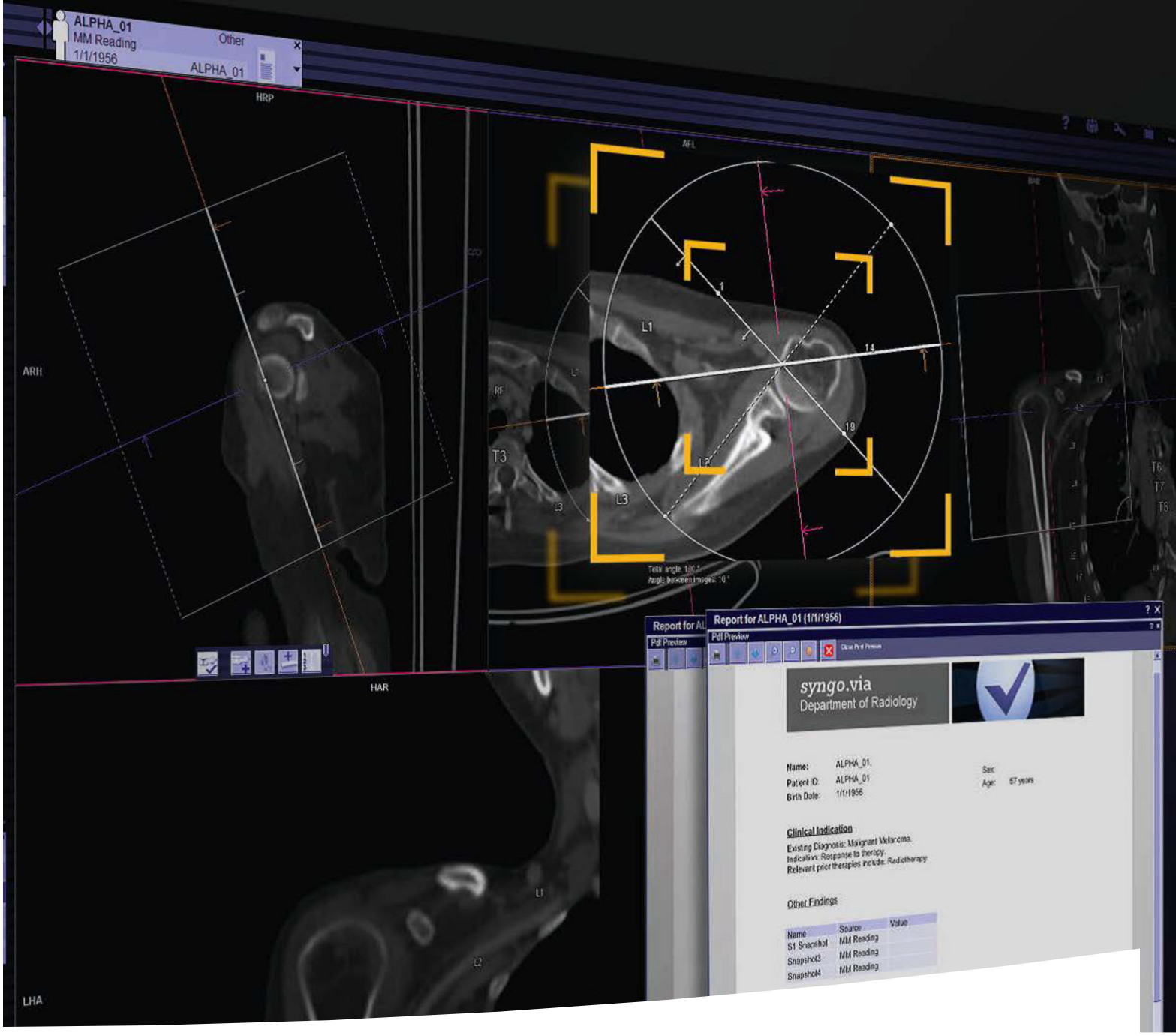


# HL7 Conformance Statement

# syngo.via

# VB60A



SIEMENS Healthineers

SIEMENS Healthineers

# Table of Contents

SIEMENS Healthineers

# 1 Introduction

## 1.1 Purpose

This document gives a compact view to the HL7 interface provided by syngo.via. The HL7 interface of syngo.via is based on the requirements and suggestions of the IHE Framework [1], in regard to supported message types.

Hint: Messages, that do not 100% comply to the definition of IHE, but contain the minimum required information as per definition of syngo.via, are nevertheless processed. Please refer to Chapter 6 “Required attributes” for the list of mandatory information.

