



HL7 Interface Specifications

May 15

2023

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Endosoft HL7 Interface Specification Dated 05/15/2023

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This document contains a description of the HL7 interface that Endosoft currently supports, using the HL7 protocol standard in communicating with Hospital Information System (HIS) for the purpose of exchanging health care data. This interface specification is subject to modification and/or revision to incorporate changes, improvement, and enhancements.

Contact ENDOSOFT for any information regarding interface support for new messages, features that may have been added to the interfaces, but not yet documented in these specifications.

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General Specifications

Standard (Preferred) Interface Specifications

Connectivity: Network

Protocol: TCP/IP sockets (using Minimum Lower Layer Protocol)

Record
format: HL7 Version 2.2 or 2.3 or 2.5

Methods and
examples: Send/Receive real-time, individual messages with acknowledgement of each message received before next message is sent. Supported messages include those for ADT, outbound billing/charges/results, and inbound Scheduling.

Typically one socket/port number is dedicated to messages being sent in the same direction (i.e., inbound/outbound) and to/from the same IP address (e.g., typically the same vendor).

Acknowledgements for received messages are transmitted back on the same socket/port they were received on.

For example, at one facility, incoming ADT and incoming order/Scheduling messages from the same vendor could share one socket, while outgoing billing/charges/results messages to that vendor (i.e., an IP address) would use a second socket.

Other options ADT/

SCHEDULING Batch file (if TCP/IP protocol cannot be used as above)

Record format: HL7 version 2.2 or 2.3 or 2.5 "batch file" for possible but less desirable mat preferred; custom formats Method: Batch file creation on network drive or external drive

Standard Incoming or Outgoing Message Types

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ADT (patient data):

Admit, transfer, discharge, update, cancel admit, pre-admit, outpatient registration, outpatient pre-registration, outpatient discharge, cancel discharge, inpatient-to-outpatient and outpatient to inpatient status change, swap patients (beds), change Id (billing account number), and change patient ID (medical record number).

Orders/profile: New order, discontinue order, hold order, cancel hold, update order.

Billing: CPT and ICD Codes(e.g., typically sent to other financial or accounting systems)

Our standard interface uses typical HL7 Version 2.2 or 2.3 or 2.5 records, messages, fields, definitions and processing rules. This document will detail how we use HL7, particularly which messages are used and which fields are required/optional.

The remaining documentation is organized as follows:

- General HL7 definitions and rules, as implemented by our standard interfaces
- HL7 Messages and their segment combinations, as supported by our standard interfaces
- Detailed information about each support segment, including field descriptions and requirements

General HL7 Definitions and Rules

Sending and Receiving Systems; Inbound and Outbound Messages

In this document, the system transmitting a message may be referred to as the "sender" or "sending/pitcher/pitching" system and the system receiving and acknowledging the message as the "receiver" or "receiving/catcher/catching" system. Messages sent by an ENDOSOFT interface may be referred to as "outbound" messages and those being received by an ENDOSOFT interface may be referred to as "inbound" messages. Therefore, the terms "inbound" and "outbound" will refer to the direction of message travel from ENDOSOFT's perspective.

HL7 Messages

A "message" is considered the minimal unit of data transferred between systems using HL7. For example, an admission transaction would be sent as an HL7 "ADT" message. Messages are comprised of two or more "segments" that act as building blocks for each message.

Messages are delimited by a "start block" (HEX 0b ...or...

ASCII / decimal 11) and an "end block" (HEX 1c plus HEX 0d ...or....

ASCII/decimal 28 plus ASCII/decimal 13). Also, see that each segment is terminated by an 0x0D (13) character.

Conceptual example: <Hex 0b><HL7 Message segments><Hex 1c><Hex 0d> HL7 Segments

HL7 messages are comprised of several HL7 segments. Examples of segments include: the "message header segment", "patient identification segment", "Patient

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visit segment" and "financial transaction segment" segments, among many others. Each message is terminated by Hex 0d (decimal 13; the "carriage return" character).

Conceptual example: <Hex 0b>
 <Message header segment><Hex 0d>
 <Event segment><Hex 0d>
 <Patient Id segment><Hex 0d>
 <Patient visit segment><Hex 0d>
 <Diagnosis segment><Hex 0d>
 <Allergy segment><Hex 0d>
 <Hex 1c><Hex 0d>

Optional segments and fields will be enclosed in brackets [] e.g., [AL1] indicates that the allergy segment is optional. Some segments may, on an optional basis, be repeated within the message. Repeating message options will be displayed with curly brackets { }. For example, {AL1} indicates that the allergy segment may be repeated if needed. These may also be combined, e.g., [{AL1}] indicates the allergy segment is optional **and** that it may be repeated if needed.

Some of the messages outlined below do not list all possible standard HL7 segments. These "unlisted" segments can be included within inbound HL7 messages, but will be ignored by the ENDOSOFT interface. Unlisted segments are assumed to be optional, and will not be included in outbound transactions unless the vendor contacts ENDOSOFT to make other arrangements.

Fields

Each segment begins with a unique 3-byte message identifier field (e.g., MSH for "message header", PID for "patient identification", etc.). Subsequent fields within the same segment are separated from one another by the field separator character, the "pipe" symbol, "|".

e.g., PID|field2|field3|field4|.....etc.|<Hex 0d>

Fields are transmitted as character strings. Refer to the "Data Types" table below for a listing of the types of data found in the fields. Although field lengths are listed in the message and segment definition tables below, the interface will not "pad" the field with spaces when sending messages. Although the interface can receive fields padded with spaces, the sending system is **not** required to pad fields with spaces. If fields are blank (e.g., PID|)| i.e., field separators with nothing between them) then the sender has no new value for these fields and any previous values in the receiver's system should be left "as is". If the sender transmits two double quote marks as a field value (e.g., |""|), this null value should signal the receiving system to remove any previously held value. If all remaining fields in a segment have no data (and are all optional), the sending system may drop them and terminate the segment at that point. The receiving system should treat dropped fields as blank.

Field Components and Subcomponents

A few HL7 fields are defined as having more than one portion, each of which is separated by a component separator, "^". These field types are called "composite" fields. For example, the patient's name field is usually sent as several components:

"....|last_name^first_name^initial^^|...."

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Blank components are shown with two component separators with nothing between them: "^". If all remaining components in a field definition have no data and are optional, the sending system may drop them. The receiving system should treat dropped components as blank.

Occasionally, components may be divided into subcomponents, separated by the subcomponent separator, "&". Rules for their use are similar to those for the component separator.

The interface will usually not further subdivide fields below the "component" level unless otherwise noted. However, refer to standard HL7 documentation for standard subcomponent (and below) definitions if desired.

Data Types

The Data Type Category will appear in subsequent field definition tables to identify the format of the field or its components.

Composites

- ☐ **ST** -- String
- ☐ **EI** -- Entity Identifier
- ☐ **IS** -- Coded value for user-defined tables
- ☐ **ID** -- Coded values for HL7 tables
- ☐ **TS** -- Time stamp
- ☐ **CM_MSH** -- MSH Event-Type Composite
- ☐ **PT** -- Processing Type
- ☐ **NM** -- Numeric
- ☐ **CE** -- Coded Element
- ☐ **XCN** -- Extended composite ID number and name
- ☐ **HD** -- Hierarchic Designator
- ☐ **SI** -- Sequence ID
- ☐ **CX** -- Extended composite ID with check digit
- ☐ **XP** -- Extended person name
- ☐ **XAD** -- Extended Address
- ☐ **XTN** -- Extended telecommunications number
- ☐ **DLN** -- Driver's License Number
- ☐ **DT** -- Date
- ☐ **XON** -- Extended composite name and ID number
- ☐ **JCC** -- Job code/class
- ☐ **PL** -- Person location
- ☐ **FC** -- Financial class
- ☐ **CM** -- Composite - discouraged
- ☐ **CP** -- Composite Price
- ☐ **MO** -- Money
- ☐ **TQ** -- Timing/quantity
- ☐ **CQ** -- Composite Quantity with Units
- ☐ **TX** -- Text data
- ☐ **FT** -- Formatted text
- ☐ **Diagnosis Code** -- Coding

Field Requirements

In this documentation, fields will be marked as follows:

R = required,
O= Optional,
C = Conditional (if used, these will be explained) and
B = included for backwards compatibility with previous versions.

Unlisted standard HL7 fields are to be considered optional.

Receiver Processing Rules

The receiver should ignore any "extra" segments, fields, components, and subcomponents (i.e., that were transmitted but were not expected by the receiving system). The receiver should treat segments that were expected, but not present, as consisting entirely of fields that are blank. The receiver should treat fields, components and subcomponents that are expected, but not included in a segment, as blank.

The receiver should send one "ACK" (acknowledgement) message to the sender, following receipt of each message, as follows. After the receiver has received a properly delimited message, the receiver should process the message. If the receiver is unable to process the message because of improper message format, missing required field data, or the like, the receiver should send back an HL7 acknowledgement message (ACK) containing an MSA segment, with field #1 containing the value "AE" (application error).

