# *syngo*® Dynamics

Online Help - HL7 Interface Specifications Manual (Standalone)

VA41

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# 1 Intended Use/Intended Purpose

## 1.1 Intended Use/Indications for Use Statement

*syngo* Dynamics is a multimodality, vendor agnostic Cardiology image and information system intended for medical image management and processing that provides capabilities relating to the review and digital processing of medical images.

*syngo* Dynamics supports clinicians by providing image post-processing functions for image manipulation, and/or quantification that are intended for use in the interpretation and analysis of medical images for disease detection, diagnosis, and/or patient management within the healthcare institution's network.

*syngo* Dynamics is not intended to be used for display or diagnosis of digital mammography images in the U.S.

## 1.2 Intended Purpose Statement

**Intended Purpose Statement under the European Medical Device Regulation 2017/745:**

Software solutions intended to process, communicate, display, read, and archive medical data for informing and driving clinical management.

## 1.3 Indications

*syngo* Dynamics supports clinicians by providing image post-processing functions for image manipulation, and/or quantification that are intended for use in the interpretation and analysis of medical images for disease detection, diagnosis, and/or patient management within the healthcare institution's network.

*syngo* Dynamics is not indicated for any specific disease, condition, patient population.

## 1.4 Contraindications

*syngo* Dynamics is not intended to be used for display or diagnosis of digital mammography images in the U.S.

There are no known clinical contraindications for *syngo* Dynamics.

# 2 Responsibility Statement

The evidence-based reporting in *syngo* Dynamics is intended to be a supporting tool for the diagnosing physician. Physicians should look at all relevant images and measurements prior to concluding on a diagnosis. While Siemens Healthineers may provide sample templates for user customization, the accuracy and appropriateness of clinical phrases, clinical observations, and user-defined measurements and calculations in *syngo* Dynamics worksheets and reports are the responsibility of the diagnosing physician and/or facility.

All quantitative data ranges are derived from the clinical experience of echocardiology laboratories and are included in observation libraries for *syngo* Dynamics users. Siemens Healthineers strongly recommends that clinicians review these ranges with their individual diagnostic needs in mind prior to using *syngo* Dynamics for clinical reporting.

Any serious incident that has occurred in relation to the device must be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

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# 3 Introduction

*syngo* Dynamics is aimed at providing physicians and staff with fast, easy access to important patient data. *syngo* Dynamics has made the all-digital cardiology department a practical reality, incorporating images and information from echocardiography, cardiac catheterization, nuclear medicine, OB, and ultrasound departments. Ease of use, customizable reporting templates, and clinical tools all combine to provide our customers with improved workflow efficiencies and help provide optimal patient care. *syngo* Dynamics supports a streamlined, rapid and efficient decision-making process based on better and more accessible information.

For better readability, we refer to the user in the masculine form.

All parameters and images shown in this document are examples. Only the parameters displayed in your system are definite. All names and data of patients and institutions that are used in this document are entirely fictional. Any resemblance to names of existing people or organizations past or present is entirely coincidental.

Configuration-dependent designations are names of drives, network nodes, and databases. The names that are used in this document are usually not the same as the designations to be found on a particular installation of the system in a clinical environment. For confidentiality reasons, some of the data may have been masked in the images.

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# 4 Legal Notes

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## 4.1 User Profile

Please note that the following profiles may vary in practice depending on (hospital) organization, qualification, and personal responsibilities and can only be considered as a general guide.

The following profiles may vary depending on the site, qualifications, and personal responsibilities. They should be considered general guides.

**Technologist**

**Cath Lab Technologist:** The cardiac technician, RCVT or RN assists in performing the cath lab exam. The tech is usually responsible for documenting the procedures performed in the cath lab, such as techniques and equipment used. He enters patient information associated with the report, records measurements, documents hemodynamics, and produces the procedural report.

**Cardiac Sonographer:** The sonographer performing the echo exam (US workflow model). The sonographer enters patient information associated with the report, performs measurements on images, and produces a preliminary report.

**Vascular Technologist:** The sonographer performing the exam. The sonographer enters patient information associated with the report, performs measurements on images, and produces a preliminary report.

**Radiologic Technologist:** The radiology technician captures the images for the exam and satisfies the procedure step for the patient.

**OB/GYN and MFM Sonographer:** The OB/GYN and MFM (Maternal Fetal Medicine) sonographer performs the exam and, in some cases, assists the physician with creating the reports.

**Physician**

**Cath Lab Cardiologist:** The cardiologist performing the cath lab exam and producing reports of the procedure for their records, for the patient, and for the referring physician.

**Cardiac Surgeon:** The cardiac surgeon who reviews images and/or reports before surgery.

**Echo Cardiologist:** The cardiologist performing the echo exam and producing reports of the procedure for their records, for the patient, and for the referring physician.

**Vascular Lab Physician:** The physician performing the exam and producing reports of the procedure for their records, for the patient, and for the referring physician.