## 1.2 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of HL7 and IHE.

## 1.3 Definitions, Terms and Abrreviations

### 1.3.1 Abbreviations

| | |
|---|---|
| HL7 | Health Level Seven |
| IHE | Integrating the Healthcare Enterprise |
| ISR | Imaging Service Request |
| OEM | Original Equipment Manufacturer |
| RIS | Radiology Information System |
| RP | Requested Procedure |
| SPS | Scheduled Procedure Step |

### 1.3.2 Definition and Terms

HL7 HL7 is a standard for information exchange between medical applications. It is an abbreviation of "Health Level Seven", 7th OSI layer protocol for the health environment. (OSI = Open Systems Interconnect, a model to describe defined layers in a network operating system). The HL7 protocol defines the format and the content of the messages that applications have to pass to one another under various conditions (e.g. to pass the message between applications / systems that a patient has been admitted in a hospital).

IHE Integrating the Healthcare Enterprise is an initiative designed to stimulate the integration of the information systems that support modern healthcare institutions.

ISR An Imaging Service Request includes pertinent specific and general information. Each instance of an Imaging Service Request carries the information common to one or more Requested Procedures requested at the same moment. For further information please refer to [3].

RP A Requested Procedure is an instance of a Procedure of a given Procedure Type. An instance of a Requested Procedure includes all of the items of information that are specified by an instance of a Procedure Plan that is selected for the Requested Procedure by the imaging service provider. For further information please refer to [3].

SPS A Modality Scheduled Procedure Step is an arbitrarily defined scheduled unit of service, that is specified by the Procedure Plan for a Requested Procedure. A Modality Scheduled Procedure Step prescribes the Protocol which may be identified by one or more protocol codes. A Modality Scheduled Procedure Step involves equipment (e.g. imaging Modality equipment, anesthesia equipment, surgical equipment, transportation equipment), human resources, consumable supplies, location, and time (e.g. start time, stop time, duration). For further information please refer to [3].

## 1.4 References

[1] IHE Radiology Framework, Vol. I – IV, http://www.ihe.net/Technical_Frameworks

[2] HL7 Standard, chapter 2 “Control”, http://www.hl7.org/

[3] DICOM Standard, 2016a, http://medical.nema.org/

## 1.5 Revision History

| Version | Date | Author | Change and Reason |
|---|---|---|---|
| 1.0 | 14-06-21 | Krisztian Paka (ADV D EU HU OPS 4 3) | Review findings incorporated. |
| 0.1 | 27-05-21 | Paka, Krisztian | Draft version for syngo.via VB60A HL7 based on version 1.0 of syngo.via VB50B HL7. |

# 2 General Information

Siemens Healthineers offers advanced RIS, PACS, and Processing features for all imaging needs in radiology and cardiology.

syngo.via, on which this Conformance Statement focuses, provides a set of interfaces for tight integration with radiology information systems.

- An OEM interface is used to realize frontend integration (remote image callup).
- For backend communication there is a bi-directional interface available, where the HL7 interface comprises the RIS to syngo.via communication parts. Furthermore syngo.via is informed about new procedures via DICOM Modality Worklist service.

# 3 Overview

syngo.via supports the following features in regards to the HL7 communication:

- Patient Update / Merge (ADT^A08, ADT^A40 or ADT^A34)
- Report Export (ORU^R01)
- Report Import (ORU^R01) for the option syngo.via WebReport

For the definiton of these interfaces, IHE was used as a basis, therefore syngo.via expects the Patient Update or Merge messages from the Information System to be compliant to IHE semantics. The structure of the Report Export message syngo.via is sending out is geared to those definitions as well. The structure of the Report Import message is aligned with the SINR profile, but other forms are also supported.

For an overview about all supported IHE actors/profiles, please take a look at the IHE Integration Statement published at www.siemens.com/ihe.

## 3.1 Supported Messages

The table below provides an overview about all HL7 messages that are supported by syngo.via as receiving application.

**Table 1: Overview of supported HL7 messages**

| Message | Description | Segment Composition |
|---|---|---|
| Inbound Messages | | |
| ADT^A08 | Patient Update | MSH, EVN, PID, [MRG], [PV1] |
| ADT^A40 | Patient Merge | MSH, EVN, PID, [MRG], [PV1] |
| ADT^A34 | Patient Merge – Patient ID only | MSH, EVN, PID, [MRG], [PV1] |
| ORU^R01 | Unsolicited Transmission of an observation to be transferred to syngo.via WebReport | MSH, PID, OBR, {OBX}, [PV1] |
| Outbound Messages | | |
| ORU^R01 | Unsolicited Transmission of an observation | MSH, PID, OBR, {OBX} |

## 3.2 ACK/NACK Behavior

If a message is sent to syngo.via which is not supported (e.g. ORU) or a mandatory attribute is missing (e.g. Patient Name), syngo.via nevertheless replies with an HL7 ACK in order to avoid blocking the connection. The message is stored within the backlog of the HL7 gateway. (see Table 12 for a list of required attributes which are expected by syngo.via)

# 4 Implementation Details

## 4.1 HL7 Version

Generally syngo.via will expect HL7 version 2.5.1 as this version is required by IHE Radiology Framework. But messages based on version 2.4 and 2.5 will also be processed.