HL7 Messages Supported by Our Standard Interfaces

Admission Messages

The "ADT" message type will be used for admission/patient demographic information from the hospital system to the ENDOSOFT database. Several (incoming) admission events are supported by the interface. Many admission messages share the same message format. When a subsequent message shares the same segment combinations as a previous one, the user will be directed to refer to the earlier message for more detail. The "trigger event" or "event" code (e.g., A01 = admit) found in the Message Header Segment and in the Event Segment define the type of admission message (admission, transfer, discharge, etc.). These will be discussed in the "HL7 Message Segment Detail" section of this documentation.

ADT - Admit a patient (A01)

An "admit patient" message (A01 "event") is used for "Admitted" patients only. These messages are sent as a result of patients beginning their stay in the healthcare facility. Normally, this information is entered in the hospital information system and broadcast to nursing units and ancillary systems. A admission message (A01 event) should be used to notify the ENDOSOFT database of a patient's arrival in the healthcare facility.

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Segment	Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit

ADT - Transfer a Patient (A02)

A "transfer patient" message (A02 event) should be sent to the interface when a patient is transferred to another ward, room or bed.

Segment	Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit

ADT - Discharge/End Visit (A03)

A "discharge patient" or "end visit" message (A03 event) should be sent when an inpatient's stay in the healthcare facility is ended, or an outpatient or emergency room visit is ended. It signals that the patient's status has changed to "discharged", that a discharge date/time has been assigned, and that the patient no longer requires services normally provided through the pharmacy database.

Segment	Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit

ADT - Register an Outpatient/ER Patient (A04)

A "register patient" message (A04 event) signals that the patient has arrived or checked in as an outpatient, recurring outpatient, or emergency room patient. Note: Users may be able to configure their system to process, or not process (ignore), some (or all) outpatient and emergency room registrations; in either case an "application accept" acknowledgement will be returned to the sender. This message uses the same segments as the "admit patient" (A01) message.

ADT - Pre-admit a Patient (A05)

A "pre-admission" message (A05 event) is sent to notify the interface of a patient pre-admission process. This message can also be used to pre-register an outpatient or emergency room patient. Note: Users may be able to configure their system to

process, or not process (ignore), this message type; in either case an "application accept" acknowledgement will be returned to the sender.

This message uses the same segments as the "admit patient" (A01) message.

ADT - Change an Outpatient to an Inpatient (A06)

A "change outpatient to inpatient" message (A06 event) is sent when an outpatient or ER patient is being admitted as an inpatient. This message should signal the interface to change a patient's status from outpatient/ER to inpatient/admitted. If a patient is **pre**-registered (not registered) as an outpatient and then admitted as an inpatient, an "admission" message (A01 event) should be sent instead.

This message uses the same segments as the "admit patient" (A01) message.

ADT - Change an Inpatient to an Outpatient (A07)

A "change inpatient to outpatient" message (A07 event) is sent when an inpatient becomes an outpatient and is still receiving care/services.

This message uses the same segments as the "admit patient" (A01) message.

ADT - Update Patient Information (A08)

This message (A08 event) is used when any patient information has changed but when no other ADT event has occurred. For example, visit information updates. This message uses the same segments as the "admit patient" (A01) message.

ADT - Cancel Admission (A11)

For inpatients, the "cancel admission" message (A11 event) is sent when an earlier "admission" message (A01 event) is canceled, either because of an erroneous entry or because of a revised decision to not admit the patient. For outpatients/ER patients, the message is sent when an earlier "register outpatient" message (A04 event) is canceled for similar reasons. If the patient has orders on file, the patient will be discharged by the application. If no orders are on file, the patient's record will be deleted.

This message uses the same segments as the "discharge patient" (A03) message.

ADT - Cancel Transfer (A12)

The "cancel transfer" message (A12 event) is intended to reverse an earlier "transfer" message, either because of an erroneous entry or because of a revised decision to not transfer the patient. This message uses the same segments as the "transfer patient" (A02) message and, for inbound messages, is treated as a second transfer.

ADT - Cancel Discharge (A13)

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The "cancel discharge" message (A13 event) is sent when an earlier "discharge patient" message (A03 event) is canceled, either because of erroneous entry or because of a revised decision to not discharge, or end the visit of, the patient. This message uses the same segments as the "admit patient" (A01) message.

ADT - Swap Patients (A17)

The "swap patients" message (A17 event) is used to identify two patients that have exchanged beds. The interface will process inbound A17 events, but does not support this event for outbound messages.

Segment	Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification (patient #1)
PV1	Patient Visit (patient #1)
PID	Patient Identification (patient #2)
PV1	Patient Visit (patient #2)

ADT - Merge Records (A18)

For inbound messages, the "merge records" message (A18 event) is used to combine two patient records into one. This may be used if a second, unwanted record for the same patient has been created accidentally by the other system. The interface does not support A18 events for outbound messages. [Note: To update patient medical record numbers, the interface sends outbound A36 event messages; to update patient account number, outbound A35 event messages are sent.]

Segment	Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
MRG	Merge Information
PV1	Patient Visit

ADT - Delete Record (A23)

The "delete record" message (A23 event) is recognized by the interface for inbound messages and processed in the same manner as a "cancel admission" (A11 event) message. The "delete record" (A23) event is not supported for outbound ADT messages.

This message uses the same segments as the "discharge patient" (A03) message.

ADT - Update Person (A31)

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The "update person" message (A31 event) is recognized by the interface for inbound messages and processed in the same manner as a "update patient information" (A08 event) message.

Segment	Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit

ADT - Change Patient Account Number (A35)

The "change account number" (A35 event) is used to update the patient's account number. This might be used if a patient record is entered with an incorrect account number.

Segment	Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
MRG	Merge Information

ADT - Change Medical Record No and Account No (A36)

The "change medical record no and account no" (A36 event) may be used to update the patient's medical record number and/or account number. This message uses that same segments as the "change patient account number"

ADT - Merge two Patients based on internal patient id (A40 event)

Segment	Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
MRG	Merge Information

Financial Messages (Out Bound)

The DFT (Detailed Financial Transaction) message type is used to transmit charges from Endosoft to (hospital) financial system

DFT - Detailed Financial Transaction message

Segment	Description
---------	-------------

MSH	Message Header
{EVN}	Event Type
PID	Patient Identification
{PV1}	Patient Visit
[FT1]	Financial Transaction

HL7 Message Segment Detail

In this section of the documentation, we will detail the various HL7 segments that may be combined to form the messages supported by the interface. The section documents the fields that make up each of the message segments, and field requirements. Some detailed information will be provided regarding required fields, but optional fields will not usually be explained in detail. Fields that are listed in a table but not described/defined following the table, are not supported or used by the interface at this time.

The start block and end block characters that delimit each message (as discussed earlier) will not be included in the message descriptions below, but are nevertheless required for working interfaces. In addition, the carriage return character that terminates each segment will also not be included in the descriptions, but are also required for working interfaces.

Segment ID

Each segment must be preceded with an appropriate, unique 3 byte segment identifier (Segment ID). Although not treated as (or sequentially counted as) an official HL7 field, the segment ID is listed first in each of the following segment definition tables for easier reference.

MSH - Message Header Segment

The MSH segment is required for all messages and will always be the first Segment in the message. Thus every message will have at least two segments.

	Name	DataType	Required
1	Field Separator	ST	YES
2	Encoding Characters	ST	YES
3	Sending Application	EI	<input type="checkbox"/>
4	Sending Facility	EI	<input type="checkbox"/>
5	Receiving Application	EI	<input type="checkbox"/>
6	Receiving Facility	EI	<input type="checkbox"/>
7	Date/Time of Message	DT	<input type="checkbox"/>
8	Security	ST	<input type="checkbox"/>
9	Message Type		
10	Message Control ID		YES
11	Processing ID	PT	
12	Version ID	ID	YES
13	Sequence Number	NM	

14	Continuation Pointer	ST	
15	Accept Acknowledgement Type	ID	
16	Application Acknowledgement Type	ID	
17	Country Code	ID	
18	Character Set	ID	
19	Principal Language of Message	CE	

Field separator

This field contains the separator between the segment ID and the first real field. It serves as the separator and defines the character to be used as a field separator for the rest of the message. The interface will always use "|" (ASCII/decimal 124).

Encoding characters

This field contains four characters in the following order: the component separator, repetition separator, escape character, and subcomponent separator. The interface uses "^~\&" respectively.

Sending application

This field defines which application sent the message. For messages sent by our standard interfaces, this will be "ENDOSOFT". For messages received by the interfaces, this field should be the other application's ID.

Sending facility

This field defines which facility sent the message. For messages sent by the our interface, this will be user defined and unique to each installation. The other application should use the same "sending facility" ID to send messages to the interface. The "sending" and "receiving" facility should be the same.

Receiving application

This field uniquely identifies the receiving application among all other applications on the network. The other application vendor should define this.

Receiving facility

This field should be the same as the "Sending facility" (above).

Date/time of message

This field contains the date/time that the message was created in the date/time format: YYYYMMDDHHMM [SS]. The "seconds" portion is optional.