**Radiologist:** The radiologist reads the images captured by the technician and produces reports for the referring physician and for their own records.

**OB/GYN and MFM Physician:** The OB/GYN and MFM physician reads the exam and creates the reports.

**Clinical Administrator**

The clinical administrator configures application settings, DICOM nodes, archiving, and manages short term storage and licenses, performs patient data administration, and is the first support contact for reading physicians.

The clinical administrator is an application specialist who has work experience, product experience, and knowledge of the clinical workflow and is English speaking.

**IT Administrator**

The IT administrator is responsible for data security, data protection, user management, configuration of DICOM nodes, as well as backup and archiving. The IT administrator manages the IT infrastructure of the clinical network and is responsible for the administration and configuration of IT components.

The IT administrator must have expert knowledge of networks, operating systems, user administration, and knowledge of the workflow and is English speaking.

**Siemens Healthineers Service**

The Siemens Healthineers Service user role is responsible to restore the normal system operation as fast as possible while minimizing adverse impact on the customer's business operation.

They are responsible for trouble shooting hardware and software issues identified by end customers.

They must have expert knowledge of networks, operating systems, user administration, and knowledge of the workflow.

They must have Product Experience, Professional Education or work experience and Product training certificate or comparable.

## 4.2 Training

*syngo* Dynamics can be used intuitively. Nevertheless, a training course tailored to your specific user situation is mandatory.

To enable users to routinely operate the *syngo* Dynamics system and give them the necessary theoretical and practical experience for the efficient usage, different kinds of training are available:

- User documentation packaged as part of the *syngo* Dynamics software package
- Integrated Help, which is part of the respective application
- Classroom trainings which take place at the Siemens Healthineers Training Centers
- On-site trainings which provide the most intensive training for you. The trainings are conducted by trainers from the local Siemens Healthineers organization. On-site trainings can be optionally extended depending on your specific needs.
- Healthcare professional will get access to PEPconnect – the Siemens Healthineers learning platform – so that they can expand and improve their knowledge at their own pace, anytime, anywhere. See pep.siemens-info.com, and search for *syngo* Dynamics to see relevant e-learning contents.
- See www.siemens-healthineers.com. Select your country and then select the category **Education & Training**.

If you require an additional training, please contact your local Siemens Healthineers Sales Representative.

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# 5 Documentation Overview

The *syngo* Dynamics software offers several levels of user assistance, beginning with tooltips on the screen, and accompanied by the basic Online Help and Operator Manual.

The Online Help documents are available only in English and applicable for the tools and applications designed to be used with/for the *syngo* Dynamics software. The Operator Manuals, if available, may be localized and contain safety advisories and information on frequently-used user interaction.

## 5.1 Conventions Used in this Documentation

To help you find and understand the appropriate information, the following visual orientation aids are used.

| | |
|---|---|
| ◆ | One-step operation |
| **1** | Operating sequence |
| ■ | List item |
| ➜ | Guidelines |
| Bold letters | Any user interface item, such as Window titles, menu items, function names, field names, and buttons are written in bold letters |
| | Note for optimal handling |
| Screenshots | Screenshots that are intended to illustrate general principles are shown in a neutral form for greater simplicity. Screenshots that illustrate instructions contain text to show the context within the application. |

## 5.2 Labeling of Safety Advices

Cautions are specially marked in the documentation.

The content of a caution is structured in three different sections:

- Source of danger
- Consequence
- Countermeasure

**Caution** CAUTION indicates potential risk that may result in minor physical injury or material damage.

CAUTION

First, the source of danger is addressed!

**Then, possible consequences are described.**

◆ Finally, measures are given to prevent a dangerous situation.

## 5.3 Safety Advisory

All safety advisories that users need to consider for the use of *syngo* Dynamics are noted in the *syngo* Dynamics Safety Advisory manual. Refer to this manual specific to the software version installed at your hospital.

Additionally, all safety advisories applicable in an application workflow are indicated in the respective manual where the workflow is described.

## 5.4 About this Manual

This manual contains information on HL7 specifications required for interfacing with *syngo* Dynamics.

# 6 HL7 Overview

## 6.1 Purpose

This document provides the requirements to interoperate with *syngo* Dynamics using the Health Level Seven (HL7) standard. As per STIG V-76761, it is recommended that you disable TLS 1.1 and lower versions. It is also recommended that you enable TLS 1.2. All inbound HL7 communication is supported on TLS 1.2.

The objective of this document is to provide a standard set of Hospital Information System (HIS) requirements to support the following features:

- Report Upload

  The *syngo* Dynamics system components communicate observation reporting information to the Cerner OPENLink Engine via a proprietary communications protocol. The Cerner OPENLink Engine constructs the HL7 message from information supplied by the *syngo* Dynamics workstation.

- ADT/Order Messages

  This specification provides the *syngo* Dynamics baseline requirements for a Hospital Information System (HIS) to effectively send ADT/Order messages.