## 4.2 Configuration

### 4.2.1 Minimal Layer Protocol

The syngo.via HL7/XML interface uses HL7's Minimal Layer Protocol (MLP) protocol over TCP/IP to receive and send messages. Briefly, message body is encoded using transaction framing with 0xB start and 0x1C+0xD end.

| TXS | TX Body | | | | | | | | | | | | TXE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0xB | A | B | C | D | E | … | | | | | | | 0x1C | 0xD |

**Figure 1: Encoding message using MLP**

Such encoded transactions are then sent to (or received from) a TCP/IP port at the syngo.via HL7/XML interface.

### 4.2.2 Sending Messages to Product

MLP encoded HL7 messages have to be sent to the port 9973 at the syngo.via HL7/XML interface. No additional configuration needs to be done on the syngo.via HL7/XML interface if the port is 9973. Note that the TCP/IP connection is permanent and the interface port is blocked as long as the IS is connected to it (dedicated connection).

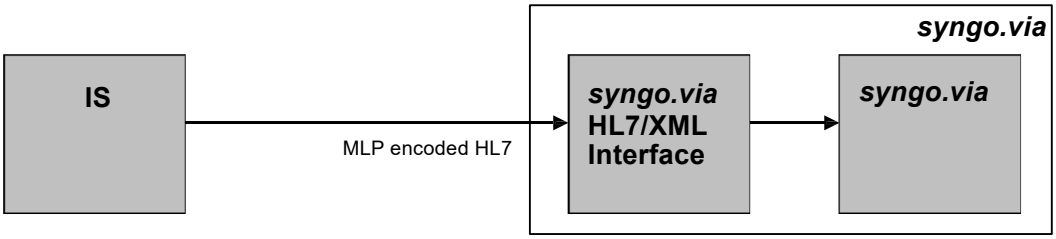


**Figure 2: Sending HL7 to syngo.via HL7/XML interface**

### 4.2.3 Sending Messages out of Product

MLP encoded HL7 messages are sent to the receiving port of the Information System. This port needs to be configured within the syngo.via HL7/XML interface. Additionally to the Port configuration the IP address of the receiving system needs to be set on the syngo.via HL7/XML interface. Note that the TCP/IP connection is permanent and the interface port is blocked as long as the IS is connected to it (dedicated connection).

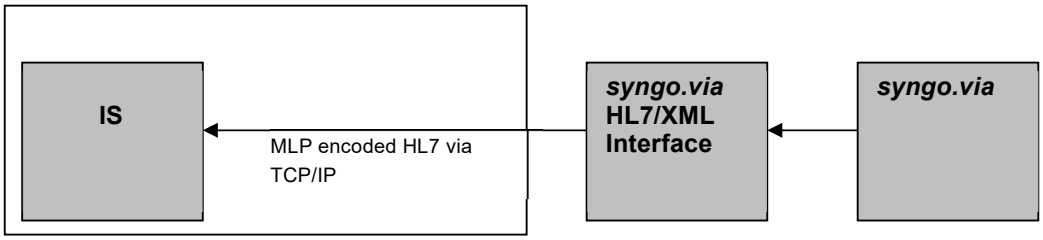


**Figure 3: Sending HL7 out of syngo.via**

### 4.2.4 Patient ID Matching

If objects are either created or updated at the RIS, syngo.via tries to find a matching existing patient and Requested Procedure (RP). If it finds either of that, it performs an update rather than creating a new record.

To match a patient, a configurable combination of the following fields is used.

- Patient ID (PID-3.1) (mandatory)
- Assigning Authority (PID-3.4)
- Patient Name (PID-5)
- Patient Date of Birth (PID-7)

The patient is by default identified through Patient ID and Assigning Authority/Issuer of Patient ID. If the latter is not set and no default value is set for Assigning Authority/Issuer of Patient ID the above mentioned configuration is applied for patient identification.

