRI 2.5.1 specification

This chapter provides detailed format specifications for lab results that are sent from a Quest lab to EMRs. Results are formatted according to the *HL7 LRI 2.5.1 Standard*, with any exceptions noted in this chapter.

Note: This specification was constructed assuming you have access to the *HL7 LRI 2.5.1 Standard*. Therefore, much of the information in the *HL7 LRI 2.5.1 Standard* has not been repeated in this specification.

The following message type is supported: `ORU^R01^ORU_R01`—Observational Report—Unsolicited Observation Message.

This chapter includes the following sections:

- **Result message format requirements.** For information on the message format requirements, see [“HL7 LRI 2.5.1 results message format requirements” on the next page](#)
- **Result message segment specifications.** Each result message contains a number of standard segments. For requirements on the standard segments of a result message, see [“HL7 LRI 2.5.1 results segment specifications” on page 490](#)
- **Embedded PDFs.** For information on receiving embedded PDFs, see [“Embedded PDF segments” on page 543](#)
- **Sample result messages.** For sample LRI 2.5.1 result messages, see [“Sample lab results HL7 LRI 2.5.1 messages” on page 438](#)

HL7 LRI 2.5.1 results message format requirements

Each HL7 LRI 2.5.1 results message from a Quest lab adheres to the requirements outlined in this section.

In addition to the field-level validation detailed in “[HL7 LRI 2.5.1 results segment specifications](#)” on [page 490](#), each ORU^R01^ORU_R01 message is validated by the Quantum Hub to ensure compliance with the rules outlined in this section.

Message segment hierarchy

HL7 LRI 2.5.1 results messages adhere to the following message segment hierarchy.

Note: In the hierarchy shown below, braces ({}) indicate where multiple items are allowed, and brackets ([]) indicate items that are optional.

Segment ID	Req'd	Cardinality	Description
MSH	R	[1..1]	Message header
{	R	[1..1]	PATIENT_RESULT Begin
[O	[0..1]	PATIENT Begin
PID	R	[1..1]	Patient Identification
[{{NTE}}	O	[0..*]	Notes and Comments for PID
[O	[0..1]	VISIT Begin
PV1	O	[1..1]	Patient Visit
]			VISIT End
]			PATIENT End
{	R	[1..*]	ORDER_OBSERVATION Begin
ORC	R	[1..1]	Order Common
OBR	R	[1..1]	Observation Request
[{{NTE}}	O	[0..*]	Notes and Comments for OBR
[{{	O	[0..*]	OBSERVATION Begin
OBX	R	[1..1]	Observation Related to OBR
[{{NTE}}	O	[0..*]	Notes and Comments for OBX
}}			OBSERVATION End
[{{	O	[0..*]	SPECIMEN Begin
SPM	R	[1..1]	Specimen Information Related to OBR
}}			SPECIMEN End
}			ORDER_OBSERVATION End
}			PATIENT_RESULT End

Message segment requirements

The following table describes the parameters used to define the message segments listed on the previous page.

Parameter	Description
Required (Req'd)	Each segment is classified with 1 of the following requirement classifications: <ul style="list-style-type: none">• R (Required): The segment is present in the message• O (Optional): The segment may or may not be present in the message, depending on whether or not the data is available
Cardinality	Each segment is classified with 1 of the following cardinality classifications: <ul style="list-style-type: none">• [0..1]: Optional, but if present will occur only 1 time• [1..1]: Will occur 1 time• [0..n]: Optional, but if present can recur up to <i>n</i> times• [1..n]: Will occur at least 1 time and can recur up to <i>n</i> times• [0..*]: Optional, but if present can recur an unlimited number of times• [1..*]: Will occur at least 1 time and can recur an unlimited number of times

Field requirements

The following table describes the parameters used to define the data fields within each message segment listed in “[HL7 LRI 2.5.1 results segment specifications](#)” on page 490.

Parameter	Description
Required (Req'd)	Each field is classified with 1 of the following requirement classifications: <ul style="list-style-type: none">• R (Required): If the corresponding segment is present, the field will always be available in the message• RE (Required But May Be Empty): If the corresponding segment is present, the field may be available in the message. The receiving system must accept a value if present in an RE field, but must not reject the message if the field is blank• O (Optional): The field may or may not have a value depending on the data available• C (Conditional): The field may or may not be present depending on certain conditions that are stipulated in the <i>Comments</i> column of each segment table• CE (Conditional But May Be Empty): The field may or may not be populated depending on the conditions stipulated in the <i>Comments</i> column. However, even if those conditions are met, the field could still be empty• X (Not Supported): The field is not supported in this message and thus no value is returned. The corresponding field appears in <i>gray text</i> in the segment tables
Type	An HL7 standard data type as defined in the <i>HL7 LRI 2.5.1 Standard</i> .

Parameter	Description
Length	The maximum length for the field for each repeat of data.
Repeat	Each field is classified with 1 of the following values: <ul style="list-style-type: none">• N: May not repeat• Y: May repeat any number of times• Y/n: May repeat up to <i>n</i> times

Field delimiters

Each field is delimited by a vertical bar (|). Even if a field contains no data, it is still delimited if there is additional data in the segment. The delimiter for any given HL7 message is always defined in the MSH segment of the message as the first character following the segment identifier in MSH.01 (*Field Separator*).

Standard HL7 delimiters are always used. These are defined in MSH.02 (*Encoding Characters*) as:

- component separator (^)
- repetition separator (~)
- escape character (|)
- sub-component separator (&)

HL7 LRI 2.5.1 results segment specifications

This section provides detailed specifications for each segment of an HL7 LRI 2.5.1 results message. Message segments include the following:

- “MSH—Message Header” below
- “PID—Patient Identifier segment” on page 493
- “PV1—Patient Visit Data segment” on page 501
- “ORC—Common Order segment” on page 504
- “OBR—Observation Request segment” on page 514
- “OBX—Observation/Result segment” on page 525
- “NTE—Notes and Comments segment” on page 537
- “SPM—Specimen segment” on page 538

MSH—Message Header

The Message Header (MSH) segment defines the intent, source, destination, and some specifics of the syntax of a message.

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.00	Segment Type Identifier	R	ST	4	N	This is MSH.
MSH.01	Field Separator	R	ST	1	N	The separator between the message segment ID (MSH) and the first data field (MSH.02), which defines the character to be used as a separator for the rest of the message. This is always a vertical bar ().
MSH.02	Encoding Characters	R	ST	4	N	The following characters may be used: <ul style="list-style-type: none">• ^ (component separator)• ~ (repetition separator)• \ (escape character)• & (sub-component separator)
MSH.03	Sending Application	RE	HD_NG	227	N	The sending application.
03.01	Namespace ID	R	IS			One of the following: <ul style="list-style-type: none">• LAB

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> • QLS • AME
03.02	Universal ID	X				
03.03	Universal ID Type	X				
MSH.04	Sending Facility	R	HD_NG	227	N	The sending facility.
04.01	Namespace ID	C	IS			This contains the 3-digit character ID of the facility where the test was performed.
04.02	Universal ID	C	ST			This is only used for sending the CLIA identifier.
04.03	Universal ID Type	C	ID			If a value is returned in MSH 04.02 (Universal ID) , then CLIA appears in this subfield.
MSH.05	Receiving Application	X				
MSH.06	Receiving Facility	R	HD_NG	227	N	The receiving facility.
06.01	Namespace ID	C	IS			The client number.
MSH.07	Date/Time of Message	R	TS_1	26	N	<p>The time zone offset included in this field is the default time zone for the message instance, and applies to all other date/time fields in the same message where a time zone offset is not included.</p> <p>The time zone will reflect Daylight Savings.</p> <p>This field is formatted as follows:</p> <pre>yyyymmddhhmmss[.s[s[s[s[s]]]]][+/-zzzz]</pre> <p>All parts of the field are required except for the following, which is optional:</p> <pre>[.s[s[s[s]]]] [+/-zzzz]</pre>
MSH.08	Security	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.09	Message Type	R	MSG	15	N	The type of message being transmitted, and the event leading to the creation of the message. This is always ORU^R01^ORU_R01 (results messages).
09.01	Message	R	ID			This is ORU.
09.02	Trigger	R	ID			This is R01.
09.03	Message	R	ID			This is ORU_R01.
MSH.10	Message Control ID	R	ST	20	N	A unique, 20-digit number that is generated by the Quanam Hub.
MSH.11	Processing ID	R	PT	3	N	This indicates whether this message is intended to be processed as a production, test, or debug message.
11.01	Processing ID	R	ID			Valid values are: <ul style="list-style-type: none"> • D: Debug (Development) • T: Training • P: Production
11.02	Processing Mode	X				
MSH.12	Version ID	R	VID	60	N	This is 2.5.1.
MSH.13	Sequence Number	R	NM	15	N	This is an incremental number for a given accession number.
MSH.14	Continuation Pointer	X				
MSH.15	Accept Acknowledgment Type	R	ID	2	N	This is AL (Always). An accept acknowledgment must be returned in response to this message.
MSH.16	Application Acknowledgment Type	R	ID	2	N	This is NE (Never). An application acknowledgment is not required to be returned in response to this message.
MSH.17	Country Code	X				
MSH.18	Character Set	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
MSH.19	Principal Language of Message	X				
MSH.20	Alternate Character Set Handling Scheme	X				
MSH.21	Message Profile Identifier	R	EI_GU	427	Y	This is the following: LRI_NG_RN_Profile^^ 2.16.840.1. 113883.9.20^ISO
21.01	Entity Identifier	R	ST			This is the following: LRI_NG_RN_Profile
21.02	Namespace ID	X				
21.03	Universal ID	R	ST			This is the following: 2.16.840.1. 113883.9.20
21.04	Universal ID Type	R	ID			This is ISO.