- HL7 Study Reconciliation of PHI (Protected Health Information) Data

  When *syngo* Dynamics is integrated with Electronic Health Record System (EHR) and the necessary configurations exist in the **Server Configuration Tool** (**HL7 interface** and **Enable EHR** are selected), Protected Health Information (PHI) data pertaining to studies are synchronized in both systems whenever there are updates to the study data.

  On arrival of a HL7 message to *syngo* Dynamics Server from the Electronic Health Record System (EHR), the HL7 message is cached and queued. The queue is continuously processed for reconciliation.

**ORM reconciliation**

For an ORM message, the images are sent to *syngo* Dynamics from EHR PACS server. The patient information from the images is associated and reconciled to a matching order (ORM) based on the Study Instance UID or ORM matching rules configuration in the Site IDs tab in SysAdmin. For order association, a study must undergo successful demographic reconciliation. Note that the order association is based on a study date range which is configured on the server for all departments. Contact Siemens Healthineers Customer Care for study date range configuration.

When the study type is modified on the worksheet and the study has had demographic reconciliation, the system updates the order association based on the updated study type.

If configured, the user is prevented from verifying a report and/or marking the study as read when an order cancellation has been received for the order associated with the study.

**Procedure type to department mapping**

Mapping procedure type to department is a prerequisite for the studies (pre-procedure or new study from EHR) to be associated to a *syngo* Dynamics department. The ORM message contains the procedure type information. The study is assigned to the configured department based on the procedure type to department mapping in the **Server Configuration Tool**. If no mapping exists, the study is assigned to Default department. Contact your system administrator if this is not done. Your system administrator must contact Siemens Healthineers Customer Care to ensure all "default" studies are assigned to a specific department.

**Study correction**

If the study is associated with an incorrect order that needs to be corrected, *syngo* Dynamics supports study UID correction via HL7 ORM O01 messages sent by EHR. The ZSU segment contains details of the old and new study UID. The study UID correction is done on the study with the old study UID.

For studies that went through study UID correction, the studies are associated with a new order ORM message. The match is based on the new study UID or Accession number present in the ORM message sent for the study correction. If there are multiple matching ORM messages, then the latest ORM is associated with the study. The studies are then reconciled with the new order ORM message, which in turn might lead to patient-level demographics update.

If the new study UID from the study UID ORM message exists in *syngo* Dynamics, the old study is merged to the new study. On successful study merge, all information (image data, image series data, and report) pertaining to the source study is moved to the target study. The merged studies are updated with the target study details.

Audit messages are logged when study UID correction is done and when a study is merged.

In the integrated environment, the following messages are displayed if a study is open with read-write access.

**Study cannot be edited as study is merged to Patient ID <number>** - Indicates that merge is in progress. The open source study changes to read-only mode.

**Study merge has occurred, please reload the study** - Indicates that the target study is open with read-write access, and merge has occurred.

In DICOM Image Review, you shall receive the same message for similar situations, but with the **OK** button.

If the study UID correction at your site is via HL7 ORM message, ensure that EHRHL7BasedStudyUpdate is set to **TRUE** in HL7CacheConfiguration.xml. This .xml file is present in <Server>\F:\Acuson\Configuration\HL7Cache\HL7CacheConfiguration.xml. By default, the EHRHL7BasedStudyUpdate is set to FALSE. This can be retained to be FALSE if the study UID correction is via DICOM.

**Patient merge**

In situations where the synchronization warrants patient data to be merged with existing patient, the ADT HL7 message when sent with merge segment is processed only if a matching study is found on the *syngo* Dynamics server.

The matching study is identified based on the matching rules specified in the HL7PatientIdentification.xml on the server in the location <Server>\F:\Acuson\Configuration. By default, **Patient ID** and **Site ID** are used for Patient Identification. The System Administrator can modify the HL7PatientIdentification.xml to modify the default values to contain only **Patient ID**, as applicable for the hospital site. When a match is found, all information (image data, image series data, and report) pertaining to the source patient is moved to the target patient. The merged patient demographics are updated with the target patient demographics. Audit messages are logged when patient information is merged. When studies being merged are already open in *syngo* Dynamics, the following message is displayed indicating about the merge – **Patient demographics updated and able to continue with the reading of the study**. Patient level demographics are updated for both current and prior studies.

Audit messages are logged when patients are merged.

**Errors during merge**

If the merge fails (report merge or image merge), the source study is retained. If report merge succeeds and image merge fails, the target study contains the merged reports along with the images (partial set). Prober logs are maintained for such merge failures.

**Patient Demographics Update**

PHI data of the studies in *syngo* Dynamics is automatically reconciled with the corresponding procedure of the EHR through a HL7 ADT message from EHR. Automatic reconciliation is done only for the EHR linked studies.