### 4.2.5 Supported Charactersets

UTF-8 is the de-facto standard encoding for v2 messages in North America, in Europe it's ISO 8859-1 (Latin-1). UTF-8 is the commonly used encoding for UNICODE. Note that UNICODE is an example of a character set, it is not a character encoding. Use "UNICODE UTF-8" in MSH.18 and you're all set.

# 5 Inbound Messages

## 5.1 Patient Update / Merge

The Patient information Update and Patient Merge messages trigger changes to patient information, including demographics, patient identification, patient location/class changes, and patient merges. These changes may occur at any time for a patient record. These messages are used for both inpatients (i.e., those who are assigned a bed at the facility) and outpatients (i.e., those who are not assigned a bed at the facility) if the patient has been previously registered.

### 5.1.1 Patient Information Update – ADT^A08

Changes to patient demographics and account information (e.g. change in patient name, patient address, etc.) shall trigger an ADT^A08 Update Patient message.

The table below indicates the message semantics of the ADT^A08 message:

**Table 2: Message semantics of ADT^A08 according to IHE**

| ADT^A08 | Segment Name | Chapter in HL7 |
|---|---|---|
| MSH | Message Header | 2 |
| EVN | Event Type | 3 |
| PID | Patient Identification | 3 |
| PV1 | Patient Visit | 3 |
| [{OBX}] | Observation/results | 7 |
| [{AL1}] | Allergy | 3 |

syngo.via tries to find the patient and

- erases values of attributes where the message contains a null value (two adjacent quotation marks “”)
- ignores empty attributes
- updates the below specified attributes (with a non-null value)

**Table 3: Attributes to be updated by a received ADT^A08 message**

| Attribute | DICOM Tag Number | Part of DICOM Module | DICOM Value Representation | HL7 |
|---|---|---|---|---|
| Patients Name* | (0010,0010) | Patient Identification / Patient | PN | ADT PID: 5 |
| Patients Sex | (0010,0040) | | CS | ADT PID: 8 |
| Patients BirthDate | (0010,0030) | | DA | ADT PID: 7 |
| Patients BirthTime | (0010,0032) | | TM | ADT PID: 7 |

| | | | | |
|---|---|---|---|---|
| Other Patient Names | (0010,1001) | | PN (VM 1-n) | ADT PID: 9 |
| Ethnic Group | (0010,2160) | | SH | ADT PID: 10 |
| Allergies | (0010,2110) | Patient Medical | LO | ADT AL1: 3 |

* Patient Name is expected in DICOM format.

If the patient is not found, syngo.via stores the update information. Imaging data which enters the system afterwards and matches the patient demographics within the update message, gets updated while receiving/importing.

Note: this patient update message can be used to update only non-key attributes. To change a key attribute, a “Patient Merge – ADT^A40” or a “Patient Merge (Patient ID Only) – ADT^A34” message has to be issued by the sending application.

### 5.1.2 Patient Merge – ADT^A40

A Patient Merge triggered by an ADT^A40 message indicates that a merge has been done at the internal identifier level. That is, PID-3-patient ID identifier has been merged with MRG-1 Patient ID.

Note: Be aware that the RIS has to send all the attributes which are configured in syngo.via to identify a patient in order to merge the patient.

The table below indicates the message semantics of the ADT^A40 message:

**Table 4: Message semantics of ADT^A40 according to IHE**

| ADT^A40 | Patient Administration Message | Chapter in HL7 |
|---|---|---|
| MSH | Message Header | 2 |
| EVN | Event Type | 3 |
| PID | Patient Identification | 3 |
| MRG | Merge Information | 3 |
| [PV1] | Patient Visit | 3 |

There are two use cases for the patient merge message:

1. Merging of two patient object branches into a single one
   In this case the PID and MRG segments represent two existing patients in the database. After finding the target patient and merge patient (MRG segment), all RPs from the merge patient are moved to the target patient. See Table 6 for an explanation which attributes are changed in this case.

2. Update patient’s key attributes
   the target patient (PID segment) is not found. Only the merge patient (MRG segment) exists. A new patient is created with the key attributes from PID segment and all other fields are populated from the existing merge patient in database. All RPs from the merge patient are moved to the new patient. See Table 5 for an explanation which Patient’s key attributes are changed in this case.

Patients get identified by a configurable combination of fields. The MRG segment only provides the patient name and patient id. Therefore, the syngo.via can only process the message in case the merge patient gets identified unambiguously using these fields.