PID—Patient Identifier segment

The Patient Identifier (PID) segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.00	Segment Type ID	R	ST	4	N	This is PID.
PID.01	Set ID - PID	R	SI	4	N	This is 1. HL7 LRI 2.5.1 only allows 1 PID segment per message.
PID.02	Patient ID (External ID)	X				
PID.03	Patient Identifier List	R	CX_NG	250	Y	This field contains the list of identifiers used by the healthcare facility to uniquely identify a patient.
03.01	ID Number	R	ST			
03.02	Check Digit	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
03.03	Check Digit Scheme	X				
03.04	Assigning Authority	RE	HD_NG			<p>Valid values are:</p> <ul style="list-style-type: none"> • QDHID • QDHUB
03.05	Identifier Type Code	R	ID			<p>If the <i>Assigning Authority</i> is not QDHID or QDHUB, then this subfield is populated with 1 of the following identifier type codes:</p> <ul style="list-style-type: none"> • PI: Patient internal identifier • PT: Patient external identifier • PN: Person number • LACSN: Laboratory accession ID • ACSN: Accession ID • AN: Account number • ANON: Anonymous identifier • BSNR: Primary physician office number • NBSNR: Secondary physician office number • DDS: Dentist license number • DL: Driver's license number • DN: Doctor number • EN: Employer number • FI: Facility ID • HC: Health card number • LN: License number • MA: Patient Medicaid number • MB: Member number • MC: Patient's Medicare number • MCD: Practitioner Medicaid number • MR: Medical record number • PRN: Provider number

Field	Name	Req'd	Type	Length	Repeat	Comments
						<ul style="list-style-type: none"> • SID: Specimen ID • USID: Unique specimen ID • SS: Social Security number • U: Unspecified identifier • XX: Organization identifier
03.06	Assigning Facility	X				
03.07	Effective Date	X				
03.08	Expiration Date	X				
03.09	Assigning Jurisdiction	X				
03.10	Assigning Agency or Department	X				
PID.04	Alternate Patient ID - PID	X				
PID.05	Patient Name	R	XPN	250	Y	<p>The patient's name in the following format:</p> <p>Last Name^First Name^Middle Name^Suffix^Prefix^^Name Type Code</p> <ul style="list-style-type: none"> • If this field repeats, the legal name of the patient is reported first • If the patient name is not in the message, then the U (<i>Unspecified</i>) name type code is populated, as follows: ~^^^^^^U • If a mnemonic is sent for the patient name, then the second occurrence of the name is populated with S (<i>Coded pseudo-name</i>): ~56MN^^^^^^S
05.01	Family	R	FN			
05.02	Given	R	ST			
05.03	Second	RE	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
05.04	Suffix (e.g., Jr. or III)	RE	ST			
05.05	Prefix (e.g., Dr.)	O	ST			
05.06	Degree	X				
05.07	Name Type Code	RE	ID			<p>Valid values are:</p> <ul style="list-style-type: none"> L: The correct name was sent U: No patient name was provided S: The name was sent as a numeric value or character string
05.08	Name Representation Code	X				
05.09	Name Context	X				
05.10	Name Validity Range	X				
05.11	Name Assembly Order	X				
05.12	Effective Date	X				
05.13	Expiration Date	X				
05.14	Professional Suffix	X				
PID.06	Mother's Maiden Name	X				
PID.07	Date/Time of Birth	RE	TS_2/ TS_3	26	N	<p>This is the date of birth (DOB), with different requirements for base profiles and newborn screening profiles.</p> <p>For base profiles:</p> <p>The data type is TS_2, formatted as follows:</p> <pre>yyyymmdd[hh][mm][ss[.s[s[s[s]]]]][+/-zzzz]</pre>

Field	Name	Req'd	Type	Length	Repeat	Comments
						<p>Year, month, and day are required; all other parts of the field are optional.</p> <p>For newborn screening profiles:</p> <p>The data type is TS_3, formatted as follows: yyyyymmddhhmm[ss[.s[s[s[s[s]]]]]] [+/-zzzz]</p> <p>All parts of the field are required except for the following, which is optional: [.s[s[s[s]]]] [+/-zzzz]</p>
PID.08	Administrative Sex	R	IS	1	N	<p>The patient's gender.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> F: Female M: Male
PID.09	Patient Alias	X				
PID.10	Race	RE	CE	250	Y	<p>The patient's race. This field is populated with the value that was sent in the order message.</p>
10.01	Identifier	RE	ST			<p>The following are typical values for <i>Race Identifier</i>:</p> <ul style="list-style-type: none"> 1002-5: American Indian or Alaska Native 2028-9: Asian 2054-5: Black or African American 2076-8: Native Hawaiian or Other Pacific Islander 2106-3: White 2131-1: Other Race
10.02	Text	C	ST			<p>This subfield is populated if PID 10.01 (<i>Identifier</i>) does not contain a value.</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
10.03	Name of Coding System	C	ID			This subfield is populated if PID 10.01 (Identifier) contains a value.
10.04	Alternate Identifier	X				
10.05	Alternate Text	X				
10.06	Name of Alternate Coding System	X				
PID.11	Patient Address	O	XAD	250	Y	The patient's address.
11.01	Street Address	RE	SAD			
11.01.01	Street or Mailing Address	R	ST			
11.01.02	Street Name	O	ST			
11.01.03	Dwelling Number	O	ST			
11.02	Other Designation	RE	ST			
11.03	City	RE	ST			
11.04	State or Province	RE	ST			
11.05	Zip or Postal Code	RE	ST			
11.06	Country Code	RE	ID			
11.07	Address Type	RE	ID			
11.08	Other Geographic Designation	X				
11.09	County/Parish Code	RE	IS			
11.10	Census Tract	X				
11.11	Address Representation Code	X				
11.12	Address Validity Range	X				
11.13	Effective Date	X				
11.14	Expiration Date	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.12	County Code	X				
PID.13	Phone Number - Home	O	XTN	250	Y	The patient's personal phone number in the following format: ^^^^^Area Code^Local Number^^^^^
13.01	Telephone Number	X				
13.02	Tele-communication Use Code	X				
13.03	Tele-communication Equipment Type	X				
13.04	Email Address	X				
13.05	Country Code	X				
13.06	Area/City Code	O	NM	5		
13.07	Local Number	O	NM	9		
13.08	Extension	X				
13.09	Any Text	X				
13.10	Extension Prefix	X				
13.11	Speed Dial Code	X				
13.12	Unformatted Telephone number	X				
PID.14	Phone Number - Business	X				
PID.15	Primary Language	X				
PID.16	Marital Status	X				
PID.17	Religion	X				
PID.18	Patient Account Number	X				
PID.19	SSN Number - Patient	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PID.20	Driver's License Number - Patient	X				
PID.21	Mother's Identifier	X				
PID.22	Ethnic Group	O	CE	250	Y	
PID.23	Birth Place	X				
PID.24	Multiple Birth Indicator	X				
PID.25	Birth Order	X				
PID.26	Citizenship	X				
PID.27	Veterans Military Status	X				
PID.28	Nationality	X				
PID.29	Patient Death Date and Time	X				
PID.30	Patient Death Indicator	X				
PID.31	Identity Unknown Indicator	X				
PID.32	Identity Reliability Code	X				
PID.33	Last Update Date/Time	X				
PID.34	Last Update Facility	X				
PID.35	Species Code	X				
PID.36	Breed Code	X				
PID.37	Strain	X				
PID.38	Production Class Code	X				
PID.39	Tribal Citizenship	X				

PV1—Patient Visit Data segment

The Patient Visit Data (PV1) segment is used by registration/patient administration applications to communicate information on an account level basis.