The HL7 message is processed only if a matching study is found on the *syngo* Dynamics server. The matching study is identified based on the patient identification fields configured in the HL7PatientIdentification.xml on the server in the location <Server>\F:\Acuson\Configuration. Matching criteria can be **Patient ID** and **Site ID**/**Patient ID** only. The **Site ID** should be configured for a department in SysAdmin. By default, **Patient ID** and **Site ID** is used for patient identification. On successful processing of the HL7 message, PHI data of the study automatically reconciles with the updates from the HL7 message.

During reconciliation, patient level demographics are updated for both current and prior studies. When reports are opened in Reporting component, demographic updates can be seen on reports if the reports are in unlocked state. For a locked report, users must unlock the report to see the demographics updates.

The following fields are auto reconciled as part of HL7 ADT update: **Last Name, First Name, Middle Name, Prefix,Suffix, Gender, Date of Birth**.

When a study being updated with the PHI is already opened, Reporting is automatically refreshed with the updated PHI data and the user is notified with the message - **Patient Demographics Updated**.

The demographic data is not updated for the following conditions.

- Study is marked as Read with lock enabled.
- Report is locked and Verified.

**Using the HL7 Reconciliation Tool**

Use the HL7 Reconciliation Tool to reconcile ORM and ADT messages for non-EHR studies. You may also use the HL7 Reconciliation Tool to manually reconcile ORM/ADT message updates for EHR studies for which reconciliation has failed.

## 6.2 Scope

This document specifically refers to *syngo* Dynamics VA41 server and workstations and the supported Cerner OPENLink component version.

## 6.3 Abbreviations

| | |
|---|---|
| (DR) | Short for Demographic Reconciliation in this document. |
| (OA) | Short for Order Association in this document. |
| ACK | Acknowledgment |
| ADT | Patient administration messages within the HL7 standard. Typically initiated by the HIS to inform ancillary systems that a patient has been admitted, discharged, transferred, merged, that other demographic data about the patient has changed (name, insurance, next of kin, etc.) or that some visit information has changed (patient location, attending physician, etc.). |
| ADT^A01 | An HL7 Admit/Discharge/Transfer message for Patient Admit. This occurs when the patient is admitted to the hospital. |
| ADT^A04 | An HL7 Admit/Discharge/Transfer message for Patient Registered. This occurs when the patient is registered at the hospital. |
| ADT^A08, ADT^31 | An HL7 Admit/Discharge/Transfer message for Patient Update. This occurs when the patient's demographic information has been updated from what was previously sent when the patient was admitted.<br>An A31 event can be used to update person information on an MPI. It is similar to an A08 (update patient information) event, but an A08 (update patient information) event should be used to update patient information for a current episode. A31 can also be used for back-loading MPI information for the patient or for back-loading patient and historical information. |
| ADT^A18, A34, A40 | An HL7 Admit/Discharge/Transfer message for Patient Merge. These are used when two different identifications for the same patient are found and need to be merged into one identification. |
| AL1 | Allergy Information |
| All servers | For the purposes of this document, the term "all servers" refers to all *syngo* Dynamics servers that are included in the multi-server login configuration of the current server. |
| CA | The order control code for the order that is canceled. It is used in ORC segment of HL7 ORM Message |
| DDI | Data Dictionary Item |

| | |
|---|---|
| DG1 | Diagnosis |
| DOB | Patient date of birth |
| Enterprise | For the purposes of this document, the term “enterprise” refers to the collection of all departments on all servers that are included in the multi-server login configuration of the current server.<br>The scope of “enterprise” is not defined as all departments of all *syngo* Dynamics servers that are physically located in an institution.<br>Each *syngo* Dynamics server within an institution server pool has its own enterprise scope, as the scope is defined by the multi-server login configuration of that individual server. |
| FON | Short for Filler Order Number in this document - The order number assigned to the Service Request by the party filling the order. |
| HIS | Health Information System |
| HIS Verification | A method used by the *syngo* Dynamics Server’s Vault services to reconcile patient/study information by using a DICOM Modality Worklist Server to confirm scheduled study data. |
| HL7 | Specific message standards created by the Health Level Seven organization for the exchange, management and integration of electronic healthcare information. |
| IE | Interface Engine |
| IP | Internet Protocol |
| M | Mandatory |
| MDM | Medical Document Management<br>Helps managing medical records by transmitting new or updated documents, or by transmitting important status information and/or updates for the record. |
| Master Patient Index | Master Patient Index (MPI) is an index which references all existing patients registered at a health care organization in such manner that each patient is logically represented only once and can be uniquely identified. Use of MPI allows clinical and demographic information to be cross-referenced between different facilities within the enterprise of a health care organization.<br>MPI can be a specific SID/PID pair among all SID/PID pairs that are assigned to a patient. For example, for a health care organization that defines “EPI” as the MPI SID, the value “123456789^^^EPI” indicates it is a MPI and “123456789” is the MPI PID. |