If the patient with the correct patient identification does not exist, syngo.via modifies only the patient identification attributes:

**Table 5: Attributes which get updated based on Patient Merge**

| Attribute | DICOM Tag Number | Part of DICOM Module | DICOM Value Representation | HL7 |
|---|---|---|---|---|
| **Patients Name** | (0010,0010) | Patient Identification / Patient | PN | ADT PID: 5 |
| Patients ID | (0010,0020) | | LO | ADT PID: 3 |
| Issuer Of Patient ID | (0010,0021) | | LO | ADT PID: 3 |

If the patient with the correct patient identification already exists, syngo.via copies the following attributes from that patient:

**Table 6: Attributes which get updated during Patient Merge**

| Attribute | DICOM Tag Number | Part of DICOM Module | DICOM Value Representation | HL7 |
|---|---|---|---|---|
| Patients Name | (0010,0010) | Patient Identification / Patient | PN | ADT PID: 5 |
| Patients ID | (0010,0020) | | LO | ADT PID: 3 |
| Issuer Of Patient ID | (0010,0021) | | LO | ADT PID: 3 |
| Other Patient IDs | (0010,1000) | | LO (VM 1-n) | ADT PID: 3 |
| Other Patient Names | (0010,1001) | | PN (VM 1-n) | ADT PID: 9 |
| Patient Birth Date | (0010,0030) | | DA | ADT PID: 7 |
| Patient Birth Time | (0010,0032) | | TM | ADT PID: 7 |
| Patients Sex | (0010,0040) | | CS | ADT PID: 8 |
| Ethnic Group | (0010,2160) | | SH | ADT PID: 10 |

### 5.1.3 Patient Merge (Patient ID Only) – ADT^A34

Although IHE specifies, that the ADT^A40 message shall be used for Patient Merge messages, several older systems still use the ADT^A34 ("Merge patient information - patient ID only") message for this purpose.

The difference between the ADT^A40 and the older ADT^A34 is, that the A40 deals with the Patient Identifier List, whereas the ADT^A34 only supports the Patient ID.

syngo.via also supports the ADT^A34 message in order to enhance the interoperability to older RIS as those systems more often support the retired ADT^A34 and do not support the ADT^A40.

The table below indicates the message semantics of the ADT^A34 message:

**Table 7: Message semantics of ADT^A34**

| ADT^A34 | ADT Message | Chapter in HL7 |
|---|---|---|
| MSH | Message Header | 2 |
| EVN | Event Type | 3 |
| PID | Patient Identification | 3 |
| [PD1] | Patient Additional Demographic | 3 |
| MRG | Merge Information | 3 |

Hint: syngo.via treats and analyzes the ADT^A34 in the same way as the ADT1^A40.

# 5.2 Report Import

The ORU message is used for receiving results from other systems and forwarding these results to syngo.via WebReport. With the OBX and the OBR segments, one can construct almost any clinical report as a three-level hierarchy, with the Patient Context within the PID segment at the upper level, an order record within the OBR segment at the next level and one or more observation records within the OBX at the bottom.

## 5.2.1 Unsolicited Report – ORU^R01

**Table 8: General message semantics of ORU^R01 (tags in use)**

| ORU^R01 | Unsolicited Observation Message | Segment used within syngo.via ORU msg | Chapter in HL7 |
|---|---|---|---|
| MSH | Message Header | Yes | 2 |
| { [PID | Patient Identification | Yes | 2 |
| OBR | Observations Report ID | Yes | 7 |
| { [OBX] | Observation/Result | Yes | 7 |

The other tags are not used in the ORU messages by syngo.via.

### 5.2.1.1 Identifying Information

The table below indicates the message semantics of the ORU^R01 message:

**Table 9: Attributes used to identify the patient the report belongs to by a received ORU^R01 message**

| Attribute | DICOM Tag Number | Part of DICOM Module | DICOM Value Representation | HL7 |
|---|---|---|---|---|
| Patients Name* | (0010,0010) | Patient Identification / Patient | PN | ORU PID:5 |
| Patient ID | (0010,0020) | | LO | ORU PID:3 |
| Patients BirthDate | (0010,0030) | | DA | ORU PID:7 |
| Patients Sex | (0010,0040) | | CS | ORU PID:8 |

| | | | | |
|---|---|---|---|---|
| Accession Number | (0008,0050) | Imaging Service Request | SH | ORU OBR:3 |
| Procedure Description | (0032,1060) | Requested Procedure Module | LO | ORU OBR:4 |

#### 5.2.1.1.1 Result Status

The result status (OBR-25) attribute is aggregated across all available OBX-11 segments. In case multiple OBX-11 segments are available, all of those need to be filled with

- F (meaning: “Final: The report has been finalized in the IS)

in order for the report to be treated as finalized by syngo.via WebReport.