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.00	Segment Type ID	O	ST	4	N	This is PV1.
PV1.01	Set ID - PV1	O	SI	4	N	This is 1. HL7 LRI 2.5.1 only allows 1 PV1 segment per message.
PV1.02	Patient Class	R	IS	1	N	This field is used by systems to categorize patients by site. Note: This field is subject to site-specific variations. The following are typical values: <ul style="list-style-type: none"> • E: Emergency • I: Inpatient • O: Outpatient • P: Preadmit • R: Recurring patient • B: Obstetrics • C: Commercial account • N: Not Applicable • U: Unknown
PV1.03	Assigned Patient Location	O	PL	80	N	The patient's initial assigned location or the location to which the patient is being moved, formatted as follows: Point of Care ^Room Number^ Bed Number^ Facility
03.01	Point of Care	O	IS			
03.02	Room Number	O	IS			
03.03	Bed Status	O	IS			
03.04	Facility	O	HD			
PV1.04	Admission Type	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.05	Preadmit Number	X				
PV1.06	Prior Patient Location	X				
PV1.07	Attending Doctor	X				
PV1.08	Referring Doctor	X				
PV1.09	Consulting Doctor	X				
PV1.10	Hospital Service	X				
PV1.11	Temporary Location	X				
PV1.12	Preadmit Test Indicator	X				
PV1.13	Re-admission Indicator	X				
PV1.14	Admit Source	X				
PV1.15	Ambulatory Status	X				
PV1.16	VIP Indicator	X				
PV1.17	Admitting Doctor	X				
PV1.18	Patient Type	X				
PV1.19	Visit Number	X				
PV1.20	Financial Class	X				
PV1.21	Charge Price Indicator	X				
PV1.22	Courtesy Code	X				
PV1.23	Credit Rating	X				
PV1.24	Contract Code	X				
PV1.25	Contract Effective Date	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.26	Contract Amount	X				
PV1.27	Contract Period	X				
PV1.28	Interest Code	X				
PV1.29	Transfer to Bad Debt Code	X				
PV1.30	Transfer to Bad Debt Date	X				
PV1.31	Bad Debt Agency Code	X				
PV1.32	Bad Debt Transfer Amount	X				
PV1.33	Bad Debt Recovery Amount	X				
PV1.34	Delete Account Indicator	X				
PV1.35	Delete Account Date	X				
PV1.36	Discharge Disposition	X				
PV1.37	Discharged to Location	X				
PV1.38	Diet Type	X				
PV1.39	Servicing Facility	X				
PV1.40	Bed Status	X				
PV1.41	Account Status	X				
PV1.42	Pending Location	X				
PV1.43	Prior Temporary Location	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
PV1.44	Admit Date/Time	O	TS	26	N	<p>This is the admit date/time.</p> <p>This field is to be used if the event date/time is different than the admit date/time or to document the date/time of an outpatient/emergency patient registration.</p> <p>This field is formatted as follows: yyyy[mm][dd][hh][mm][ss[.s[s[s[s]]]]] [+/-zzzz]</p> <p>The year is required; all other parts are optional.</p>
PV1.45	Discharge Date/Time	X				
PV1.46	Current Patient Balance	X				
PV1.47	Total Charges	X				
PV1.48	Total Adjustments	X				
PV1.49	Total Payments	X				
PV1.50	Alternate Visit ID	X				
PV1.51	Visit Indicator	X				
PV1.52	Other Healthcare Provider	X				

ORC—Common Order segment

The Common Order segment (ORC) is used to transmit basic information about the order that was used for testing such as identifiers for the order, who placed the order, when it was placed, etc.

Field	Name	Req'd	Type	Length	Repeat	Comments
ORC.00	Segment Type ID	R	ST	4	N	This is ORC.
ORC.01	Order Control	R	ID	2	N	This is RE.

Field	Name	Req'd	Type	Length	Repeat	Comments
ORC.02	Placer Order Number	RE	EI_NG	22	N	If populated, this field contains the placer application's order number. This is the same as OBR.02 (Placer Order Number) . Note that either ORC.02.02 (Namespace ID) or ORC.02.03 (Universal ID) and ORC.02.04 (Universal ID Type) will be populated.
02.01	Entity Identifier	R	ST			The requisition number.
02.02	Namespace ID	C	IS			
02.03	Universal ID	C	ST			
02.04	Universal ID Type	C	ID			
ORC.03	Filler Order Number	R	EI_NG	22	N	The order number associated with the filler's application. This is the same as OBR.03 (Filler Order Number) . Note that either ORC.02.02 (Namespace ID) or ORC.02.03 (Universal ID) and ORC.02.04 (Universal ID Type) will be populated.
03.01	Entity Identifier	R	ST			The accession number.
03.02	Namespace ID	C	IS			
03.03	Universal ID	C	ST			
03.04	Universal ID Type	C	ID			
ORC.04	Placer Group Number	RE	EI_NG	22	N	If populated, this field contains the placer application's group number. Note that either ORC.04.02 (Namespace ID) or ORC.04.03 (Universal ID) and ORC.04.04 (Universal ID Type) will be populated.
04.01	Entity Identifier	R	ST			The accession number.
04.02	Namespace ID	C	IS			
04.03	Universal ID	C	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
04.04	Universal ID Type	C	ID			
ORC.05	Order Status	O	ID	2	N	This field indicates whether the result is partial or final. Valid values are: <ul style="list-style-type: none"> • CM: Order complete • IP: Order incomplete, or contains pending items
ORC.06	Response Flag	X				
ORC.07	Quantity/Timing	X				
ORC.08	Parent	X				
ORC.09	Date/Time of Transaction	X				
ORC.10	Entered By	X				
ORC.11	Verify By	O	XCN_ NG	250	Y	Information about the person who verified the accuracy of the entered request, formatted as follows: ID Number^Last Name^First Name^Middle Name^Suffix^Prefix ^^^^^^Identifier Type Code^^^^^^^^^^
11.01	ID Number	RE	ST			
11.02	Family Name	RE	FN			
11.03	Given Name	RE	ST			
11.04	Second and Further Given Names or Initials Thereof	RE	ST			
11.05	Suffix (e.g. JR or III)	RE	ST			
11.06	Prefix (e.g. DR)	RE	ST			
11.07	Degree (e.g. MD)	X				
11.08	Source Table	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
11.09	Assigning Authority	X				
11.10	Name Type Code	X				
11.11	Identifier Check Digit	X				
11.12	Check Digit Scheme	X				
11.13	Identifier Type Code	C	HD_NG			This subfield is populated if ORC 11.01 (Verify By ID Number) contains a value.
11.14	Assigning Facility	X				
11.15	Name Representation Code	X				
11.16	Name Context	X				
11.17	Name Validity Range	X				
11.18	Name Assembly Order	X				
11.19	Effective Date	X				
11.20	Expiration Date	X				
11.21	Professional Suffix	X				
11.22	Assigning Jurisdiction	X				
11.23	Assigning Agency or Department	X				
ORC.12	Ordering Provider	R	XCN_NG	250		The provider that ordered the test. This is the same as OBR.16 (Ordering Provider) . This field is formatted as follows: NPI Number^Last Name^First Name^Middle Name^^^^^^^NPI
12.01	ID Number	RE	ST			The ordering provider's NPI number.