| | |
|---|---|
| MPI | Master Patient Index (MPI) is an index which references all existing patients registered at a health care organization in such manner that each patient is logically represented only once and can be uniquely identified. Use of MPI allows clinical and demographic information to be cross-referenced between different facilities within the enterprise of a health care organization.<br>MPI can be a specific SID/PID pair among all SID/PID pairs that are assigned to a patient. For example, for a health care organization that defines "EPI" as the MPI SID, the value "123456789^^^EPI" indicates it is a MPI and "123456789" is the MPI PID. |
| MRG | Merge |
| MRN | Medical Record Number in HL7 (Same as Patient ID in DICOM) |
| MSH | Message Header |
| NACK | Negative Acknowledgment |
| NK1 | Next of Kin |
| NW | The order control code for new order that is used in ORC segment of HL7 ORM Message |
| O | Optional |
| OBR | The Observation Request segment that HL7 ORM message uses to transmit information specific to an order for a diagnostic study or observation, physical exam, or assessment. |
| ORC | The Common Order segment that HL7 ORM message uses to transmit fields that are common to all orders |
| ORM^O01 | An HL7 General Order Message. Also referred to as an "Order" or "HL7 Order" in this document. |
| ORU | Observation Result that provides clinical observations in response to an order. ORU messages provide structured patient-oriented clinical data between systems. |
| PID | Patient ID or refers to the patient identification segment in a HL7 message. |
| PON | Short for Placer Order Number in this document - the order number assigned to the Service Request by the party placing the order. |
| PV1 | Patient visit segment in a HL7 message which includes the patient class. |
| RP-RO | The order control code used for the order that is replacing the previous one. It is used in ORC segment of HL7 ORM Message. For each replacement order, ORC segment use ORC-1-order control value of RP, followed by another ORC segment with ORC-1-order control value of RO. |
| SID | Site ID. Another name for an Assigning Authority (e.g. an Information System) from the HL7 Standard. |
| SID/PID | A Site ID and Patient ID combination. |

| | |
|---|---|
| SIU | Scheduling Information Unsolicited |
| UI | User Interface |

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# 7 HL7 Study Reconciliation of PHI Data

Access the **HL7 Reconciliation Tool** to associate orders with studies and reconcile studies. For complete information on how to perform the HL7 study reconciliation of PHI (Protected Health Information) data, refer to the *syngo* Dynamics HL7 Reconciliation Tool Manual specific to the software version installed at your hospital.

These order associations and demographic reconciliations can also be broken.

**Break order association**

In *syngo* Dynamics, an associated order with a study is broken in the following situations.

- An ORM "cancel" order is received and the **BreakOrderReconOnCancelOrder** variable is set to **True** in sdConfig.xml file.
- Study type is modified.
  However, if a new ORM is found that matches the study type, the study is re-associated automatically with the new order.
- Break the order association manually from Study List. For more information, refer to the *syngo* Dynamics Workplace Manual specific to the software version installed at your hospital.

**Break reconciliation**

In *syngo* Dynamics, a demographic reconciliation that was done in error can be broken manually from Study List. When a reconciliation is broken, all order associations with the study will be broken too. For more information, refer to the *syngo* Dynamics Workplace Manual specific to the software version installed at your hospital.

CAUTION

Demographic data which was stored in a *syngo* Dynamics study during reconciliation is replaced with the demographic data from Sensis when a *syngo* Dynamics study that is linked with Sensis is opened at the Workplace. Incorrect prior studies may be identified when the study is displayed in syngo Dynamics if Sensis and *syngo* Dynamics do not receive HL7 messages from the EHR at the same time.

**Misdiagnosis: Incorrect prior studies are displayed for a sensis study which is opened in sD when the Sensis changes the demographic data in the study.**

- To prevent the display of incorrect priors and potential misdiagnosis, mark the study as read in *syngo* Dynamics to persist the Sensis data in the *syngo* Dynamics database and then use the **Break Reconciliation** feature and the HL7 Reconciliation Tool to correct the patient demographic data.

# 8 Pre-procedural Documentation

Pre-procedural documentation help you document patient-related data ahead of the planned procedure. Pre-procedural documentation cannot be done for existing studies.

When *syngo* Dynamics is integrated with an Electronic Health Record System (EHR) and the necessary configurations exist in the **Server Configuration Tool**, you can create pre-procedural documentation for the matching inbound ORM messages. Information from the ORM messages are mapped to the *syngo* Dynamics database and the corresponding values updated in the *syngo* Dynamics worksheet and report. The matching is based on Study Instance UID or Accession Number. This helps in pre-procedural reporting.

Additionally, in an EHR-integrated environment, if UTC (Coordinated Universal Time) is included in the Observation Date/Time field in the HL7 message, the time is converted per the Server time and associated with the pre-procedural documentation.

Refer to the following:

- For further information on order mapping, refer to "Order Messages (ORM) Mapping" on page 57.
- For more information on pre-procedural documentation, refer to *syngo* Dynamics System Administration Manual specific to the software version installed at your hospital.
- For information on entering pre-procedural documentation for unscheduled procedures, refer to *syngo* Dynamics Workplace Manual specific to the software version installed at your hospital.