#### 5.2.1.1.2 Report Content

The report in plain text format is conveyed within the OBX2-5 Observation Value.

Information about the observation date will be read from OBR-7 Observation Date/Time. It is assumed that this value correlates with the DICOM Study Date (0008,0020). The report date will be read from OBR-22 Results rpt/status chng - date/time. The reason for study will be read from OBR-31.2 and the reading radiologist will be taken from OBR-32 Prinicipal Result Interpreter.

#### 5.2.1.1.3 Example Report

```
MSH|^~\&|RAD|BMH|||301203140327||ORU^R01|RMS|P|2.3.1|<x0D>
PID|1||000999888777|001010126512|LASTNAME1 MIDDLENAM^FIRST^^^|<x0D>
OBR||00003^001|36494140|ULT4476814 ^OB LIMITED FOR VIABL SNGL OR MUL|||2
01003150319||||||||^^^ |067900^DOCTORLN1^FIRSTNM^^^^MD||||||3012031403
27|||F||1^^^^^S^^STAT||||^OB US TO RULE IN PREGNANCY|000000&UNASSIGNED&
DOCTOR&&&&|<x0D>
```

**OBX**|5|TX|36494140&BODY||*****  FINAL  *****~~~REASON FOR EXAM:  OB US TO RULE IN PREG-
NANCY~DIAGNOSIS:  . .~COMMENTS: OB US TO RULE IN PREGNANCY  ~ACC#:  12341234~PROCEDURE: ULT
9876- OB LIMITED FOR VIABL SNGL OR MUL  - Jul 11 2009 ~***  Anywhere Memorial Hospital
~1234 South Sealevel Blvd., Whitest

Beach, TX 12345 Phone: (123) 456-7890 ~Ext 9999  ~----------
----------~-----~Pat. Name: LASTNAME1 MIDDLENAM, FIRST  Study Date:
07/11/2009  3:21am~Pat. No:  999888777  Referring MD: DOCTORLN1, FIRS

TNM~LMP:  Unknown  Sonographer:  SMITHY~NA by US:  08.9 weeks
DOB, Age:  05/05/1990, 19~  GA Selected:  08.9 weeks ~(So-
nographic)~  EDD:  10/18/2010~----------
----------~-----~MEASUREMENTS \T\ FETAL AGE
FETAL GROWTH

EVALUATION~Measurement  GA  Range  Source  % for 08.9 Ratios~---------- ------- -----
------ -------  ---------- ~----------~Sac  3.6 cm 08.7 wk (07.8-09.6) Hellman
Sac  38%~CRL  2.5 cm 09.2 wk (08.5-09.9) Hadlock  CRL  65%~GA for sonogram 08.9 wk (08

.1-09.8)~based on (Sac,CRL) Avg  ~----------
----------~-----~CLINICAL SUMMARY~Fetus Number:single~Fetal Heart Rate: 170
bpm~Yolk Sac seen:yes~Ovaries: wnl~Fibroid seen:NONE~IMPRESSION:~  RADIOLOGIST DICTATED REPORT:
\E\ ~DOCTOR UNASSIGNED~~~Report Dictated by  DOCTOR UNASSIGNED  on: Jul 11 2009  3:23A~Tran-
scribed by:  on Jul 11 2009  3:23A~||||||F|<x0D>

**Report in plain text**

# 6 Outbound Messages

## 6.1 Report Export

The ORU message is used for transmitting results to other systems. With the OBX and the OBR segments, one can construct almost any clinical report as a three-level hierarchy, with the Patient Context within the PID segment at the upper level, an order record within the OBR segment at the next level and one or more observation records within the OBX at the bottom. The message is encoded using the UTF8 encoding.

### 6.1.1 Unsolicited Report – ORU^R01

**Table 10: General message semantics of ORU^R01**

| ORU^R01 | Unsolicited Observation Message | Segment used within syngo.via ORU msg | HL7 Chapter |
|---|---|---|---|
| MSH | Message Header | Yes | 2 |
| { [PID | Patient Identification | Yes | 3 |
| [PD1] | Additional Demographics | No | 3 |
| [{NK1}] | Next of Kin/Associated Parties | No | 3 |
| [{NTE}] | Notes and Comments | No | 2 |
| [PV1 | Patient Visit | No | 3 |
| [PV2] ]] | Patient Visit – Additional Info | No | 3 |
| {[ORC] | Order common | No | 4 |
| OBR | Observations Report ID | Yes | 7 |
| {[NTE]} | Notes and comments | No | 2 |
| [CTD] | Contact Data | No | 11 |
| { [OBX] | Observation/Result | Yes | 7 |
| {[NTE]}} | Notes and comments | No | 2 |
| [{FT1}] | Financial Transaction | No | 6 |
| {[CTI]}}} | Clinical Trial Identification | No | 7 |
| [DSC] | Continuation Pointer | No | 2 |

#### 6.1.1.1 Observation value encoding into HL7:

The syngo.via Report is generated in an XML format prior to being sent to the internal HL7 engine.