Message type

This is a composite field which includes 2 components: <message type> ^ <trigger event>

Message types are always 3 bytes and are required components. The message types used by the interface include:

ACK	General acknowledgment
ADT	ADT message (patient admission, discharge, transfer, and etc.)
DFT	Detailed financial transaction (billing transaction) *

Trigger events are always 3 bytes. Trigger event codes also appear in the EVN (event) segment which is used to process many ADT messages. Recognized trigger events include:

Trigger Event Types

A01	Admit a patient
A02	Transfer a patient
A03	Discharge a patient
A04	Register an Outpatient
A05	Preadmit a patient
A06	Change an Outpatient to Inpatient
A07	Inpatient to outpatient "transfer"
A08	Update patient information
A11	Cancel admission
A12	Cancel transfer
A13	Cancel discharge
A17	Swap patients
A23	Delete a patient record
A36	Medical record number change
A40	Merge two Patients based on internal patient id

Message control ID

This field contains a value that uniquely identifies the message. The receiving system should echo this ID back to the sending system in the ACK message's MSA segment. If a message is re-sent for any reason, the message control id will remain the same for each transmission of the identical message.

Processing ID
P = Production

Version ID

This is the HL7 version number in use. The interface will use version "2.3" or 2.5 in this field

MSA - message acknowledgment segment

The MSA segment is part of the "ACK" message type and is used to acknowledge a previously received message.

Seq	Len	Fmt	Opt	Element Name
0	3		R	Segment ID = "MSH"
1	2	ID	R	Acknowledgment Code
2	20	ST	R	Message Control ID
3	80	ST	O	Text Message
4	15	NM	O	Expected Sequence Number
5	1	ID	O	Delayed Acknowledgment Type
6	100	CE	O	Error Condition

Acknowledgment code

AA	Application Accept
AE	Application Error

Message control ID

This field contains the same message control ID that was in the message created by the sending system. It allows the sending system to match the response to the original message.

Text message

This optional field further describes an error condition.

Admissions Message Segments

PID - patient identification segment

The PID segment contains information about the patient, and is used to specifically identify the patient in the Endosoft database.

PID -- Patient Identification

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1	Set ID - PID	SI	<input type="checkbox"/>
2	Patient ID (External ID)	CX	<input type="checkbox"/>
3	Patient ID (Internal ID)	CX	<input type="checkbox"/>
4	Alternate Patient ID - PID	CX	<input type="checkbox"/>
5	Patient Name	XPN	<input type="checkbox"/>
6	Mother's Maiden Name	XPN	<input type="checkbox"/>
7	Date/Time of Birth	DT	<input type="checkbox"/>
8	Sex	IS	<input type="checkbox"/>
9	Patient Alias	XPN	<input type="checkbox"/>
10	Race	IS	<input type="checkbox"/>
11	Patient Address	XAD	<input type="checkbox"/>
12	County Code	IS	<input type="checkbox"/>
13	Phone Number - Home	XTN	<input type="checkbox"/>
14	Phone Number - Business	XTN	<input type="checkbox"/>
15	Primary Language	CE	<input type="checkbox"/>
16	Marital Status	IS	<input type="checkbox"/>
17	Religion	IS	<input type="checkbox"/>
18	Patient Account Number	CX	<input type="checkbox"/>
19	SSN Number - Patient	ST	<input type="checkbox"/>
20	Driver's License Number-Patient	DLN	<input type="checkbox"/>
21	Mother's Identifier	CX	<input type="checkbox"/>
22	Ethnic Group	IS	<input type="checkbox"/>
23	Birth Place	ST	<input type="checkbox"/>
24	Multiple Birth Indicator	ID	<input type="checkbox"/>
25	Birth Order	NM	<input type="checkbox"/>
26	Citizenship	IS	<input type="checkbox"/>
27	Veterans Military Status	CE	<input type="checkbox"/>
28	Nationality	CE	<input type="checkbox"/>
29	Patient Death Date and Time	TS	<input type="checkbox"/>
30	Patient Death Indicator	ID	<input type="checkbox"/>

Patient ID (Internal ID)

This field should contain the patient's medical record number. This number should be the same each time the same patient is admitted/registered and is a required field in ENDOSOFT database. The interface will use this field a secondary identifier for the most recent admission (patient account number, field sequence #18, will be the primary identifier - see below). This field could be used by the interface to locate previous admission/order data for the patient.

Patient name

This field contains one or more components. Family name and Given name is required field. The last two components (suffix and prefix) are not used by the interface and will be ignored.

<family name (20)> ^ <given name (12)> ^ <middle initial or name> ^ <suffix> ^ <prefix>

Date/Time of birth

This field contains the patient's date of birth (YYYYMMDD). DateOfBirth is a required field.

Patient address

Although this field is optional, it is highly desirable for outpatient registrations/admissions. The field components and subcomponents include:
<street address> ^ <2nd street address line> ^ <city> ^ <state> ^ <zip/postal code> ^ <country> ^ \

Phone number – home

Although this field is optional, it is highly desirable for outpatient registrations/admissions. The area code is required. Format: Components: 9999999999

Patient account number

This field contains the unique patient account number assigned by the hospital for each admission/registration. If the same patient is admitted/registered again, the number should be different each time.

EVN - event type segment

The EVN segment specifies the type of event contained within the message. Not all HL7 messages will include the EVN.

	Name	Data Type	Required
1	Event Type Code	ID	<input type="checkbox"/>
2	Recorded Date/Time	TS	YES
3	Date/Time Planned Event	TS	
4	Event Reason Code	IS	<input type="checkbox"/>
5	Operator ID	XCN	<input type="checkbox"/>
6	Event Occurred	TS	<input type="checkbox"/>

Event type code

This field indicates the specific type of message. It is most commonly used to send ADT messages to the interface. This field will contain the same data as the "trigger event" (i.e., the second component of the MSH segment's "message type" field). Refer to the event table listed in the MSH-"message type" section above.

Recorded date/time

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This contains the date and time that the event was triggered on the hospital system. The interface will recognize formats: YYYYMMDDHHMMSS

MRG -- Merge Patient Information

	Name	Data Type	Required
1	Prior Patient ID - Internal	CX	<input type="checkbox"/>
2	Prior Alternate Patient ID	CX	<input type="checkbox"/>
3	Prior Patient Account Number	CX	<input type="checkbox"/>
4	Prior Patient ID - External	CX	<input type="checkbox"/>
5	Prior Visit Number	CX	<input type="checkbox"/>
6	Prior Alternate Visit ID	CX	<input type="checkbox"/>

PV1 - patient visit segment

The PV1 segment is used to convey additional information about the patient's admission/registration that is unique to this visit. This segment can also be used to schedule an appointment in ENDOSOFT

	Name	Data Type	Required
1	Set ID - PV1	SI	
2	Patient Class	IS	
3	Assigned Patient Location	PL	
4	Admission Type	IS	
5	Preadmit Number	CX	
6	Prior Patient Location	PL	
7	Attending Doctor	XCN	YES (for scheduling)
8	Referring Doctor	XCN	
9	Consulting Doctor	XCN	
10	Hospital Service	IS	YES (for scheduling)
11	Temporary Location	PL	
12	Preadmit Test Indicator	IS	YES (for scheduling)
13	Readmission Indicator	IS	
14	Admit Source	IS	
15	Ambulatory Status	IS	
16	VIP Indicator	IS	
17	Admitting Doctor	XCN	
18	Patient Type	IS	
19	Visit Number	CX	
20	Financial Class	FC	
21	Charge Price Indicator	IS	
22	Courtesy Code	IS	
23	Credit Rating	IS	
24	Contract Code	IS	
25	Contract Effective Date	DT	
26	Contract Amount	NM	
27	Contract Period	NM	

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28	Interest Code	IS	
29	Transfer to Bad Debt Code	IS	
30	Transfer to Bad Debt Date	DT	
31	Bad Debt Agency Code	IS	
32	Bad Debt Transfer Amount	NM	
33	Bad Debt Recovery Amount	NM	
34	Delete Account Indicator	IS	
35	Delete Account Date	DT	
36	Discharge Disposition	IS	
37	Discharged to Location	CM	
38	Diet Type	IS	
39	Servicing Facility	IS	
40	Bed Status	IS	
41	Account Status	IS	
42	Pending Location	PL	
43	Prior Temporary Location	PL	
44	Admit Date/Time	TS	YES (for scheduling)
45	Discharge Date/Time	TS	
46	Current Patient Balance	NM	
47	Total Charges	NM	
48	Total Adjustments	NM	
49	Total Payments	NM	
50	Alternate Visit ID	CX	
51	Visit Indicator	IS	
52	Other Healthcare Provider	XCN	

Patient class

Field values:

E	Emergency
I	Inpatient
O	Outpatient
P	Pre-Admit

Assigned patient location

This field identifies the current location of the patient. Components: <unit> ^ <room> > ^ <bed>

The first component may be the nursing station or ward. This field should normally be provided for inpatient admissions. The interface may be optionally configured to map certain patient classes or patient types to a pre-defined location, if the hospital/pharmacy system does not provide a location (e.g., map outpatients to a room called "OUTPAT", emergency room patients to "ER", etc.)

Prior patient location

For transfers, this field contains the patient's prior location. Components: <unit> ^ <room> > ^ <bed>

Attending doctor

This field contains the attending doctor's data.

Components: <ID number> ^ <family name> ^ <given name> ^ <middle initial> ^ ^ ^ <degree>

Admitting doctor

This field contains the admitting doctor's data.