Field	Name	Req'd	Type	Length	Repeat	Comments
12.02	Family Name	RE	FN			
12.03	Given Name	RE	ST			
12.04	Second and Further Given Names or Initials Thereof	RE	ST			
12.05	Suffix (e.g., JR or III)	RE	ST			
12.06	Prefix (e.g., DR)	RE	ST			
12.07	Degree (e.g., MD)	X				
12.08	Source Table	X				
12.09	Assigning Authority	X				
12.10	Name Type Code	X				
12.11	Identifier Check Digit	X				
12.12	Check Digit Scheme	X				
12.13	Identifier Type Code	C	TS			This subfield is required if ORC 12.01 (Ordering Provider ID Number) contains a value. If populated, this subfield will always be NPI.
12.14	Assigning Facility	X				
12.15	Name Representation Code	X				
12.16	Name Context	X				
12.17	Name Validity Range	X				
12.18	Name Assembly Order	X				
12.19	Effective Date	X				
12.20	Expiration Date	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
12.21	Professional Suffix	X				
12.22	Assigning Jurisdiction	X				
12.23	Assigning Agency or Department	X				
ORC.13	Enterer's Location	X				
ORC.14	Call Back Phone Number	X				
ORC.15	Order Effective Date/Time	X				
ORC.16	Order Control Code Reason	X				
ORC.17	Entering Organization	X				
ORC.18	Entering Device	X				
ORC.19	Action By	X				
ORC.20	Advanced Beneficiary Notice Code	X				
ORC.21	Ordering Facility Name	O	XON	250	Y	The name of the facility that placed the order, formatted as follows: Name^^^^^^^^^^ Identifier
21.01	Organization Name	O	ST			The name of the facility that placed the order.
21.02	Organization Name Type Code	X				
21.03	ID Number	X				
21.04	Check Digit	X				
21.05	Check Digit Scheme	X				
21.06	Assigning Authority	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
21.07	Identifier Type Code	X				
21.08	Assigning Facility	X				
21.09	Name Representation Code	X				
21.10	Organization Identifier	O	ST			
ORC.22	Ordering Facility Address	O	XAD	250	Y	The address of the facility that placed the order, formatted as follows: Street Address^Other Designation^City^State^Zip or Postal Code^Country Code^Address Type^^^^^^
22.01	Street Address	RE	SAD			
22.01.01	Street or Mailing Address	RE	ST			
22.01.02	Street Name	RE	ST			
22.01.03	Dwelling Number	RE	ST			
22.02	Other Designation	RE	ST			
22.03	City	RE	ST			
22.04	State or Province	RE	ST			
22.05	Zip or Postal Code	RE	ST			
22.06	Country Code	RE	ID			
22.07	Address Type	RE	ID			Valid values are: <ul style="list-style-type: none"> • O for office/business • Blank
22.08	Other Geographic Designation	X				
22.09	County/Parish Code	X				
22.10	Census Tract	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
22.11	Address Representation Code	X				
22.12	Address Validity Range	X				
22.13	Effective Date	X				
22.14	Expiration Date	X				
ORC.23	Ordering Facility Phone Number	O	XTN	250	Y	The telephone number of the facility placing the order, formatted as follows: ^^^^Area/City Code^ Local Number^^^^
23.01	Telephone Number deprecated as of 2.3	X				
23.02	Tele-communication Use Code	X				
23.03	Tele-communication Equipment Type	X				
23.04	Email Address	X				
23.05	Country Code	X				
23.06	Area/City Code	O	NM			
23.07	Local Number	O	NM			
23.08	Extension	X				
23.09	Any Text	X				
23.10	Extension Prefix	X				
23.11	Speed Dial Code	X				
23.12	Unformatted Telephone number	X				
ORC.24	Ordering Provider Address	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
ORC.25	Order Status Modifier	X				
ORC.26	Advanced Beneficiary Notice Override Reason	X				
ORC.27	Filler's Expected Availability Date/Time	X				
ORC.28	Confidentiality Code	X				
ORC.29	Order Type	X				
ORC.30	Enterer Authorization Mode	X				
ORC.31	Parent Universal Service Identifier	C	CWE_ CR	250	N	The universal service identifier of the parent order. This field is populated if OBR.11 (Specimen Action Code) is populated.
31.01	Identifier	R	ST			This subfield is populated with the parent OBR 04.01 (Identifier) value.
31.02	Text	RE	ST			This subfield is populated with the parent OBR 04.02 (Text) value.
31.03	Name of Coding System	R	ID			This subfield is populated with the parent OBR 04.03 (Name of Coding System) value.
31.04	Alternate Identifier	RE	ST			This subfield is populated with the parent OBR 04.04 (Alternate Identifier) value.
31.05	Alternate Text	RE	ST			This subfield is populated with the parent OBR 04.05 (Alternate Text) value.

Field	Name	Req'd	Type	Length	Repeat	Comments
31.06	Name of Alternate Coding System	C	ID			This subfield is populated with the parent OBR 04.06 (Name of Alternate Coding System) value.
31.07	Coding System Version ID	X				
31.08	Alternate Coding System Version ID	X				
31.09	Original Text	X				
31.10	Second Alternate Identifier	X				
31.11	Second Alternate Text	X				
31.12	Second Name of Alternate Coding System	X				
31.13	Second Alternate Coding System Version ID	X				
31.14	Coding System OID	X				
31.15	Value Set OID	X				
31.16	Value Set Version ID	X				
31.17	Alternate Coding System OID	X				
31.18	Alternate Value Set OID	X				
31.19	Alternate Value Set Version ID	X				
31.20	Second Alternate Coding System OID	X				
31.21	Second Alternate Value Set OID	X				
31.22	Second Alternate Value Set Version ID	X				

OBR—Observation Request segment

The Observation Request segment (OBR) is used to report the type of testing that was performed on the specimen and ties that information to the order for the test. The details of each individual observation appear in corresponding OBX segments.

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.00	Segment Type ID	R	SI	4	N	This is OBR.
OBR.01	Set ID - OBR	R	SI	4	N	OBR segments grouped under a PID are numbered sequentially beginning with 1.
OBR.02	Placer Order Number	RE	EI_NG	22	N	The placer application's order number, which is the same as ORC.02 (Placer Order Number) . Note that either OBR 02.02 (Namespace ID) or OBR 02.03 (Universal ID) and OBR 02.04 (Universal ID Type) will be populated.
02.01	Entity Identifier	R	ST			
02.02	Namespace ID	C	IS			
02.03	Universal ID	C	ST			
02.04	Universal ID Type	C	ID			
OBR.03	Filler Order Number	R	EI_NG	22	N	The order number associated with the filler's application, which is the same as ORC.03 (Filler Order Number) . Note that either OBR 03.02 (Namespace ID) or OBR 03.03 (Universal ID) and OBR 03.04 (Universal ID Type) will be populated.
03.01	Entity Identifier	R	ST			
03.02	Namespace ID	C	IS			
03.03	Universal ID	C	ST			
03.04	Universal ID Type	C	ID			
OBR.04	Universal Service Identifier	R	CWE_ CR	250	N	The identifier code for the requested observation or test.
04.01	Identifier	R	ST			
04.02	Text	RE	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
04.03	Name of Coding System	R	ID			
04.04	Alternate Identifier	RE	ST			
04.05	Alternate Text	RE	ST			
04.06	Name of Alternate Coding System	C	ID			This is required if OBR 04.04 (Alternate Identifier) contains a value.
04.07	Coding System Version ID	O	ST			
04.08	Alternate Coding System Version ID	O	ST			
04.09	Original Text	RE	ST			
04.10	Second Alternate Identifier	O	ST			
04.11	Second Alternate Text	O	ST			
04.12	Second Name of Alternate Coding System	O	ID			
04.13	Second Alternate Coding System Version ID	O	ST			
04.14	Coding System OID	O	ST			
04.15	Value Set OID	X				
04.16	Value Set Version ID	X				
04.17	Alternate Coding System OID	X				
04.18	Alternate Value Set OID	X				
04.19	Alternate Value Set Version ID	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
04.20	Second Alternate Coding System OID	X				
04.21	Second Alternate Value Set OID	X				
04.22	Second Alternate Value Set Version ID	X				
OBR.05	Priority - OBR	X				
OBR.06	Requested Date/Time	X				
OBR.07	Observation Date/Time	R	TS_4	26	N	<p>The specimen collection date/time when the test involves a specimen; otherwise, the relevant date/time of the observation. Since a test may also involve drawing specimens at different times, this field only defines the draw of the first specimen.</p> <p>This field is formatted as follows: <code>yyyymmddhhmm[ss[.s[s[s[s]]]]][+/-zzzz]</code></p> <p>Formatting requirements are as follows:</p> <ul style="list-style-type: none"> • <code>YYYY</code>: Required • <code>mm</code>: Conditional; required if <code>YYYY</code> is not 0000 • <code>dd</code>: Conditional; required if <code>YYYY</code> is not 0000 • <code>hh</code>: Conditional; required if <code>YYYY</code> is not 0000 • <code>mm</code>: Conditional; required if <code>YYYY</code> is not 0000 • <code>[ss[.s[s[s[s]]]]]</code>: Conditional, optional if <code>YYYY</code> is not 0000 • <code>[+/-zzzz]</code>: Optional

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.08	Observation End Date/Time	X				
OBR.09	Collection Volume	X				
OBR.10	Collector Identifier	X				
OBR.11	Specimen Action Code	RE	ID	1	N	The action to be taken with respect to the specimens that accompany or precede this order. If populated, this field is G (for Reflex test).
OBR.12	Danger Code	X				
OBR.13	Relevant Clinical Information	X				
OBR.14	Specimen Received Date/Time	X				
OBR.15	Specimen Source	X				
OBR.16	Ordering Provider	R	XCN_ NG	250	N	The provider that ordered the test. This is the same as ORC.12 (Ordering Provider) . This field is formatted as follows: NPI Number^Last Name^First Name^Middle Name^^^^^^^NPI
16.01	ID Number	RE	ST			The ordering provider's NPI number.
16.02	Family Name	RE	FN			
16.03	Given Name	RE	ST			
16.04	Second and Further Given Names or Initials Thereof	RE	ST			
16.05	Suffix (e.g., JR or III)	RE	ST			

Field	Name	Req'd	Type	Length	Repeat	Comments
16.06	Prefix (e.g., DR)	RE	ST			
16.07	Degree (e.g., MD)	X				
16.08	Source Table	X				
16.09	Assigning Authority	X				
16.10	Name Type Code	X				
16.11	Identifier Check Digit	X				
16.12	Check Digit Scheme	X				
16.13	Identifier Type Code	C	ID			This subfield is required if OBR 16.01 (Ordering Provider ID Number) contains a value. If populated, this subfield is NPI.
16.14	Assigning Facility	X				
16.15	Name Representation Code	X				
16.16	Name Context	X				
16.17	Name Validity Range	X				
16.18	Name Assembly Order	X				
16.19	Effective Date	X				
16.20	Expiration Date	X				
16.21	Professional Suffix	X				
16.22	Assigning Jurisdiction	X				
16.23	Assigning Agency or Department	X				
OBR.17	Order Callback Phone Number	X				
OBR.18	Placer Field 1	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.19	Placer Field 2	X				
OBR.20	Filler Field 1	X				
OBR.21	Filler Field 2	X				
OBR.22	Results Rpt/Status Chng - Date/Time	R	TS_6	26	N	<p>The date/time the results were reported or the status was changed.</p> <p>This field is formatted as follows: <code>yyyymmddhhmmss[.s[s[s[s]]]][+/-zzzz]</code></p> <p>All parts of the field are required except for the following, which is optional: <code>[.s[s[s[s]]]][+/-zzzz]</code></p>
OBR.23	Charge to Practice	X				
OBR.24	Diagnostic Service Sect ID	X				
OBR.25	Result Status	R	ID	1	N	<p>The status of the result.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • A: Partial results • C: Correction to results • F: Final results • I: No results available. The specimen was received, but the procedure is incomplete • O: Specimen not yet received • P: Preliminary results • R: Results stored • S: No results available. The procedure is scheduled, but has not been performed • X: No results available. The order was canceled