For the report in plain text (OBX2-5) the tabs are converted to spaces (0x20) and the linefeed character (0x0A) is replaced with a value of \.br\ by the internal HL7 engine to indicate new lines within the formatted report for the HL7 output.

For the CDA report the study related DICOM attributes are available in the Body section of the CDA within the “DICOM Object Catalog”.

#### 6.1.1.1.1 Result Status

The result status (OBR-25) attribute is filled with

- P (meaning: “Preliminary: A verified early result is available, final results not yet obtained)

For compatibility reasons the information is also transferred in OBX1-11.

#### 6.1.1.1.2 Report Content

The message contains the:

- report in plain text format is conveyed within the OBX2-5 Observation Value
- the report in PDF format is encoded as Base64 string within the OBX3-5 Observation Value
- the structured finding and study information in CDA format is sent within the OBX4-5 Observation Value

#### 6.1.1.1.3 Example Report

```
MSH|^~\&|syngo.via|syngo|ANY_RIS|RIS|201310100812||ORU^R01|2|P|2.3.1||||||UNICODE UTF-8

PID|1||99001||RCTest_001||19611212|F OBR|1||1234|^RCTest
Study01|||20100910132420||||||||||1234|000001||123223|20131007101515||

MR;SR|P||||||reason|&&Dr1

OBX|1|CE|&IMP|1|||||||P

OBX|2|FT|&BODY|2|Diagnostic Imaging Report\.br\\.br\\.br\+------------+--------------------
-----------------------------------------+\.br\\F\Name:       \F\RCTest_001,
\F\\.br\+------------+-----------------------------------+--+-------+----------------
+\.br\\F\Patient ID: \F\99001                              \F\  \F\Sex:   \F\female
\F\\.br\+------------+-----------------------------------+--+-------+----------------
+\.br\\F\Birth Date: \F\12/12/1961                         \F\  \F\Age:   \F\48 years
\F\\.br\+------------+-----------------------------------+--+-------+----------------
+\.br\\.br\Request And Procedure\.br\+-----------------------+--------------------------
-----------------------+\.br\\F\Requested Procedure:    \F\req proc
\F\\.br\+-----------------------+-----------------------------------------------      ------
-+\.br\\F\Accession Number:       \F\1234
\F\\.br\+-----------------------+-----------------------------------------------      ------
-+\.br\+-----------------------+-----------------------------------------------      ------
+\.br\\F\                       \F\9/10/2010
\F\\.br\\F\Study Date and Time:    \F\ at
\F\\.br\\F\                        \F\13:24:20
\F\\.br\+-----------------------+-----------------------------------------------      ------
-+\.br\\F\Study Description:      \F\RCTest Study
```

**Report in plain text**

```
01                                  \F\\.br\+-----------------------+-----------------
---------------------------------+\.br\\.br\Technique\.br\\.br\Clinical Information\.br\\.br\Findings Summary\.br\\.br\+-------------------------------------+---------
----------------------------+\.br\\F\Name                                \F\Value
\F\\.br\+-----------------------------------+-----------------------------------
```

```
+\.br\\F\[1] Distance Line                    \F\7.75 cm
\F\\.br\+-------------------------------------+-------------------------------------
+\.br\\.br\Impression\.br\\.br\+----------------------+-+---------------------------------
------------------+\.br\\F\Reading Physician:    \F\ \F\, Dr1
\F\\.br\+----------------------+-+-----------------------------------------------------
+\.br\\.br\Findings Details\.br\\.br\+-----------------------------------------------------
----------------------+\.br\\F\Finding [1] Distance Line:
\F\\.br\+------+-----------------------------------------------------------------------
+\.br\\F\Value \F\7.75 cm
\F\\.br\+------+-----------------------------------------------------------------------
+\.br\\F\
\F\\.br\+-----------------------------------------------------------------------------
+\.br\\F\                                [Img]
\F\\.br\+-----------------------------------------------------------------------------
+\.br\\F\
\F\\.br\+-----------------------------------------------------------------------------
+\.br\\F\
\F\\.br\+-----------------------------------------------------------------------------
+\.br\||||||P
```

```
OBX|3|FT|&BODY|3|JVBERi0xLjUNCjUgMCBvYmoNCjw8L1R5cGUgL1BhZ2UvUGFyZW50IDMgMCBSL0NvbnRlbnR-
zIDYgMCBSL01lZGlhQm94IFswIDAgNjEyIDc5Ml0||||||P
```