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# 9 Report Upload to OPENLink Option

## 9.1 HL7 Message Details Message Specifications

The HL7 outgoing observation reporting interface on the Cerner OPENLink Engine allows the *syngo* Dynamics system to transmit structured patient-oriented clinical data to external systems via unsolicited messages. The standard used by the Cerner OPENLink Engine is a subset of the HL7 Standard, version 2.3.1.

The Observation Reporting transaction set is used to transmit results of diagnostic studies from the *syngo* Dynamics system to interested information systems. Transactions are initiated by the filler application using the ORU message to provide the recorded observation. A single trigger event is used by the Observation Reporting transaction set.

R01: Unsolicited Transmission of Observation

This message is generated by the Cerner OPENLink Engine to provide reports from the *syngo* Dynamics system to the Information System. The *syngo* Dynamics workstation provides the report information to the Cerner OPENLink Engine using a proprietary communication interface.

The following table lists the ORU Message Type Events.

| Event Code | Event Description | Message |
|---|---|---|
| R01 | Unsolicited Transmission of Observation | MSH |
| | Report (Preliminary, Final, or Corrected) | PID |
| | | OBR |
| | | {OBX} |

## 9.2 *syngo* Dynamics Report Format

The *syngo* Dynamics Report is generated in an XML format prior to being sent to the Cerner OPENLink Engine. Tabs are converted to spaces (0x20) in the XML output. The linefeed character (0x0A) is replaced with a value of \.br\ by the OPENLink Engine to indicate new lines within the formatted report for the HL7 output.

The *syngo* Dynamics Report may contain HL7 message delimiters in the report text. To ensure an HL7 compliant character set is sent by the Cerner OPENLink Engine, the delimiter characters will be replaced using the table below. The default values are shown. Site-defined substituted character strings are supported.

The following table contains information on the HL7 Delimiter Substitution.

| Message Delimiter | ASCII Character | Substituted Character String |
|---|---|---|
| Field Separator | \| | \F\ |
| Component Separator | ^ | \S\ |
| Subcomponent Separator | & | \T\ |
| Repetition Separator | ~ | \R\ |
| Escape Character | \ | \E\ |

The entire report text is inserted into a single OBX segment. This must be supported by the receiving system.

## 9.3 Default Segment Listing

The following tables list the HL7 segments and their corresponding data elements that are used by this Report Upload Interface.

Message Header Segment (MSH):

| Seq | Type | Element Name | *syngo* Dynamics Element | Notes |
|---|---|---|---|---|
| 1 | ST | Field Separator | NA | Default Value: \| |
| 2 | ST | Encoding Characters | NA | Default Value: ^~\& |
| 3 | HD | Sending Application | NA | "KinetDx" |
| 4 | HD | Sending Facility | KinetDxHospitalName | Configured *syngo* Dynamics Hospital Name* |
| 5 | HD | Receiving Application | NA | Optional |
| 6 | HD | Receiving Facility | NA | Optional |
| 7 | TS | Date/Time of Message | NA | NA |
| 9 | CM | Message Type | NA | ORU^R01 |
| 10 | ST | Message Control ID | NA | Unique number |
| 11 | PT | Processing ID | NA | P sent as default |
| 12 | ID | Version ID | NA | 2.4 - for ORU<br>2.5 - for MDM |
| 18 | ID | Character Set | NA | Default Value: ISO_IR 100 |

*This field is currently populated with the study institution name.

**Patient Identification Segment (PID)**:

| Seq | Type | Element Name | *syngo* Dynamics Element | Notes |
|---|---|---|---|---|
| 1 | SI | Set ID | NA | 1 |
| 3 | CX | Patient ID (external) | Patientid | DICOM Patient ID |
| 5 | XPN | Patient Name | PatientName | DICOM Patient Name* |
| 7 | TS | Date/time of birth | PatientBirthDate | |
| 8 | IS | Sex | PatientSex | M, F, or O |

*This field is currently sent with the DICOM PN encoding rules.

**Observation Request Segment (OBR)**:

| Seq | Type | Element Name | *syngo* Dynamics Element | Notes |
|---|---|---|---|---|
| 1 | SI | Set ID | NA | 1 |
| 3 | EI | Filler Order Number | AccessionNumber | DICOM Accession Number |
| 4 | CE | Universal Service ID | '^' + StudyDescription | DICOM Scheduled Procedure Step Description. OPENLink to concatenate and add SubComponent Separator |

| Seq | Type | Element Name | *syngo* Dynamics Element | Notes |
|---|---|---|---|---|
| 7 | TS | Observation Date/Time | StudyDate + StudyTime | DICOM Study Date + Study Time (Concatenate Values) |
| 22 | TS | Results rpt/status change date/time | ReportDate + ReportTime | Date/Time Report uploaded from Workstation (Concatenate Values) |
| 25 | ID | Results Status | ReportStatus | F – If *syngo* Dynamics status is Read<br>P – If *syngo* Dynamics status is Completed<br>C – If *syngo* Dynamics report has been amended or corrected |
| 32 | CM | Principal result interpreter | PhysicianReadingStudy | *syngo* Dynamics Diagnosing Physician Name* |

*This field is currently sent with the DICOM PN encoding rules.