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.26	Parent Result	C	PRL	400	N	If OBR.11 (<i>Specimen Action Code</i>) is populated, then this field is populated with the data in the parent OBX.03 (<i>Observation Identifier</i>) subfield.
26.01	Parent Observation Identifier	R	CWE_ CR			This subfield is populated with the parent OBX.03 (<i>Observation Identifier</i>) value.
26.01.01	Identifier	O	ST			This subfield is populated with the parent OBX 03.01 (<i>Identifier</i>) value.
26.01.02	Text	O	ST			This subfield is populated with the parent OBX 03.02 (<i>Text</i>) value.
26.01.03	Name of Coding System	O	ID			This subfield is populated with the parent OBX 03.03 (<i>Name of Coding System</i>) value.
26.01.04	Alternate Identifier	O	ST			This subfield is populated with the parent OBX 03.04 (<i>Alternate Identifier</i>) value.
26.01.05	Alternate Text	O	ST			This subfield is populated with the parent OBX 03.05 (<i>Alternate Text</i>) value.
26.01.06	Name of Alternate Coding System	O	ID			This subfield is populated with the parent OBX 03.06 (<i>Name of Alternate Coding System</i>) value.
26.02	Parent Observation Sub-Identifier	RE	ST			
26.03	Parent Observation Value Descriptor	X				
OBR.27	Quantity/Timing	X				
OBR.28	Result Copies To	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.29	Parent	C	EIP_NG	200	N	The parent. This field is populated if OBR.11 (Specimen Action Code) is populated. Note that either OBR 29.01.02 (Namespace ID) or OBR 29.01.03 (Universal ID) and OBR 29.01.04 (Universal ID Type) will be populated.
29.01	Placer Assigned Identifier	RE	EI_NG			
29.01.01	Entity Identifier	R	ST			The parent placer number, which is the same as ORC.02 (Placer Order Number) and OBR.02 (Placer Order Number) .
29.01.02	Namespace ID	C	IS			
29.01.03	Universal ID	C	ST			
29.01.04	Universal ID Type	C	ID			
29.02	Filler Assigned Identifier	C	EI_NG			The parent filler number, which is the same as ORC.03 (Filler Order Number) and OBR.03 (Filler Order Number) . Note that either OBR 29.02.02 (Namespace ID) or OBR 29.02.03 (Universal ID) and OBR 29.02.04 (Universal ID Type) will be populated.
29.02.01	Entity Identifier	R	ST			
29.02.02	Namespace ID	C	IS			
29.02.03	Universal ID	C	ST			
29.02.04	Universal ID Type	C	ID			
OBR.30	Transportation Mode	X				
OBR.31	Reason for Study	X				
OBR.32	Principal Result Interpreter	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.33	Assistant Result Interpreter	X				
OBR.34	Technician	X				
OBR.35	Transcriptionist	X				
OBR.36	Scheduled Date/Time	X				
OBR.37	Number of Sample Containers	X				
OBR.38	Transport Logistics of Collected Sample	X				
OBR.39	Collector's Comment	X				
OBR.40	Transport Arrangement Responsibility	X				
OBR.41	Transport Arranged	X				
OBR.42	Escort Required	X				
OBR.43	Planned Patient Transport Comment	X				
OBR.44	Procedure Code	X				
OBR.45	Procedure Code Modifier	X				
OBR.46	Placer Supplemental Service Information	X				
OBR.47	Filler Supplemental Service Information	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
OBR.48	Medically Necessary Duplicate Procedure Reason	X				
OBR.49	Result Handling	O	IS	2	N	<p>This field indicates whether or not an associated <i>Interactive Insights</i> report is available. Valid values are:</p> <ul style="list-style-type: none"> • II = report available • blank = no report available <p>If there are multiple OBR segments in the results message, only the value in the first OBR segment is used.</p>
OBR.50	Parent Universal Service Identifier	C	CWE_ CR	250	N	<p>The universal service identifier of the parent order.</p> <p>This field is populated if OBR.11 (Specimen Action Code) is populated.</p>
50.01	Identifier	R	ST			<p>If OBR.11 (Specimen Action Code) is populated, then this subfield is populated with the parent OBR 04.01 (Identifier) value.</p>
50.02	Text	RE	ST			<p>If OBR.11 (Specimen Action Code) is populated, then this subfield is populated with the parent OBR 04.02 (Text) value.</p>
50.03	Name of Coding System	R	ID			<p>If OBR.11 (Specimen Action Code) is populated, then this subfield is populated with the parent OBR 04.03 (Name of Coding System) value.</p>
50.04	Alternate Identifier	RE	ST			<p>If OBR.11 (Specimen Action Code) is populated, then this subfield is populated with the parent OBR 04.04 (Alternate Identifier) value.</p>

Field	Name	Req'd	Type	Length	Repeat	Comments
50.05	Alternate Text	RE	ST			If OBR.11 (Specimen Action Code) is populated, then this subfield is populated with the parent OBR 04.05 (Alternate Text) value.
50.06	Name of Alternate Coding System	C	ID			If OBR.11 (Specimen Action Code) is populated, then this subfield is populated with the parent OBR 04.06 (Name of Alternate Coding System) value.
50.07	Coding System Version ID	X				
50.08	Alternate Coding System Version ID	X				
50.09	Original Text	X				
50.10	Second Alternate Identifier	X				
50.11	Second Alternate Text	X				
50.12	Second Name of Alternate Coding System	X				
50.13	Second Alternate Coding System Version ID	X				
50.14	Coding System OID	X				
50.15	Value Set OID	X				
50.16	Value Set Version ID	X				
50.17	Alternate Coding System OID	X				
50.18	Alternate Value Set OID	X				
50.19	Alternate Value Set Version ID	X				

Field	Name	Req'd	Type	Length	Repeat	Comments
50.20	Second Alternate Coding System OID	X				
50.21	Second Alternate Value Set OID	X				
50.22	Second Alternate Value Set Version ID	X				

OBX—Observation/Result segment

The Observation/Result (OBX) segment is used to transmit a single lab-result value. It represents the smallest indivisible unit of a laboratory report. For OBR segments that contain discrete results, there can be multiple OBX segments per OBR. For OBR segments that contain embedded PDFs, there is only 1 OBX per OBR.

Field	Name	Req'd	Type	Length	Repeat	Comment
OBX.00	Segment Type ID	R	ST	10	N	This is OBX.
OBX.01	Set ID - OBX	R	SI	4	N	This is the sequence number for OBX segments grouped beneath the same OBR segment.
OBX.02	Value Type	C	ID	2	N	This defines the structure of OBX.05 (Observation Value) . This field is populated if OBX.05 contains a value. Valid values are: <ul style="list-style-type: none"> • CWE = Coded with exception • NM = Numeric data • SN = Structured numeric • ST = String data
OBX.03	Observation Identifier	R	CWE_ CR	250	N	LOINC shall be used as the standard coding system for this field if an appropriate LOINC code exists.