**Report in PDF (Base64 encoding, truncated sample)**

```
OBX|4|FT|&BODY|1|<?xml version="1.0" encoding="UTF-8"?><ClinicalDocument xmlns="urn:hl7-
org:v3" xmlns:voc="urn:hl7-org:v3/voc" xmlns:xsi="http://www.w3.org/2001/XMLSchema-in-
stance"><!--**************************************--><!--             CDA Header
--><!--**************************************--><typeId root="2.16.840.1.113883.1.3" exten-
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ily></name><administrativeGenderCode codeSystem="DCM" code="F" /><birthTime
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thor><custodian><assignedCustodian><representedCustodianOrganization><id
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latedDocument><!--**************************************--><!--
```

**Report in CDA (truncated sample)**

### 6.1.1.2 Observation request segment

OBR segment includes the following fields:

**Table 11: Fields of OBR segment**

| HL7 | Meaning |
|---|---|
| OBR-3 | Accession number |
| OBR-18 | Accession number |
| OBR-19 | Study ID |
| OBR-21 | Requested Procedure ID (if available) or Preformed Procedure ID |
| OBR-24 | Modality |
| OBR-31 | reason of requested procedure |

# 7 Required attributes

Following fields are required by syngo.via.

The attributes marked as required are checked when ADT or ORU messages enter the system and if not present or exceeding the acceptable length, they are stored within the backlog of the HL7/XML interface of syngo.via.

## 7.1 ADT

**Table 12: required fields of ADT messages**

| HL7 | Meaning | Required |
|---|---|---|
| MSH-07 | Date/Time Of Message | |
| MSH-09 | Message Type | Yes |
| MSH-10 | Message Control ID | |
| MSH-12 | Version ID | Yes |
| PID-03.01 | Patient Identifier List / ID | Yes (max. 64 char) |
| PID-04 | Alternate Patient ID | |
| PID-05 | Patient Name | Yes (max. 64 char) |
| PID-07 | Date Of Birth | |
| PID-08 | Administrative Sex | |
| PID-09 | Patient Alias | |
| PID-18.01 | Patient Account Number / ID | |
| PID-18.04 | Patient Account Number / Assigning Authority | |
| MRG-01.01 | Prior Patient Identifier List | Yes (max. 64 char) |
| MRG-04.01 | Prior Patient ID | |
| MRG-07 | Prior Patient Name | |
| PV1-02 | Patient Class | |
| PV1-03 | Assigned Patient Location | |
| PV1-06 | Prior Patient Location | |
| PV1-08 | Referring Doctor | |
| PV1-15 | Ambulatory Status | |

| | | |
|---|---|---|
| PV1-19 | Visit Number | |
| PV1-21 | Charge Price Indicator | |
| PV1-44 | Admit Date and Time | |
| PV1-45 | Discharge Date and Time | |

# 7.2 ORU

**Table 13: required fields of ORU (Report Import) messages**

| HL7 | Meaning | Required |
|---|---|---|
| MSH-07 | Date/Time Of Message | |
| MSH-09 | Message Type | Yes |
| MSH-10 | Message Control ID | |
| MSH-12 | Version ID | Yes |
| PID-03.01 | Patient Identifier List / ID | Yes (max. 64 char) |
| PID-04 | Alternate Patient ID | |
| PID-05 | Patient Name | Yes (max. 64 char) |
| PID-07 | Date Of Birth | |
| PID-08 | Administrative Sex | |
| OBR-03.01 | Filler Order Number | Yes (max. 16 char) |
| OBR-04 | Universal Service ID | |
| OBR-07 | Observation Date/Time | Strongly Recommended |
| OBR-22 | Results rpt/status chng - date/time | Strongly Recommended |
| OBR-25 | Result Status | Yes |
| OBR-31.2 | Reason For Study | Strongly Recommended |
| OBR-32 | Principal Result Interpreter | Strongly Recommended |
| OBX-02 | Value Type | Yes |
| OBX-05 | Observation Value | Yes (max. 655236*1) |

[1] The length of the observation value field is variable, depending upon value type. See *OBX-2-value type*.

| | | |
|---|---|---|
| OBX-11 | Observation Result Status | Yes |

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