Components: <ID number> ^ <family name> ^ <given name> ^ <middle initial> ^ ^ ^ <degree>

Patient type

This field will be used to pass hospital specific patient types to the interface. For example, if the patient class is "O" (outpatient),

AL1 - Patient Allergy Information(Optional)

The AL1 segment is used to transmit one patient Allergies to the interface. Additional AL1 segments are sent for separate Allergies.

	Name	Data Type	Required
1	Set ID - AL1	SI	<input type="checkbox"/>
2	Allergy Type	IS	<input type="checkbox"/>
3	Allergy Code/Mnemonic/ Description	CE	<input type="checkbox"/>
4	Allergy Severity	IS	<input type="checkbox"/>
5	Allergy Reaction	ST	<input type="checkbox"/>
6	Identification Date	DT	<input type="checkbox"/>

Allergy Type

This field contains the allergy type for the patient.

Allergy Description

This field describes the allergy.

DG1 - diagnosis segment (Optional)

The DG1 segment is used to transmit one patient diagnosis to the interface.

Additional DG1 segments are sent for separate diagnoses. If there is a new diagnosis, or a change in any of the diagnoses, they should all be resent to the interface.

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	Name	Data Type	Required
1	Set ID - DG1	SI	<input type="checkbox"/>
2	Diagnosis Coding Method	ID	<input type="checkbox"/>
3	Diagnosis Code	Diagnosis Code	<input type="checkbox"/>
4	Diagnosis Description	ST	<input type="checkbox"/>
5	Diagnosis Date/Time	TS	<input type="checkbox"/>
6	Diagnosis Type	IS	<input type="checkbox"/>
7	Major Diagnostic Category	CE	<input type="checkbox"/>
8	Diagnostic Related Group	CE	<input type="checkbox"/>
9	DRG Approval Indicator	ID	<input type="checkbox"/>
10	DRG Grouper Review Code	IS	<input type="checkbox"/>
11	Outlier Type	CE	<input type="checkbox"/>
12	Outlier Days	NM	<input type="checkbox"/>
13	Outlier Cost	CP	<input type="checkbox"/>
14	Grouper Version and Type	ST	<input type="checkbox"/>
15	Diagnosis Priority	NM	<input type="checkbox"/>
16	Diagnosing Clinician	XCN	<input type="checkbox"/>
17	Diagnosis Classification	IS	<input type="checkbox"/>
18	Confidential Indicator	ID	<input type="checkbox"/>
19	Attestation Date/Time	TS	<input type="checkbox"/>

Diagnosis coding method

ICD9 is the only valid coding system supported by the interface. This field should contain "I9" if the diagnosis is an ICD9 coded diagnosis. Otherwise, the field should be omitted. **Diagnosis code**

If the ICD9 code is available, it should be placed here.

IN1 - Insurance Segment (IN1)

The IN1 segment contains insurance policy coverage information necessary to produce properly pro-rated patient and insurance bills. If Insurance information is available for a patient, it should be present in IN1 segment. IN1 segment can be repeating segment if patient has more than one insurance policy.

IN1 Fields

Name	Data Type	Required
IN1-1	SI	
IN1-2	CE	
IN1-3	CX	
IN1-4	XON	
IN1-5	XAD	
IN1-6	XPN	
IN1-7	XTN	
IN1-8	ST	
IN1-9	XON	
IN1-10	CX	
IN1-11	XON	

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IN1-12	DT	
IN1-13	DT	
IN1-14	CM	
IN1-15	IS	
IN1-16	XPN	
IN1-17	IS	
IN1-18	TS	
IN1-19	XAD	
IN1-20	IS	
IN1-21	IS	
IN1-22	ST	
IN1-23	ID	
IN1-24	DT	
IN1-25	ID	
IN1-26	DT	
IN1-27	IS	
IN1-28	ST	
IN1-29	TS	
IN1-30	XPN	
IN1-31	IS	
IN1-32	IS	
IN1-33	NM	
IN1-34	NM	
IN1-35	IS	
IN1-36	ST	
IN1-37	CP	
IN1-38	CP	
IN1-39	NM	
IN1-40	CP	
IN1-41	CP	
IN1-42	CE	
IN1-43	IS	1 Insured's Sex
IN1-44	XAD	106 Insured's Employer Address
IN1-45	ST	2 Verification Status
IN1-46	IS	8 Prior Insurance Plan ID
IN1-47	IS	3 Coverage Type
IN1-48	IS	2 Handicap
IN1-49	CX	12 Insured's ID Number

Out Bound HL7 Messages – Observation Reporting

The Endosoft transmits an order (ORU^R01) to the HIS When ever the procedure gets marked finished in the Endosoft, On the agreed upon time period Endosoft interface closes the connection and reconnects it to the Server. Once it connects, the outgoing interface queries the procedure table and picks the procedures which has been marked finished.

Procedure Message -- Observational report (response to query for results of observation)

Message **ORU^R01**
Identity

Segment Grammar

MSH

PID

{[OBR]}

{[OBX]}

Table Grammar

	Name	Description
	MSH	-
	EndoProc	Table Corresponding to PROCEDURES table .
	BlobTable	Table for outputting blobs like
		Endoscopy Report
	ImageData	Image Data

MSH

The Endosoft usually uses Procedure Number as its application ID

01 Field separator

It is '|' (vertical bar).

02 Encoding characters

They are '^~\&'

03 Sending Application

ID of the sending application is "Endosoft"

05 Receiving Application

ID of receiving application is "HIS"

11 Processing ID

Code for processing, always 'P'

12 Version ID

2.2

OBR

01 Set Identification

02 Placer Order Number

Copy of field ORC/2

03 Filler Order Number

Unique ID that allows the order to be identified within Endosoft where subfield 1 contains the ID and subfield 2 the application code (to be agreed upon).

04 Universal service ID The procedure.

Subfield 1 : the ID of the procedure

Subfield 2 : name of the procedure

07 Observation date/time

Date and time of the (scheduled) order. YYYYMMDDHHMM

13 Relevant Clinical information

Medical information provided with the order. Maximum of 100 characters.

16 Ordering Provider

Subfield 1 - ID (6 pos, may be larger in the future) of orderer.

Subfield 2 - Name of orderer

18 Placer field #1

Information from the orderer from the original order.

19 Placer field #2

as in 18

20 Filler Field #1

Date and time the order was registered in Endosoft (YYYYMMDDHHMM).

22 ResultsReported / Status changed

Date and time of last change (YYYYMMDDHHMM)

24 Diagnostic Service Section ID

Location code where order was performed

25 Result status

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S-Order scheduled
I-Order started
P-Order finished
R-Order evaluated
F-order authorized and finalized
C-Order was corrected
D-Order was deleted

28 Result Copies To
Receivers of copies
Subfield 1 - ID (6 pos)
Subfield 2 - Name

This field may contain more than one receiver, separated by the repetition character.

32 Principal Result Interpreter Person (MD) who performed order.
Subfield 1 - ID (6 pos)
Subfield 2 - Name

33 Assistant Interpreter
Subfield 1 - ID (6 pos)
Subfield 2 - Name

34 Technician
Subfield 1 - ID (6 pos)
Subfield 2 - Name

35 Transcriptionist
Subfield 1 - ID (6 pos) Personell ID of hospital
Subfield 2 - Name

OBX

01Set Identification

02Value Type

Represents what kind of data. In the case of reports we suggest FT. For images we suggest RP that refer to the image and the way it can be retrieved (i.e. the physical path or DICOM UID for the PAX broker).

03Observation Identifier

Identification of the part of the order:

Subfield 1 - ID
Subfield 2 - Description
Subfield 3 - Coding System (L)

05Observation Result

Filled in accordance with field 2

11 Observation Result Status

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S-Order scheduled
I-Order started
P-Order finished
R-Order evaluated
F-order authorized and finalized
C-Order was corrected
D-Order was deleted

FT1 - Financial transaction segment

The FT1 segment contains the detail data necessary to post charges, payments, adjustments, etc. to patient accounting records.