Field	Name	Req'd	Type	Length	Repeat	Comment
						If a local coding system is in use, a local code will also be sent to help with identification of coding issues. When no valid LOINC exists, the local code is the only code sent.
03.01	Identifier	R	ST			
03.02	Text	RE	ST			
03.03	Name of Coding System	R	ID			
03.04	Alternate Identifier	RE	ST			
03.05	Alternate Text	RE	ST			
03.06	Name of Alternate Coding System	C	ID			
03.07	Coding System Version ID	O	ST			
03.08	Alternate Coding System Version ID	O	ST			
03.09	Original Text	RE	ST			
03.10	Second Alternate Identifier	O				
03.11	Second Alternate Text	O				
03.12	Second Name of Alternate Coding System	O				
03.13	Second Alternate Coding System Version ID	O				
03.14	Coding System OID	O				
03.15	Value Set OID	X				
03.16	Value Set Version ID	X				

Field	Name	Req'd	Type	Length	Repeat	Comment
03.17	Alternate Coding System OID	X				
03.18	Alternate Value Set OID	X				
03.19	Alternate Value Set Version ID	X				
03.20	Second Alternate Coding System OID	X				
03.21	Second Alternate Value Set OID	X				
03.22	Second Alternate Value Set Version ID	X				
OBX.04	Observation Sub-ID	C	ST	20	N	A sequence number indicating how many times an OBX segment with the same OBX.03.01 (Identifier) appears under the OBR segment.
OBX.05	Observation Value	RE	Varies	Unlimited	N	<p>This field contains the normalcy status of the result being reported.</p> <p>This is an optional (but recommended) field. If populated, this field sets the test-level status.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> • L = Below low normal. The result is flagged as abnormal • LL = Below lower panic limits. The result is flagged as critical <p>If the reporting system only sent interpretation codes in OBX.08 (Abnormal Flags), then this field is empty.</p>

Field	Name	Req'd	Type	Length	Repeat	Comment
05.01, if OBX.02 (Value Type) has a value of CWE (Coded with exception).	Identifier	C	ST			Subfields 05.02 - 05.09 (as defined in the following rows) are populated if OBX.02 has a value of CWE.
05.02	Text	C	ST			
05.03	Name of Coding System	C	ID			
05.04	Alternate Identifier	C	ST			
05.05	Alternate Text	C	ST			
05.06	Name of Alternate Coding System	C	ID			This is ORG.
05.07	Coding System Version ID	C	ST			
05.08	Alternate Coding System Version ID	C	ST			
05.09	Original Text	C	ST			
05.01, if OBX.02 (Value Type) has a value of SN (Structured numeric).	Comparator	C	ST			Subfields 05.02 - 05.04 (as defined in the following rows) are populated if OBX.02 has a value of SN.
05.02	Num1	C	NM			
05.03	Separator/Suffix	C	ST			
05.04	Num2	C	NM			
OBX.06	Units	C	CWE_ CRE	250	N	The units of measure in which the result is reported.
06.01	Identifier	RE	ST			
06.02	Text	C	ST			
06.03	Name of Coding System	C	ID			

Field	Name	Req'd	Type	Length	Repeat	Comment
06.04	Alternate Identifier	X				
06.05	Alternate Text	X				
06.06	Name of Alternate Coding System	X				
06.07	Coding System Version ID	X				
06.08	Alternate Coding System Version ID	X				
06.09	Original Text	X				
06.10	Second Alternate Identifier	X				
06.11	Second Alternate Text	X				
06.12	Second Name of Alternate Coding System	X				
06.13	Second Alternate Coding System Version ID	X				
06.15	Value Set OID	X				
06.16	Value Set Version ID	X				
06.17	Alternate Coding System OID	X				
06.18	Alternate Value Set OID	X				
06.19	Alternate Value Set Version ID	X				
06.21	Second Alternate Value Set OID	X				
06.22	Second Alternate Value Set Version ID	X				

Field	Name	Req'd	Type	Length	Repeat	Comment
OBX.07	References Range	RE	ST	60	N	This field is populated if OBX.11 (<i>Observation Result Status</i>) does not contain a value of X (<i>Results cannot be obtained for this observation</i>).
OBX.08	Abnormal Flags	RE	IS	5	Y	This field contains the normalcy status of the result being reported. Valid values are: <ul style="list-style-type: none"> • L = Below low value • LL = Below lower panic limits • H = Above high normal • HH = Above upper panic limits • A = Alpha abnormal • AA = Alpha very abnormal • N = Normal • blank = No comment
OBX.09	Probability	X				
OBX.10	Nature of Abnormal Test	X				
OBX.11	Observation Result Status	R	ID	1	N	The observation result status. Valid values are: <ul style="list-style-type: none"> • C = A correction to the previously reported final result • D = Deletes the OBX record • F = Final results • I = Pending results

Field	Name	Req'd	Type	Length	Repeat	Comment
						<ul style="list-style-type: none"> • N = Not asked. This is used to affirmatively document that the observation identified in the OBX was not sought when the universal service ID in OBR.04 implies that it would be sought • O = The order detail description only (no result) • P = Preliminary results • R = Results entered but not verified • X = Results cannot be obtained • U = Results status change to final without retransmitting results already sent as preliminary. For example, radiology changes status from preliminary to final. • W = Post original as wrong. For example, transmitted for wrong patient.
OBX.12	Effective Date of Reference Range Values	X				
OBX.13	User Defined Access Checks	X				
OBX.14	Date/Time of the Observation	RE	TS_5	26	N	<p>The date and time that the observation was reported, formatted as follows:</p> <pre> yyyyymmddhhmm[ss[.s[s[s[s]]]]][+/-zzzz] </pre>

Field	Name	Req'd	Type	Length	Repeat	Comment
						All parts of the field are required except for the following, which is optional: [.s[s[s[s]]]] [+/- zzzz]
OBX.15	Producer's Reference	X				
OBX.16	Responsible Observer	O	XCN	250	Y	The laboratory technician who performed or verified the analysis. Some Quest <i>Responsible Observer</i> types are reported with initials, not full names, so initials might appear in OBX.16.02 (Family Name) and a dash in OBX.16.03 (Given Name) .
16.01	ID Number	O	ST			
16.02	Family Name	O	FN			
16.03	Given Name	O	ST			
16.04	Second and Further Given Names or Initials Thereof	O	ST			
16.05	Suffix (e.g., JR or III)	O	ST			
16.06	Prefix (e.g., DR)	O	ST			
16.07	Degree (e.g., MD)	X				
16.08	Source Table	X				
16.09	Assigning Authority	X				
16.10	Name Type Code	X				
16.11	Identifier Check Digit	X				

Field	Name	Req'd	Type	Length	Repeat	Comment
16.12	Check Digit Scheme	X				
16.13	Identifier Type Code	X				
16.14	Assigning Facility	X				
16.15	Name Representation Code	X				
16.16	Name Context	X				
16.17	Name Validity Range	X				
16.18	Name Assembly Order	X				
16.19	Effective Date	X				
16.20	Expiration Date	X				
16.21	Professional Suffix	O	ST			
16.22	Assigning Jurisdiction	X				
16.23	Assigning Agency or Department	X				
OBX.17	Observation Method	X				
OBX.18	Equipment Instance Identifier	X				
OBX.19	Date/Time of the Analysis	RE	TS_5	26	N	<p>The date and time of the analysis, formatted as follows:</p> <pre>yyyymmddhhmm[ss[.s[s[s[s]]]]][+/-zzzz]</pre> <p>All parts of the field are required except for the following, which is optional:</p> <pre>[.s[s[s[s]]]] [+/-zzzz]</pre>

Field	Name	Req'd	Type	Length	Repeat	Comment
OBX.20	Reserved for HL7 v2.6	X				
OBX.21	Reserved for HL7 v2.6	X				
OBX.22	Reserved for HL7 v2.6	X				
OBX.23	Performing Organization Name	R	XON_ NG	567	N	The CLIA number for the performing site.
23.01	Organization Name	RE	ST			The name of the performing site.
23.02	Organization Name Type Code	X				
23.03	ID Number	X				
23.04	Check Digit	X				
23.05	Check Digit Scheme	X				
23.06	Assigning Authority	X				
23.07	Identifier Type Code	C				If OBX 23.10 (<i>Organization Identifier</i>) contains a value, then this subfield is populated with FI.
23.08	Assigning Facility	C				If OBX 23.10 (<i>Organization Identifier</i>) contains a value, then this subfield is populated with CLIA.
23.09	Name Representation Code	X				
23.10	Organization Identifier	C				The CLIA number for the performing site.
OBX.24	Performing Organization Address	R	XAD	631	N	The address of the performing site, formatted as follows:

Field	Name	Req'd	Type	Length	Repeat	Comment
						Street Address^ Other Designation ^City^State^Zip or Postal Code^Country Code^^^Parish Code^^^^^
24.01	Street Address	RE	SAD			
24.01.01	Street or Mailing Address	RE	ST			
24.01.02	Street Name	RE	ST			
24.01.03	Dwelling Number	RE	ST			
24.02	Other Designation	RE	ST			
24.03	City	RE	ST			
24.04	State or Province	RE	ST			
24.05	Zip or Postal Code	RE	ST			
24.06	Country Code	RE	ID			
24.07	Address Type	X				
24.08	Other Geographic Designation	X				
24.09	County/Parish Code	X				
24.10	Census Tract	X				
24.11	Address Representation Code	X				
24.12	Address Validity Range	X				
24.13	Effective Date	X				
24.14	Expiration Date	X				
OBX.25	Performing Organization Medical Director	RE	XCN_ NG	3002	N	The name of the medical director of the performing site. Format:

Field	Name	Req'd	Type	Length	Repeat	Comment
						<i>ID Number^Last Name ^First Name^Middle Name^Suffix^ Prefix^^^^^^ Identifier Type Code^^^^^^ Professional Suffix^^</i>
25.01	ID Number	RE	XCN_ NG			
25.02	Family Name	RE	ST			
25.03	Given Name	RE	ST			
25.04	Second and Further Given Names or Initials Thereof	RE	ST			
25.05	Suffix (eg, <i>JR</i> or <i>III</i>)	RE	ST			
25.06	Prefix (eg, <i>DR</i>)	RE	ST			
25.07	Degree (e.g., MD)	X				
25.08	Source Table	X				
25.09	Assigning Authority	X				
25.10	Name Type Code	X				
25.11	Identifier Check Digit	X				
25.12	Check Digit Scheme	X				
25.13	Identifier Type Code	C	ID			This subfield is populated if OBX.25 (Performing Organization Medical Director) is populated. Possible values are: <ul style="list-style-type: none"> • NPI • DN
25.14	Assigning Facility	O	HD			An identifier of the performing site.