**OBX – Observation/Result Segments**:

OBX1 – Impressions

| Seq | Type | Element Name | *syngo* Dynamics Element | Notes |
|---|---|---|---|---|
| 1 | SI | Set ID | NA | 1 |
| 2 | ID | Value Type | CE | Default value depending on the report section<br>CE = Impression |
| 3 | CE | Observation Identifier | AccessionNumber&IMP | OPENLink to concatenate and add SubComponent Separator |
| 5 | * | Observation Value | Text | Contains *syngo* Dynamics Impressions Text. OPENLink to concatenate and add SubComponent Separator. Text value should be “HL7 Safe” |
| 11 | ID | Observation Result Status | ReportStatus | Same as OBR-25 (F, P, C) |

**OBX2 – Report Text**

| Seq | Type | Element Name | *syngo* Dynamics Element | Notes |
|---|---|---|---|---|
| 1 | SI | Set ID | NA | 2 |
| 2 | ID | Value Type | FT | Default value depending on the report section<br>FT = Report or Addendum |

| Seq | Type | Element Name | *syngo* Dynamics Element | Notes |
|---|---|---|---|---|
| 3 | CE | Observation Identifier | AccessionNumber&GDT | OPENLink to concatenate and add SubComponent Separator |
| 5 | * | Observation Value | Text | Contains *syngo* Dynamics Report Text. Text value should be “HL7 Safe” |
| 11 | ID | Observation Result Status | ReportStatus | Same as OBR-25 (F, P, C) |

**OBX3 – Addendum**

| Seq | Type | Element Name | Notes |
|---|---|---|---|
| 2 | ID | Value Type | FT |
| 3 | CE | Observation Identifier | DICOM Accession Number&ADT |
| 5 | * | Observation Value | Contains *syngo* Dynamics Addendum Text |
| 11 | ID | Observation Result Status | Same as OBR-25 (F, P, C) |

## 9.4 Report Upload Message Examples

The following examples contain information on *syngo* Dynamics Report with standard linefeed substitution.

**Final Report**

MSH|^~\&|KinetDx|Ann Arbor Lab|Broker|Connectivity Lab|20030305105716||ORU^R01|00002455|P|2.2||||||ISO_IR 100

PID|||M555||SUMNER^ALEX^WILLIAM||19680212|M|

OBR|1||275|^Adult Heart|||20030305120744|||||||||||||20030305162300|||F||||||

|Welby^Marcus^T

OBX|1|CE|275&IMP||^Acute MI unspecified site, initial episode of care-410.91||||||F

OBX|2|FT|275&GDT||Ann Arbor Medical Center\.br\Echocardiography Laboratory\.br\Telephone: (734)-555-1234 Fax: (734)-555-1235\.br\\.br\ECHO REPORT\.br\Patient Name: ALEX WILLIAM SUMNER Patient ID: M555\.br\Exam Date: March 5, 2003 Patient DOB: February 12, 1968\.br\Date of Report: March 5, 2003 Height: \.br\Referring Phys. YEVES ANDREW. TIESSEN Weight: \.br\Referring Diag. Acute MI unspecified site, initial episode of care-410.91 \.br\Resting BP: / \.br\Indication: Kinet, Acute MI anterolateral, subsequent episode of care-410.02\.br\\.br\M-mode Data\.br\LVDD: AO: \.br\LVSD: EPSS: \.br\Fract. Shortn: PW: \.br\RVDD: EDV Teichholz: \.br\IVSTD: ESV Teichholz: \.br\IVSTS: SV: \.br\Fract. Change: EF: \.br\LAD: \.br\\.br\2D Study\.br\There is mild left atrial enlargement. \.br\There is apical akinesis with wall thinning compatible with scar. The\.br\distribution suggests a distal left anterior descending coronary artery\.br\distribution. \.br\\.br\\.br\\.br\Doppler\.br\There is trivial aortic regurgitation present. \.br\\.br\\.br\\.br\\.br_____\.br\Marcus T Welby\.br\\.br\||||||F

**Corrected Report**

MSH|^~\&|KinetDx|Ann Arbor Medical Center|Broker|Connectivity Lab|20030305105716||ORU^R01|00002455|P|2.2||||||ISo_IR 100

PID|||M555||SUMNER^ALEX^WILLIAM||19680212|M|

OBR|1||275|^Adult Heart|||20030305120744|||||||||||||20030305162300|||C||||||

|Welby^Marcus^T

OBX|1|CE|275&IMP||^Acute MI unspecified site, initial episode of care-410.91||||||C