Figure 6-1. FT1 attributes

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	O			00355	Set ID -FT1
2	12	ST	O			00356	Transaction ID
3	10	ST	O			00357	Transaction Batch ID
4	26	TS	R			00358	Transaction Date
5	26	TS	O			00359	Transaction Posting Date
6	8	IS	R		0017	00360	Transaction Type
7	80	CE	R		0132	00361	Transaction Code
8	40	ST	B			00362	Transaction Description
9	40	ST	B			00363	Transaction Description - Alt
10	6	NM	O			00364	Transaction Quantity
11	12	CP	O			00365	Transaction Amount - Extended
12	12	CP	O			00366	Transaction Amount - Unit
13	60	CE	O		0049	00367	Department Code
14	8	IS	O		0072	00368	Insurance Plan ID
15	12	CP	O			00369	Insurance Amount
16	80	PL	O			00133	Assigned Patient Location
17	1	IS	O		0024	00370	Fee Schedule
18	2	IS	O		0018	00148	Patient Type
19	60	CE	O	Y	0051	00371	Diagnosis Code
20	120	XCN	O		0084	00372	Performed By Code
21	120	XCN	O			00373	Ordered By Code

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22	12	CP	O			00374	Unit Cost
23	22	EI	O			00217	Filler Order Number
24	120	XCN	O			00765	Entered By Code
25	80	CE	O		0088	00393	Procedure Code

Embedded base64 encoded PDF

Endosoft systems can also send the PDF embedded within the HL7 file in Base64 encoding, if you would like to store the procedure report directly within HIS.

```
OBR|8|10702^ProceudureReport|11010^REPORT^^^|19950924|||||
||||201202251621|||F|||||
OBX|1|ED|10702-
0^REPORT EMBED||PDF^TEXT^^Base64^JVBERi0xLjINCjEgMCMvYmoNCjw8
DQ ...
```

Sample Result message

In this sample message an OBX segment is for each 'form'. If a report consists of a Consent Form, a Pre-Procedure Evaluation, Procedure Report and a letter to the referring MD then 4 OBX segments are added. If there were 5 images added to the report, another 5 OBX segments are added.

```
MSH|^~\&|ENDOSOFT||HIS||200108161524||ORU^R01|98|P|2.2
PID|||11||Doe|19400101|F|||||
OBR|1||98^ENDOSOFT|EGD^EGD||199806291128||||History of dyspepsia and
heartburn      not      repoding      to      therapy||^John      G
Referrer||||199806291128||199806291128||F|||||^John B Smith
OBX|1|TX|&^|CL^Consent Letter^L|.br|||||F
OBX|2|TX|&^|ER^Endoscopy Report^L|Endosoft at UTECH|.br\10
Railroad Ave, Albay, New York 12205 (800) 82 UTECH,
|.br|.br\Patient Name Isabel Doe|.br\Date of Birth
03/06/1945|.br\Record Number 1111|.br\Date/Time of Procedure
06/29/1998, 11:28 AM|.br\Referring Physician Sam
Allright|.br\Endoscopist John Doe \.br\ \.br\PROCEDURE
PERFORMED\0x011\|.br\|.br\INDICATIONS FOR
EXAMINATION|.br\History of dyspepsia and heartburn not repoding to
therapy|.br\Instruments: \0x011\|.br\Medications:
\0x011\|.br\Visualization: Good Tolerance: Good Complications: \.br\None
\0x011\|.br\Extent of Exam:\0x011\|.br\Limitations:
None|.br\Procedure Technique:
|.br\|.br\FINDINGS|.br\|.br\|.br\ENDOSCOPIC
```

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DIAGNOSIS\.\br\.\br\.\br\RECOMMENDATIONS\.\br\.\br\.\br\.\br\Signature:_____ John Doe,
M.D.\.\br\.\br\|||||F
OBX|3|TX|&^|PT^Procedure Technique^L|\.\br\|||||F
OBX|4|TX|&^|PR^Post Procedure Report^L|\.\br\|||||F
OBX|5|TX|&^|DR^Discharge Report^L|\.\br\|||||F
OBX|6|TX|&^|RL^Referring Letter^L|John Doe, M.D.\.\br\23 Main
Street\.\br\Anytown, NY 22222\.\br\.(123) 456-4567\.\br\.\br\Sam
Allright, M.D.\.\br\10 Railroad Ave\.\br\Albany, NY
12205\.\br\.\br\.\br\RE: Isabel Doe 06/29/1998\.\br\
03/06/1945\.\br\.\br\.\br\Dear Sam;\.\br\.\br\An endoscopic procedure was
performed on your patient Ms. Isabel Doe today.\.\br\Following is a synopsis of the
endoscopy report and my initial recommendations:\.\br\.\br\Procedure
Performed:\.\br\.\br\Indications:\.\br\History of dyspepsia and heartburn not
reponding to therapy\.\br\Findings:\.\br\.\br\Diagnosis:\.\br\.\br\Recommendations:\.
br\.\br\.\br\Thank you for the opportunity to assist you in the care of this patient.
The \.\br\findings were discussed with Ms. Doe today along with the
recommendations \.\br\and follow up arrangements. Please feel free to contact me if I
can be of any \.\br\further assistance.\.\br\.\br\Best
Wishes.\.\br\.\br\Sincerely;\.\br\.\br\.\br\John
Doe, M.D.\.\br\|||||F
OBX|7|RP|973&IMP^JPEG|^|^|973.JPEG|||||F
OBX|8|RP|974&IMP^JPEG|^|^|974.JPEG|||||F

Sample Result with Embedded PDF

MSH|^~\&|Endosoft|Endosoft||20200204103110||ORU^R01|441|T|2.3|||||||
PID||0756828||Testa^Tessa^||19700924|F||N/A|1 Gary Couper
Road^ADDR2^~NY^ZE2 9UZ|||||||||||||||||||||
PV1||04||||23441^SYSDBA^SYSDBA|^|^|||||||||||||||||||||
OBR|1||441^Endosoft|COLON^Colonoscopy||20191022093845||20191022|||||2
3441^SYSDBA^SYSDBA^|||20191022093845||20191022093845||F|||||23441^
SYSDBA^SYSDBA|^|^|^|||||||||
OBX|2|TX|COLON^Colonoscopy||PATIENT NAME:\HT\ Tessa Testa|||||||
OBX|3|TX|COLON^Colonoscopy||DATE OF BIRTH:\HT\ 9/24/1970|||||||
OBX|4|TX|COLON^Colonoscopy||RECORD NUMBER:\HT\ 0756828|||||||
OBX|5|TX|COLON^Colonoscopy||DATE/TIME OF PROCEDURE:\HT\ 10/22/2019 /
09:38:45 AM|||||||
OBX|6|TX|COLON^Colonoscopy||ENDOSCOPIST:\HT\ SYSDBA SYSDBA,
|||||||
OBX|7|TX|COLON^Colonoscopy||REFERRING PHYSICIAN:\HT\ |||||
OBX|8|TX|COLON^Colonoscopy|||||||
OBX|9|TX|COLON^Colonoscopy||PRE OPERATIVE DX:|||||||
OBX|10|TX|COLON^Colonoscopy|||||||
OBX|11|TX|COLON^Colonoscopy|||||||
OBX|12|TX|COLON^Colonoscopy||You have had the following procedure:
Colonoscopy|||||||
OBX|13|TX|COLON^Colonoscopy|||||||
OBX|14|TX|COLON^Colonoscopy||POST OPERATIVE DX:|||||||
OBX|15|TX|COLON^Colonoscopy|||||||
OBX|16|TX|COLON^Colonoscopy|||||||

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OBX|17|TX|COLON^Colonoscopy||ALLERGIES: |||||
OBX|18|TX|COLON^Colonoscopy||ANESTHESIA/MEDICATIONS:
\\HT\\|||
OBX|19|TX|COLON^Colonoscopy||EXTENT OF EXAM: cecum|||
OBX|20|TX|COLON^Colonoscopy||VISUALIZATION: Good\\HT\\TOLERANCE:
Good|||
OBX|21|TX|COLON^Colonoscopy||TECHNICAL DIFFICULTY: No\\HT\\LIMITATION:
|||
OBX|22|TX|COLON^Colonoscopy|||
OBX|23|TX|COLON^Colonoscopy||PROCEDURE:|||
OBX|24|TX|COLON^Colonoscopy||A physical exam was performed. Informed
consent was obtained from the patient after explaining all the risks (perforation,
bleeding, infection and adverse effects to the medicine), benefits and alternatives to
the procedure which the patient appeared to understand and so stated. The patient
was connected to the monitoring devices and placed in the left lateral position.
Continuous oxygen was provided with a nasal cannula and IV medicine administered
thru an indwelling cannula. After adequate conscious sedation was achieved, a
digital exam was performed and the colonoscope introduced in to the rectum and
advanced under direct visualization to the CECoMe. |||
OBX|25|TX|COLON^Colonoscopy|||
OBX|26|TX|COLON^Colonoscopy||The CECoMe was identified by visual landmarks.
The scope was subsequently removed slowly while carefully examining the color,
texture, anatomy, and integrity of the mucosa on the way out. In the rectum, the
scope was retroflexed to evaluate for internal hemorrhoids and anorectal pathology.
The patient was subsequently transferred to the recovery area in satisfactory
condition. |||
OBX|27|TX|COLON^Colonoscopy|||
OBX|28|TX|COLON^Colonoscopy||ESTIMATED BLOOD LOSS: None |||
OBX|29|TX|COLON^Colonoscopy||COMPLICATIONS: |||
OBX|30|TX|COLON^Colonoscopy|||
OBX|31|TX|COLON^Colonoscopy||TISSUE_SUBMITTED|||
OBX|32|TX|COLON^Colonoscopy|||
OBX|33|TX|COLON^Colonoscopy|||
OBX|34|TX|COLON^Colonoscopy||Post-Op Instructions|||
OBX|35|ED|COLON^Colonoscopy|RP|PDF^TEXT^^Base64^QmFzZTY0IFBERiBmaW
xlIGdvZXMGaGVyZQ==|||F|||

Addendum Message

MSH|^~\&|ENDOSOFT||HIS||200108161524||ORU^R01|98|P|2.2
PID|||11||Doe|19400101|F|||
OBR|1||98_A0^ENDOSOFT|EGD^EGD|||199806291128|||History of dyspepsia
and heartburn not repoding to therapy||^John G
Referrer|||199806291128||199806291128||F|||John B Smith
OBX|2|TX|&^|AR^Addendum Report^L|Endosoft at UTECH\\.br\\10 Railroad Ave,
Albay, New York 12205 (800) 82 UTECH, \.br\\.br\\Patient Name Isabel
Doe\\.br\\Date of Birth 03/06/1945\\.br\\Record Number 1111\\.br\\Date/Time of
Procedure 06/29/1998, 11:28 AM\\.br\\Referring Physician Sam
Allright\\.br\\Endoscopist John Doe \.br\\ \.br\\PROCEDURE