Field	Name	Req'd	Type	Length	Repeat	Comment
25.15	Name Representation Code	X				
25.16	Name Context	X				
25.17	Name Validity Range	X				
25.18	Name Assembly Order	X				
25.19	Effective Date	X				
25.20	Expiration Date	X				
25.21	Professional Suffix	O	ST			
25.22	Assigning Jurisdiction	X				
25.23	Assigning Agency or Department	X				

NTE—Notes and Comments segment

The Notes and Comments (NTE) segment is commonly used for sending notes and comments that accompany test result data. Depending on its position in the message, this segment may be associated with a PID, OBR, or OBX segment.

Field	Name	Req'd	Type	Length	Repeat	Comments
NTE.00	Segment Type ID	O	ST	4	N	This is NTE.
NTE.01	Set ID - NTE	R	SI	4	N	A sequential number that is used to group multiple NTE segments in a message.
NTE.02	Source of Comment	O	ID	8	N	The source of the comments. Valid values are: <ul style="list-style-type: none"> • L = Ancillary (filler) department • P = Orderer (placer) • O = Other system
NTE.03	Comment	R	FT	65536	Y	Comments that are contained in the segment.

Field	Name	Req'd	Type	Length	Repeat	Comments
						Quest places result values as well as units of measure and normal ranges in NTEs if this data is received from a reference lab.
NTE.04	Comment Type	X				

SPM—Specimen segment

The Specimen (SPM) segment is used to transmit information about a single specimen. The SPM segment contains information about the type of specimen the test was performed on and the date/time the specimen was received by the laboratory.

Field	Name	Req'd	Type	Length	Repeat	Comment
SPM.00	Segment Type ID	R	ST	4	N	This is SPM.
SPM.01	Set ID - SPM	R	SI	4	N	A sequential number that identifies SPM segments in messages that contain multiple SPM segments.
SPM.02	Specimen ID	O	EIP	80	N	A unique identifier for the specimen as referenced by the placer application, the filler application, or both.
02.01	Placer Assigned Identifier	O	EI			
02.02	Filler Assigned Identifier	O	EI			
SPM.03	Specimen Patient IDs	X				
SPM.04	Specimen Type	R	CWE_ CRE	250	N	The specimen type. If unknown, the following is reported: USPEC^Source, Unspecified^HL70487
04.01	Identifier	RE	ST			
04.02	Text	C	ST			
04.03	Name of Coding System	C	ID			

Field	Name	Req'd	Type	Length	Repeat	Comment
04.04	Alternate Identifier	X				
04.05	Alternate Text	X				
04.06	Name of Alternate Coding System	X				
04.07	Coding System Version ID	0	ST			
04.08	Alternate Coding System Version ID	X				
04.09	Original Text	X				
04.10	Second Alternate Identifier	X				
04.11	Second Alternate Text	X				
04.12	Second Name of Alternate Coding System	X				
04.13	Second Alternate Coding System Version ID	X				
04.14	Coding System OID	X				
04.15	Value Set OID	X				
04.16	Value Set Version ID	X				
04.17	Alternate Coding System OID	X				
04.18	Alternate Value Set OID	X				
04.19	Alternate Value Set Version ID	X				
04.20	Second Alternate Coding System OID	X				
04.21	Second Alternate Value Set OID	X				

Field	Name	Req'd	Type	Length	Repeat	Comment
04.22	Second Alternate Value Set Version ID	X				
SPM.05	Specimen Type Modifier	X				
SPM.06	Specimen Additives	X				
SPM.07	Specimen Collection Method	X				
SPM.08	Specimen Source Site	X				
SPM.09	Specimen Source Site Modifier	X				
SPM.10	Specimen Collection Site	X				
SPM.11	Specimen Role	X				
SPM.12	Specimen Collection Amount	O	CQ	20	N	
12.01	Quantity	O	NM			The numeric value of the specimen amount. For example, Total Urine Volume (TUV) results would have 1200/24 as a quantity.
12.02	Units	O	CE			
12.02.01	Identifier	O	ST			The unit of measure (eg, ml/dL).
12.02.02	Text	X				
12.02.03	Name of Coding System	X				
12.02.04	Alternate Identifier	X				
12.02.05	Alternate Text	X				
12.02.06	Name of Alternate Coding System	X				
SPM.13	Grouped Specimen Count	X				

Field	Name	Req'd	Type	Length	Repeat	Comment
SPM.14	Specimen Description	X				
SPM.15	Specimen Handling Code	X				
SPM.16	Specimen Risk Code	X				
SPM.17	Specimen Collection Date/Time	RE	DR	26	N	The specimen collection date/time.
17.01	Start Date	RE	TS_4			<p>The specimen collection date/time.</p> <p>This field is formatted as follows: <code>yyyymmddhhmm[ss[.s[s[s[s[s]]]]][+/-zzzz]</code></p> <p>Formatting requirements are as follows:</p> <ul style="list-style-type: none"> • <code>yyyy</code>: Required • <code>mm</code>: Conditional; required if <code>yyyy</code> is not 0000 • <code>dd</code>: Conditional; required if <code>yyyy</code> is not 0000 • <code>hh</code>: Conditional; required if <code>yyyy</code> is not 0000 • <code>mm</code>: Conditional; required if <code>yyyy</code> is not 0000 • <code>[ss[.s[s[s[s[s]]]]]</code>: Conditional; optional if <code>yyyy</code> is not 0000 • <code>[+/-zzzz]</code>: Optional
17.02	End Date	X				
SPM.18	Specimen Received Date/Time	O	TS	26	N	<p>The date/time the specimen was received at the diagnostic service site.</p> <p>This field is formatted as follows: <code>yyyy[mm][dd][hh][mm][ss[.s[s[s[s]]]]][+/-zzzz]</code></p>

Field	Name	Req'd	Type	Length	Repeat	Comment
						The year is required; all other parts are optional.
SPM.19	Specimen Expiration Date/Time	X				
SPM.20	Specimen Availability	X				
SPM.21	Specimen Reject Reason	X				
SPM.22	Specimen Quality	X				
SPM.23	Specimen Appropriateness	X				
SPM.24	Specimen Condition	X				
SPM.25	Specimen Current Quantity	X				
SPM.26	Number of Specimen Containers	X				
SPM.27	Container Type	X				
SPM.28	Container Condition	X				
SPM.29	Specimen Child Role	X				

Embedded PDF segments

Your Hub account must be configured to receive embedded PDFs; otherwise, the PDFs will be bundled with the HL7 results file. In addition, your Hub account configuration determines the type of PDFs—clinical (standard), enhanced, or both—that will be available.

ORC, OBR, and OBX segment groups for embedded PDFs

When PDFs are embedded in the result message, they appear in groups of ORC, OBR, and OBX segments (1 OBR segment for 1 ORC segment and 1 OBX segment for 1 OBR segment) at the end of the HL7 file. Both the OBR and OBX segments contain the PDF report label and description, but the OBX segment contains the actual PDF (in Base64-encoded format). The OBR and OBX segments for embedded PDFs are populated as follows:

- **OBR segment.** The following subfields are populated:
 - OBR.04.01 (*Identifier*) contains the report label (eg, *ClinicalPDFReport1*)
 - OBR.04.02 (*Text*) contains the report description in the following format: `Clinical PDF Report accession_number-#` (eg, *Clinical PDF Report EXAMPLE5418435-1*)
 - OBR.04.03 (*Name of Coding System*) contains the name of the coding system (eg, `99QDI`)
 - OBR.04.04 (*Alternate Identifier*) is blank
 - OBR.04.05 (*Alternate Text*) is blank
 - OBR.04.06 (*Alternate Name of Coding System*) is blank
- **OBX segment.** The following fields and subfields are populated:
 - OBX.02 (*Value Type*) contains `ED`, indicating embedded data
 - OBX.03 (*Observation Identifier*) contains the PDF report label (clinical or enhanced and PDF sequence number) and report description (clinical or enhanced plus accession number from OBR.03 of the first OBR segment in the result message plus PDF sequence number)
 - OBX.03.01 (*Identifier*) contains the report label (eg, *ClinicalPDFReport1*)
 - OBX.03.02 (*Text*) contains the report description in the following format: `Clinical PDF Report accession_number-#` (eg, *Clinical PDF Report EXAMPLE5418435-1*)
 - OBX.03.03 (*Name of Coding System*) contains the name of the coding system (eg, `99QDI`)
 - OBX.03.04 (*Alternate Identifier*) is blank
 - OBX.03.05 (*Alternate Text*) is blank
 - OBX.03.06 (*Alternate Name of Coding System*) is blank
 - OBX.05 (*Observation Value*) contains the ID of the lab sending the PDF and the actual PDF in Base64 encoding
 - OBX.05.01 (*Application ID*) contains the 3-character code for the Quest lab sending the PDF (same as MSH.04)
 - OBX.05.02 (*Object Type*) contains `IM`, indicating image
 - OBX.05.03 (*Format*) is blank
 - OBX.05.04 (*Encoding Type*) contains `Base64`
 - OBX.05.05 (*Observation Value*) contains the encoded PDF file. For information on decoding the PDF, see [“Decoding Base64 PDFs” on the next page](#)

Example format for embedded PDF segments

The sample format below uses placeholders to show the data that will be available in the ORC, OBR, OBX embedded PDF segments. Fields specific to embedded PDFs are in **bold text**, and the placeholder values are in *italic text*.

```
ORC|RE|EntityIdentifier^NamespaceID|EntityIdentifier^
NamespaceID||OrderStatus|||||IDNumber^LastName^
FirstName^^^^^^^^^IdentifierTypeCode|||||OrganizationName^^^^^^^^^
OrganizationIdentifier|StreetAddress^City^State^Zip^AddressType
OBR|SetID|PlacerOrderNumber|FillerOrderNumber|Identifier^Text^99QDI||
ObservationDate/Time |||||||ID Number^LastName^FirstName
^^^^^^^^^IdentifierTypeCode||||| ResultsRpt/StatusChng-Date/Time|||ResultStatus
OBX|SetID|ED|Identifier^Text^99QDI||ApplicationID^IM^Base64
^Base64EncodedData|||||F|||||PerformingOrganizationName^^^^^^FI^CLIA^^
OrganizationIdentifier|StreetAddress^OtherDesignation^City^State^Zip^CountryCode
^^^ParishCode|IDNumber^LastName^FirstName^MiddleName^Suffix^Prefix
^^^^^^IdentifierTypeCode^^^^^^ProfessionalSuffix
```

The following example for an enhanced PDF report assumes there are 2 OBR segments preceding the embedded PDF OBR segment. Thus, the embedded PDF OBR sequence number is 3. Fields specific to embedded PDFs are in **bold text**.

```
ORC|RE|A41749098^Quest_QAW_90002|EXAMPLE5418435^QUEST_QAW||CM|||||
1194871186^LastName^FirstName^^^^^^^^^NPI|||||TESTING ACCOUNT MU2 FOHA
^^^^^^^^^90002| StreetAddress^City^State^Zip^O
OBR|3|A41749098^Quest_QAW_90002|EXAMPLE5418435^QUEST_QAW|EnhancedPDFReport1^Enhanced
PDF Report EXAMPLE5418435-2^99QDI|||1205010000.0000800|||||
1194871186^LastName^FirstName^^^^^^^^^NPI|||||20240122172707.000-0000|||F
OBX|1|ED|EnhancedPDFReport1^Enhanced PDF Report EXAMPLE5418435-2^99QDI||QAW^IM^^
Base64^JVBERi0xLjMKJaqrRk0KNCAwIG9iago8PCAvVHlwZSAvSW5mbwovUHJvZHVjZXIgc
KG51bGwplID4+CmVuZG9iago2IDAgb2JqCjw8IC9MZW5ndGggMjA2NyAvRmlsdGVyIFsgIC9Gb
GF0ZURlY29kZSBdCiA+PgpzdhJlYW0KSklpWk87TnKdzxa+fVaryzeArpEwnrLJnKoIgNO6s
azWkkvEzW9WSn+ZfChBNzJv9fwxJo3qcSmjR7cY6MK5BXinmFn9RPoMEJ6Qk+vbGtWlx9CRs
5OGfyn6pBOIn/4uyMYzKBEf/. . . Base64 content truncated|||||F|||||
Quest Diagnostics^^^^^^FI^CLIA^^29D0652720|4230 Burnham Ave.
^^Las Vegas^NV^89119| ^LastName^FirstName^MiddleName^^^^^^^^^01
```

Decoding Base64 PDFs

Base64 encoding translates binary data such as PDFs into text. This encoding is necessary when PDFs must be transferred in HL7 or XML, which are both text formats. For an example of the embedded PDF segments and the Base64 encoding, see [“Example format for embedded PDF segments”](#) above.

To decode the encoded PDF back to binary format, do the following:

- 1 Extract the Base64-encoded data from the HL7 message.
- 2 Decode the Base64 data into binary data using whatever tool you use for development (eg, Java and .NET both have libraries that convert Base64-encoded data into binary data).
- 3 Save/process the binary data for your EMR system using a PDF tool such as Adobe Acrobat or Ghostscript.

Glossary

Account ID

A unique identifier for a care site that uses Quest Diagnostics laboratory services. This is the identifier used by Quest for billing each care site.

Acknowledgment (ACK)

A message indicating that an action, such as downloading a lab result, has successfully been accomplished. See *also* [Negative Acknowledgment \(NAK\)](#).

Advanced Beneficiary Notice (ABN)

A PDF form that notifies a patient when Medicare will not cover the costs of the ordered tests, based on an evaluation of the submitted CPT and ICD codes.

Clinical Data Compendium (CDC)

A current collection of all reference data—for example, test codes, diagnosis codes, and Ask at Order Entry (AOE) questions—needed to create a complete and valid electronic order for submission to a Quest or to a third-party laboratory system.

EHR-Lab Interoperability and Connectivity Specification (ELINCS)

A messaging specification intended to standardize the electronic reporting of test results from clinical laboratories to electronic health record (EHR) systems. It is specific to the U.S. Realm and based on the 2.5.1 version of HL7, but includes additional constraints.

Electronic Exchange of Directory of Services (eDOS)

The *Laboratory Test Compendium Framework* for delivering order codes to systems that support electronic laboratory ordering and/or resulting functionality. The *Laboratory Test Compendium Framework* is a laboratory's Directory of Services (DOS). For eDOS, the DOS is supplied in HL7 2.6 format.

Electronic Health Record (EHR)

The Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports. The EHR automates and streamlines the clinician's workflow. The EHR has the ability to generate a complete record of a clinical patient encounter—as well as supporting other care-related activities directly or indirectly via interface—including evidence-based decision support, quality management, and outcomes reporting.

Electronic Medical Record (EMR)

Technology that meets provider needs for real-time data access and evaluation in medical care. In concert with clinical workstations and clinical data repository technologies, the EMR provides the means for longitudinal data storage and access. The result will be increased efficiency, reduced cost, and improved quality of care.

Health Level Seven (HL7)

A data interchange transaction protocol for healthcare technology applications that simplifies the ability of different vendor-supplied IS systems to assure interoperability. Although not a software program in itself, HL7 requires that each healthcare software vendor program supports HL7 interfaces for its products.

Hospital Information System (HIS)

The common term for the computer hardware and software that provides the support of the hospital.

Quantum Hub Account

A unique account that enables an authorized external system (for example, EMR vendor) to interact with the Quantum Hub.

Interface

The code written and the specifications and protocols used for the transmission of electronic data between the Quantum Hub and the participants' and/or vendors' computing environments.

Logical Observation Identifiers Names and Codes (LOINC)

An industry database that is used to facilitate the exchange of pooling results for clinical care, outcomes management and research. LOINC codes are universal identifiers for laboratory and other clinical observations.

Negative Acknowledgment (NAK)

A message indicating that an action, such as downloading a lab result, was not successfully accomplished. See *also* [Acknowledgment \(ACK\)](#).

Practice Management System (PMS)

A category of healthcare software that deals with the day-to-day operations of a medical practice. Such software frequently allows users to capture patient demographics, schedule appointments, maintain lists of insurance payers, perform billing tasks, and generate reports.

Provider

An organization that provides information or data to the Quantum Hub. Organizations can include reference labs, esoteric labs, hospitals, payers, radiology clinics, clearinghouses, pharmacies, or Pharmacy Benefit Managers (PBMs). Also referred to as *service provider*.

Provider Account

An organization that uses the services of a provider, such as a physician's office, an Independent Physician Association (IPA), a clinic, or a hospital. The provider account uniquely defines the organization, allowing accurate distribution of data to an authorized entity.

Request ID

A unique identifier that references a specific transaction made by an EMR system and received by the Quantum Hub. This identifier is assigned to a request upon receipt of the request message. The Request ID is unique across all Quantum Hub accounts.

SOAP

An XML-based protocol for exchanging information in a decentralized, distributed environment. It provides an envelope that defines a framework for describing what is in a message and how to process it, encoding rules for expressing application-defined datatypes, and a convention for representing remote procedure calls and responses.

Test In Question (TIQ)

A test that was not completed because insufficient information was available (for example, if the physician sent 2 specimens but ordered only 1 test).

Test Not Performed (TNP)

A test that was not performed because it was canceled or because it was not possible for the lab to perform the test (for example, if the amount of specimen collected was not sufficient or viable).

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