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PERFORMED\0x011\\.\br\\.\br\INDICATIONS FOR EXAMINATION\.\br\History of
dyspepsia and heartburn not repoding to therapy\.\br\Instruments:
\0x011\\.\br\Medications: \0x011\\.\br\Visualization: Good Tolerance: Good
Complications: \.\br\None \0x011\\.\br\Extent of Exam:\0x011\\.\br\Limitations:
None\.\br\Procedure Technique: \.\br\\.\br\FINDINGS\.\br\\.\br\\.\br\ENDOSCOPIC
DIAGNOSIS\.\br\\.\br\\.\br\RECOMMENDATIONS\.\br\\.\br\\.\br\\.\br\|||| F

Another format:

MSH|^~\&|UTECH|SMED|ENDOSOFT||200709121544||ORU^R01|172
8|P|2.2
PID|1||B166383||xxxx^JOANxx||1966xxxx|F|||||||4023635316
OBR|1||1728^ENDOSOFT|^Colonoscopy|||200709031400||^
|||Abnormal flexible sigmoidoscopy.|||^
|||200709031400||200709031400||UHND 2|F|||||^Bxxx Ixxx
OBX|0|TX|^Colonoscopy|Report|Foundation
Trust|||||F|||200709031400
OBX|1|TX|^Colonoscopy|Report|Endoscopy Unit|||||F|||200709031400
OBX|2|TX|^Colonoscopy|Report|Tel:
0000000000000000|||||F|||200709031400
OBX|3|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|4|TX|^Colonoscopy|Report|Patient Name:MRS
xxxx^JOANxx|||||F|||200709031400 OBX|5|TX|^Colonoscopy|Report|Date of
Birth:16/09/xxxx|||||F|||200709031400
OBX|6|TX|^Colonoscopy|Report|Hospital
Number:B166383|||||F|||200709031400
OBX|7|TX|^Colonoscopy|Report|Date of
Procedure:03/09/2007|||||F|||200709031400
OBX|8|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|9|TX|^Colonoscopy|Report|Endoscopist:Mr. Ixxx
Bxxx|||||F|||200709031400
OBX|10|TX|^Colonoscopy|Report|Registrar:|||||F|||200709031400
OBX|11|TX|^Colonoscopy|Report|Referring
Physician:|||||F|||200709031400
OBX|12|TX|^Colonoscopy|Report|Intern: DR xx
Wxxxx|||||F|||200709031400
OBX|13|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|14|TX|^Colonoscopy|Report| University|||||F|||200709031400
OBX|15|TX|^Colonoscopy|Report|Of Durham|||||F|||200709031400
OBX|16|TX|^Colonoscopy|Report| Student|||||F|||200709031400
OBX|17|TX|^Colonoscopy|Report|Health
Centre|||||F|||200709031400
OBX|18|TX|^Colonoscopy|Report| 42 Old|||||F|||200709031400
OBX|19|TX|^Colonoscopy|Report|Elvet|||||F|||200709031400
OBX|20|TX|^Colonoscopy|Report| xxxxxx|||||F|||200709031400
OBX|21|TX|^Colonoscopy|Report| DH1 3JF|||||F|||200709031400
OBX|22|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|23|TX|^Colonoscopy|Report|||||F|||200709031400

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OBX|24|TX|^Colonoscopy|Report|Medications: Buscopan 20 mg, Midazolam 4 mg,
Pethidine 50 mg|||||F|||200709031400
OBX|25|TX|^Colonoscopy|Report|Instrument:
cs6|||||F|||200709031400
OBX|26|TX|^Colonoscopy|Report|Extent of Exam:
Caecum|||||F|||200709031400
OBX|27|TX|^Colonoscopy|Report|Visualization:
Good|||||F|||200709031400
OBX|28|TX|^Colonoscopy|Report|Tolerance:
Good|||||F|||200709031400
OBX|29|TX|^Colonoscopy|Report|Complications:
None|||||F|||200709031400
OBX|30|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|31|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|32|TX|^Colonoscopy|Report|PROCEDURE
PERFORMED|||||F|||200709031400
OBX|33|TX|^Colonoscopy|Report|Colonoscopy|||||F|||20070903140 0
OBX|34|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|35|TX|^Colonoscopy|Report|INDICATIONS FOR
EXAMINATION|||||F|||200709031400
OBX|36|TX|^Colonoscopy|Report|Abnormal flexible
sigmoidoscopy.|||||F|||200709031400
OBX|37|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|38|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|39|TX|^Colonoscopy|Report|FINDINGS|||||F|||200709031400
OBX|40|TX|^Colonoscopy|Report|1 mm Pedunculated polyp in the rectum, 10 cm
from the anorectal verge.
Polypectomy|||||F|||200709031400
OBX|41|TX|^Colonoscopy|Report|performed with snare resection.
Polyp retrieved. Histology pending.|||||F|||200709031400
OBX|42|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|43|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|44|TX|^Colonoscopy|Report|ENDOSCOPIC
DIAGNOSIS|||||F|||200709031400 OBX|45|TX|^Colonoscopy|Report|Rectal
polyp.|||||F|||200709031400
OBX|46|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|47|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|48|TX|^Colonoscopy|Report|RECOMMENDATIONS|||||F|||20070
9031400
OBX|49|TX|^Colonoscopy|Report|Follow up in OPD
Urgently|||||F|||200709031400
OBX|50|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|51|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|52|TX|^Colonoscopy|Report|RECALL
DATE|||||F|||200709031400
OBX|53|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|54|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|55|TX|^Colonoscopy|Report|COMMENTS|||||F|||200709031400
OBX|56|TX|^Colonoscopy|Report|||||F|||200709031400

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OBX|57|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|58|TX|^Colonoscopy|Report|OPCS4
Code:|||||F|||200709031400
OBX|59|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|60|TX|^Colonoscopy|Report|Signature:_____

Mr. xxxx xxxx|||||F|||200709031400
OBX|61|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|62|TX|^Colonoscopy|Report|DRGHxxxxx|||||F|||200709031400
OBX|63|TX|^Colonoscopy|Report|||||F|||200709031400
OBX|64|TX|^Colonoscopy|Report|University Of xxxxxxxx|||||F|||200709031400
OBX|65|TX|^Colonoscopy|Report|Student Health
Centre|||||F|||200709031400
OBX|66|TX|^Colonoscopy|Report|42 xxxx|||||F|||200709031400
OBX|67|TX|^Colonoscopy|Report|xxxxxxxx|||||F|||200709031400
OBX|68|TX|^Colonoscopy|Report|DH1 xxx|||||F|||200709031400
OBX|1|RP|pdf^pdf||http://192.168.111.21/1728.pdf HNAM
WEB^URL^Endosoft|||||F|||200709031400

Scheduling

SIU – Schedule Information Unsolicited

MSH	Message Header
SCH	schedule Activity Information
NTE	notes and comments
PID	patient Identification
PV1	patient visit
PV2	patient visit – additional information
OBX	Observation segment
DG1	Diagnosis Information
RGS	Resource Group Segment
AIS	Appointment information service
NTE	Notes and comments
AIG	Appoint information – general Resource
NTE	Notes and Comments
AIL	Appointment information – Location Resources
NTE	Notes and comments
AIP	Appointment Information – Personnel Resource
NTE	Notes and Comments

ACK General Acknowledgement

MSH Message Header

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MSA	Message Acknowledgement
[ERR]	Error Information

Events Supported

Notification of new appointment booking **(Event S12)**
Notification of appointment rescheduling **(Event S13)**
Notification of appointment modification **(Event S14)**
Notification of appointment cancellation **(Event S15)**
Notification of appointment discontinuation **(Event S16)**
Notification of appointment deletion **(Event S17)**

Order Messages (ORM^O01)

Order messages can be sent to Endosoft for Scheduling information needed to schedule an appointment in endosoft.

MSH	Message Header
PID	patient Identification
PV1	patient visit
PV2	patient visit – additional information
ORC	Common Orders
OBX	Observation segment

Minimum information needed for Endosoft to schedule an appointment are Date of appointment, Time of Appointment, Procedure to be performed and Physician name.

Physician name - 437577^Duncan^Carolyn^J
Date and time of Appointment – YYYYMMDDHHMMSS (20031209083500)
Procedure – Col^Colonoscopy

Pathology messages

Observational report (results of observation)

Result messages can be sent to Endosoft for pathology and each line of the Pathology report should be sent in each OBX.

Message Identity	ORU^R01
------------------	----------------

Segment Grammar

MSH

PID

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{[OBR]}

{[OBX]}

Example Pathology result message:

```
MSH|^~\&||||200401221203||ORU^R01||P|2.0
PID|||87654321||John^Doe||195702140000|M|||000 San Juan
Drive^^Coral Gables^Florida^33143||132-666-1900|||||012449259
OBR|||GI
BIOPSY^GI|78611000||200401151052||||||^Doe^Ron^^^
M.D.|||||200401151052|||F
OBX|1|TX|||Lab Name: Test Lab, LLC.|||||F
OBX|2|TX|||Record Id: 28|||||F
OBX|3|TX|||Micro Date: 1/15/2004|||||F
OBX|4|TX|||Pathologist: Michael John, M.D. |||||F
OBX|5|TX|||EndosoftId: 0001|||||F
OBX|6|TX|||Item A: COLON, SIGMOID, 30 CM, BIOPSY:|||||F
OBX|7|TX|||Gross Description: Two tan fragments measuring 4 mm
and 4 mm.|||||F
OBX|8|TX|||Diagnosis |||||F
OBX|9|TX|||NONSPECIFIC COLITIS, MODERATE WITH LYMPHOID
FOLLICLES.|||||F
OBX|11|TX|||Item B: RECTUM, BIOPSY:|||||F
OBX|12|TX|||Gross Description: Single tan fragment measuring 4
mm.|||||F
OBX|13|TX|||Diagnosis |||||F
OBX|14|TX|||ACUTE HEMORRHAGIC AND CHRONIC NONSPECIFIC
PROCTITIS, MODERATE.|||||F
OBX|16|TX|||Item C: STOMACH, ANTRUM, BIOPSY:|||||F
OBX|17|TX|||Gross Description: Twotan fragments measuring 4 mm
and 3 mm.|||||F
OBX|18|TX|||Diagnosis |||||F
OBX|19|TX|||CHRONIC GASTRITIS, MILD.|||||F
OBX|20|TX|||NEGATIVE FOR HELICOBACTER BY GIEMSA
STAIN.|||||F
OBX|21|TX|||NEGATIVE FOR ATYPIA OR MALIGNANCY.|||||F
OBX|23|TX|||Note: |||||F
```

OR it can be sent like:

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MSH|^~
&|ENDOSOFT|SMED|COR||200707161202||ORU^R01|6057|P|2.2
PID|||123|0|A.
Doe^William||19800909|F|||||||00001211234|00000-0000
IN1||||Empire Blue Cross~CDPHP||||564618~453454|||||Adam K
Smith~TEST|||||||||YLN21681461~CD345354333
OBR|||6057^ENDOSOFT|E1|||200704191541||||NEIL ROSEN
|||||200704191541||200704191541||||F|||||^NEIL ROSEN
OBX|1|TX||PR|PATHOLOGY REQUISITION~~ENDOSCOPY AND
SURGICAL CENTER~7875 SW SUITE 201, FLORIDA 33153~302
2700000~~~Patient Name Doe A. William~Date of Birth
06/09/1980~Record Number 21756333~Procedure Number
322450~Date/Time of Procedure 07/16/2007, 07:05 AM~Referring
Physician GAB LIZ, M.D.~Endoscopist Smith ROSEN, M.D. ~Nurse
LISSETTE Smith~ ~PROCEDURE PERFORMED~EGD -
Biopsy~~INDICATIONS FOR EXAMINATION~Chronic
dyspepsia~~Tissue Submitted~Biopsy of antrum.~~~FINDINGS~Mild
antral gastritis.~Remainder unremarkable~~ENDOSCOPIC
DIAGNOSIS~Mild antral gastritis.~Remainder
unremarkable~~RECOMMENDATIONS~Call my office for final
procedure and pathology results in 3
days.~~~Signature: _____ NEIL
ROSEN, M.D. ~CPT Codes~43239 UPPER GI ENDOSCOPY; W/ BX,
SINGLE/MULTIPLE~~ICD-9 Codes~535.4 OTHER SPECIFIED
GASTRITIS~|||||F

Query

Endosoft will initiate a query and waits for the HIS (responder) to answer with data on one or more patients (Immediate Response). For following response-queries the use of DSC segments is supported. It is not necessary to send the message on a first in, first out basis. If any change is made to the patient data ADT^A04 and ADT^A08 messages can be used to keep the data synchronized with the HIS.

The query message

MSH
QRD
[DSC]

Response to a query

MSH MSA
QRD
{ PID
 [ZPI]
 PV1
 [IN1]
}
[DSC]

QRD

01 Query date time

Date and time of query, YYYYMMDDHHMM

02 Query format code

'R' only (record oriented) for patient query

03 Query priority

'I' only (immediate)

04 Query ID

Unique ID for the query

07 Quantity limited request

08 Who subject filter

ID for the searched patients.

Patient ID for DEM queries

Part of name for APN (do not use '*') (JANSEN) Date of Birth (YYYYMMDD)

09 What subject filter

DEM Demographics (minimal requirement for query).

APN Patient name lookup (not recommended).

PBN Date of Birth and name.

ZPI

01 Set ID

01 Indication Deceased.

Not implemented in queries yet.

02 Name of partner

03 MD of patient

Subfield 1: 6 pos ID of MD (Physician of patient).

Subfield 2: Name of MD

Sample Outgoing query message from Endosoft

```
MSH|^~\&|Endosoft||HIS||2000112913212||QRY^Q01|20001129132121012|P|2.2
QRD|200011291320|R|I|200011291321210|||10^RD|1234560|DEM
```

Sample in-coming query reply messages (response from HIS):

```
MSH|^~\&|HIS||LABQRY||20000724145115||ACK|20000724145115000006|P|2.2
MSA|AR|5760087001250|Patient not in HIS
QRD|199812101030|R|I|5768700125|||10^RD|121|DEM
```

(Patient was not found in HIS)

```
MSH|^~\&|ZIS||LABQRY||20000724144653||ADT^A19|20000724144653000001|P|2.2
MSA|AA|5760087001250
QRD|199812101030|R|I|5768700125|||10^RD|1234560|DEM
PID|0001|02801860|1234560||Test^Pat^J||19330313|M|||Address||038-3326751|||M|NH
ZPI|0001|||012323^WILD^R^^Danial
PV1||O
IN1|||040900|xyz
```

```
MSH|^~\&|ZIS||LABQRY||20000724144814||ADT^A19|20000724144814000004|P|2.2
MSA|AA|5760087001250
QRD|199812101030|R|I|5768700125|||10^RD|4348282|DEM
PID|0001|00840342|4348282||Pat^Test^H||19230528|F|||Address||038-4533598|||M
ZPI|0001|||Wife||014832^EDEMA^SJ
PV1||O
IN1|||000091|Test|405969562
```

Out Bound Transcription Interface

1. MESSAGE SPECIFICATIONS

The Endosoft Outbound transcription interface Export Report transcriptions from Endosoft database and sends them to HIS system. The interface operates in one of two modes; (1) Exporting the content of the Report or (2) Exporting a pointer to where the Report can be located on a network file system or shared file systems drive connected to the Endosoft server.

MDM^T02 Original Document Notification and Content

This is a notification that a new Report has been transcribed.

MDM^T08 Edit Notification and Content

This is a notification that an existing Report has been edited/updated.

MDM	Transcription Message
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit
TXA	Document Notification
{OBX}	Observation Notes

2. DETAILED SEGMENT LISTINGS

MSH – Message Header

Sequence	Required	Element Name	Notes
1	Y	Field Separator	Typically:
2	Y	Encoding Characters	Typically: ^~\&
3	Y	Sending Application	ENDOSOFT
4	Y	Sending Facility	User defined

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5	N	Receiving Application	User defined
6	N	Receiving Facility	Blank
7	Y	Date/Time of Message	Standard HL7 format
9	Y	Message Type	MDM^T02
10	Y	Message Control ID	Unique message ID
11	Y	Processing ID	D: Debug, P:Production
12	Y	Version ID	2.3 or 2.5
13	N	Sequence Number	Unique number generator
14	N	Continuation Pointer	
15	N	Accept Acknowledgment Type	
16	N	Application Acknowledgment Type	
17	N	Country Code	
18	N	Character Set	
19	N	Principal Language	

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EVN – Event Type

Sequence	Required	Element Name	Notes
1	Y	Event Type Code	
2	Y	Date/Time of Event	

PID – Patient Identification

Sequence	Required	Element Name	Notes
1	N	Set ID – Patient ID	1,2,3,4 (Usually set at 1)
2	N	Patient ID (External ID)	
3	Y	Patient ID	Record Number
5	Y	Patient Name	
7	N	Date of Birth	
8	N	Sex	
19	N	SSN Number Patient	

PV1 – Patient Visit

Sequence	Required	Element Name	Notes
3	N	Patient Location	Depending on customer's unique episode criteria and on whether report is episode linked or only linked to patient
4	N	Episode Type	
7	Y	Attending Physician	Code^Lname^Fname^Mname (See Attachment 4)
10	N	Hospital Service	
19	N	Visit Number	Unique identifier for an episode; see note for sequence no. 3 above
39	Y	Clinic Code	(See Attachment 4)
44	Y	Admit Date/Serv. Date	See note for sequence no. 3 above
45	N	Discharge Date	See note for sequence no. 3

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			above
50	N	Alternate Visit ID	Billing account number

TXA – Transcription Report Header

Sequence	Required	Element Name	Notes
2	Y	Document Type	Document type
4	Y	Activity Date/Time	e.g., service date
6	Y	Origination Date/Time	Dictation date
7	Y	Transcription Date/Time	Transcription date
8	N	Edit Date/Time	For updates only
9	Y	Originator Code/Name	Dictating doctor
11	N	Transcriptionist	Transcriptionist code/name
12	Y	Unique Document ID	Unique Number generator
13	N	Parent Document	
		Number	
17	Y	Document Status	Document completion status (AU)
18	N	Confidentiality Status	Site-specific code values
19	N	Document Availability	Document availability status (AV)

OBX – Observation

Sequence	Required	Element Name	Notes
1	Y	Set ID	Sequential numbering for each OBX segment
2	Y	Value Type	TX – text
3	Y	REPORT	The text of the document.

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5	Y	Observation Value	The text of the document.
---	---	-------------------	---------------------------

Pharmacy Interface

HL7 RDE Message–Pharmacy/Treatment Encoded Order Message

Used by clinical applications to send an order to the pharmacy and/or dispensing systems. It may be sent as either an order containing a single pharmacy/treatment order for a patient or as an order containing multiple pharmacy/treatment orders for a patient (e.g., 1 mg tablet of Aspirin, 0.5 mg 0.5% Albuterol).

The transmission of orders occurs between the clinical application placing the order (the placer) and the clinical application filling the order (the filler). Typically, the clinician (e.g., physician) is entering orders on the [EndoVault](#) application which acts as the placer application in HL7 parlance. The system to which the order is targeted (e.g., the medication in the case of a complete pharmacy order) is the filler of the order.

The three RDE messages include Pharmacy encoded order messages:

- **RDE-001** - ORM - Order message (also RDE, RDS, RGV, RAS)
- **RDE-011** - RDE - Pharmacy/treatment encoded order
- **RDE-025** - RDE - Pharmacy/treatment refill authorization request

The segments and groups of segments in the RDE message are as follows, and apply for all trigger events.

SEGMENT/GROUP	NAME	OPTIONAL/REPEATABLE?
MSH	Message header	Required
NTE	Notes and comments	Optional, Repeatable
PatientGroup – Optional		

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SEGMENT/GROUP	NAME	OPTIONAL/REPEATABLE?
PID	Patient identification	Required
PID1	Patient demographics	Optional
NTE-1	Notes and comments	Optional, Repeatable
PatientVisitGroup – Optional		
PV1	Patient visit	Required
PV2		Optional
		Required
		Optional
		Optional
		Optional
		Optional, Repeatable
		Required
		Required
		Optional, Repeatable
		Repeatable
		Repeatable
		Optional, Repeatable
		Required
		Repeatable
		Optional, Repeatable
		Optional
		Optional
CTI	Clinical Trial Identification	Optional
	Patient visit – additional info	

InsuranceGroup – Optional and repeatable group

IN1	Insurance
IN2	Insurance additional info
IN3	Insurance additional info certification
GT1	Guarantor
AL1	Patient allergy information

PatientGroup – Optional

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OrderGroup – Repeatable

ORC Common order segment

PrescriptionOrderGroup – Optional

RXO Pharmacy prescription order

segment

NTE-2 Notes and comments segment

RXR Pharmacy route segment

ComponentOrderGroup – OptionalIM

RXC Pharmacy component order segment

NTE-3 Notes and comments segment

PrescriptionOrderGroup - Optional

RXE Pharmacy encoded order segment

RXR-1 Pharmacy route segment

RXC-1 Pharmacy component order segment

ObservationGroup - Repeatable

OBX Observation segment

NTE-4 Notes and comments segment

ObservationGroup - Repeatable

In HL7 pipe and hat format, the RDE message would look like this:

```
MSH|^~\&|ENDOVAULT_IF_FEED_OUT|ENDOVAULT Medical  
Center|||20091026120921||RDE|20091026120921|P|2.3||  
EVN||2009102612092156|||KLS  
PID||1061418|1061418||PYXIS^TEST^PATIENT 2||19240829|M||W|4130 US HWY  
64E^^Clifton^NC^0000028906|CHE|8288378161^^^^0000000000|0000000  
000||S|OT|1061418|999999999|||||||||N  
PV1||1^I/P^00|003^UCC12^|D|||005600^Test^Doe^MD|^^|^^|1||||||00  
5600^Test^Doe^MD|||||||||||||||||200910010938|  
PV2||||||U|20090930000000|||||||||||||||  
MRG|112923  
OBX|1|ST|1010.3^Height||072|Inches  
OBX|2|ST|1010.1^Body Weight||190.00|pounds  
AL1|||99999998^No Known Drug Allergies  
DG1|||||A  
ORC|XO|0000010|||IP||1^BID&1000,2200,^^200910150932^^0^0^  
RXE|1^BID&1000,2200,^^200910150932^^0^0^|361906^PROPRANOLOL 40MG TAB  
(INDERAL)|40||MG|EACH|HOLD FOR SBP #lg;90 |||1|||||||||||  
RXR|^PO NTE|||
```


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General Order Message (ORM)

Endosoft send the ORM message whenever an order is created, modified or cancelled

Segment Grammar

MSH

PID

[PV1]

{
ORC

OBR

{{[NTE]}}

{{[DG1]}}

{{[OBX]}}
}

Example: General Order message

```
MSH|^~\&||26589||69853|20060112123508|HJONES|ORM^O01|162|P|2.3||  
PID|1||59863512||SMITH^JOHN^^^^||19840116|M|||26 FIRST  
ST^^MADISON^WI^53705^USA^^^|||||1568459|  
ORC|NW|06-CH0002703||||^^^^^ROUTINE||||12^GRANT^JILL^^^^|||  
OBR|1|06-  
CH0002703||10216|||200601121233|||HJONES|O||||12^GRANT^JILL^^^^|312|||||||^^^^^ROUT  
INE  
OBX|1||18|||-|||||||62110|XE  
OBX|2||19|||-|||||||62110|XE
```

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Table Grammar

MSH

Endosoft usually uses Procedure Number as its application ID

01 Field separator

It is '|' (vertical bar).

02 Encoding characters

They are '^~\&'

03 Sending Application

ID of the sending application is "Endosoft"

05 Receiving Application

ID of receiving application is "HIS"

11 Processing ID

Code for processing, always 'P'

12 Version ID

2.2

ORC

01

Order Control

02

Placer Order Number

03

Filler Order Number

09

Date/Time of Transaction

12

Ordering Provider

OBR

01 Set Identification

02 Placer Order Number

Copy of field ORC/2

03 Filler Order Number

Unique ID that allows the order to be identified within Endosoft where subfield 1 contains the ID and subfield 2 the application code (to be agreed upon).

04 Universal service ID

The procedure.

Subfield 1: the ID of the procedure

Subfield 2: name of the procedure

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07 Observation date/time

Date and time of the (scheduled) order. YYYYMMDDHHMM

13 Relevant Clinical information

Medical information provided with the order. Maximum of 100 characters.

16 Ordering Provider

Subfield 1 - ID (6 pos, may be larger in the future) of orderer.

Subfield 2 - Name of orderer

18 Placer field #1

Information from the orderer from the original order.

19 Placer field #2

as in 18

20 Filler Field#1

Date and time the order was registered in Endosoft (YYYYMMDDHHMM).

22 Results Reported / Status changed

Date and time of last change (YYYYMMDDHHMM)

24 Diagnostic Service Section ID

Location code where order was performed

25 Result status

S-Order scheduled

I-Order started

P-Order finished

R-Order evaluated

F-order authorized and finalized

C-Order was corrected

D-Order was deleted

28 Result Copies To

Receivers of copies

Subfield 1 - ID (6 pos)

Subfield 2 - Name

This field may contain more than one receiver, separated by the repetition character.

32 Principal Result Interpreter

Person (MD) who performed order.

Subfield 1 - ID (6 pos)

Subfield 2 - Name

33 Assistant Interpreter

Subfield 1 - ID (6 pos)

Subfield 2 - Name

34 Technician

Subfield 1 - ID (6 pos)

Subfield 2 - Name

35 Transcriptionist

Subfield 1 - ID (6 pos) Personnel ID of hospital

Subfield 2 - Name

OBX

01Set Identification

02Value Type

Represents what kind of data. In the case of reports we suggest FT. For images we suggest RP that refer to the image and the way it can be retrieved (i.e. the physical path or DICOM UID for the PAX broker).

03 Observation Identifier

Identification of the part of the order:

Subfield 1 - ID

Subfield 2 - Description

Subfield 3 - Coding System (L)

05 Observation Result

Filled in accordance with field 2

11 Observation Result Status

S-Order scheduled

I-Order started

P-Order finished

R-Order evaluated

F-order authorized and finalized

C-Order was corrected

D-Order was deleted

Master File Notification (MFN)

Endosoft can send MFN messages when a provider is added or updated in the system. Endosoft can also receive this message, which will update the provider in the EHR system. This provider information can then be used to book procedure or visit in the EHR.

Segment Grammar

MSH

Message Header

MFI

[MFE]

STF

Table Grammar

MFE

01 Add or Update (MAD/MUP)

STF

01 Primary Key Value-STF

02 Staff Identifier List

03 Staff Name

04 Staff Type

05 Administrative Sex

06 Date/Time of Birth

09 Hospital Service-STF

10 Phone

11 Office/Home Address/Birthplace

12 Institution Activation Date

13 Institution Inactivation Date