OBX|2|FT|275&GDT||Ann Arbor Medical Center\.br\Echocardiography Laboratory\.br\Telephone: (734)-555-1234 Fax: (734)-555-1235\.br\\.br\ECHO REPORT\.br\Patient Name: ALEX WILLIAM SUMNER Patient ID: M555\.br\Exam Date: March 5, 2003 Patient DOB: February 12, 1968\.br\Date of Report: March 5, 2003 Height: \.br\Referring Phys. YEVES ANDREW. TIESSEN Weight: \.br\Referring Diag. Acute MI unspecified site, initial episode of care-410.91 \.br\Resting BP: / \.br\Indication: Kinet, Acute MI anterolateral, subsequent episode of care-410.02\.br\\.br\M-mode Data\.br\LVDD: AO: \.br\LVSD: EPSS: \.br\Fract. Shortn: PW: \.br\RVDD: EDV Teichholz: \.br\IVSTD: ESV Teichholz: \.br\IVSTS: SV: \.br\Fract. Change: EF: \.br\LAD: \.br\\.br\2D Study\.br\There is mild left atrial enlargement. \.br\There is apical akinesis with wall thinning compatible with scar. The\.br\distribution suggests a distal left anterior descending coronary artery\.br\distribution. \.br\\.br\\.br\\.br\Doppler\.br\There is trivial aortic regurgitation present. \.br\\.br\\.br\\.br\\.br_____\.br\Marcus T Welby\.br\\.br\||||||C

OBX|3|FT|275&ADT||April 23, 2003 TIESSEN, YEVES\.br\Further examination of this study indicates the possibility for some\.br\additional aortic regurgitation\.br\||||||C

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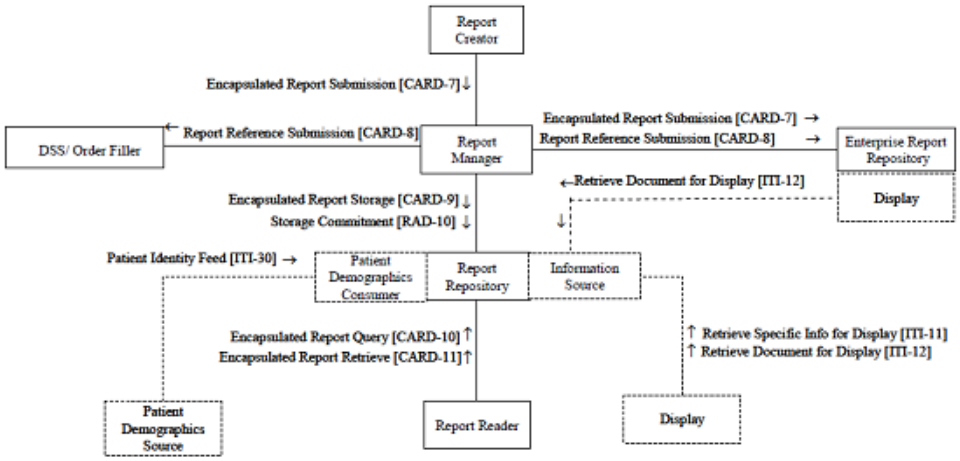
# 10 IHE DRPT Report Creator

The Displayable Reports Profile specifies transactions supporting the creation, revision, intra/inter-department transmission, and reading of display-ready clinical reports. In the imaging procedure context, it provides linkage between the report, the imaging and other evidence of the procedure. The report is provided to users outside the department for broad distribution (e.g., using other profiles).

The DRPT Profile requires the use of the Portable Document Format (PDF), which has emerged as a means of encoding documents ready for presentation, including graphical content. For reporting on imaging procedures, especially on cardiac procedures, PDF is able to present the full range of documentation generated by a wide variety of reporting packages. Furthermore, PDF allows the reporting physician to control the "look" of the report, which is important for both clinical and business reasons.

*syngo* Dynamics is a Report Creator – A system that generates and transmits clinical reports.




Complete details of the IHE DRPT implementation requirements can be found at: http://www.ihe.net/Technical_Framework/index.cfm#cardiology.

## 10.1 IHE DRPT Message Examples

Below is a sequence sample of a test study from preliminary to final to amended in *syngo* Dynamics and the corresponding MDM T2 and MDM T10 messages.

MSH|^~\&|*syngo* Dynamics|Hospital Name|Receiving Application|Receiving Facility|201011151311||MDM^T02|6|P|2.3.1||||||8859/1
EVN||201011151311 PID|||drpt2||sample^drpt^^^mr OBR|1|^*syngo* Dynamics||^Adult Cardiac|||20101115131051||||||||||||||||||R
TXA|1001|DI|AP||||20101115131124.431|||||1.3.12.2.1107.5.8.11.105.17776024256.374677893148344|||||PA
OBX|1|HD|^113014^DICOMStudy^DCM||1.3.12.2.1107.5.8.11.105.17776024256.374677874100265||||||O
OBX|2|ED|^Physician||^Application^PDF^Base64^JVBERi0xLjENCg0KMyAwIG9iag0CAgICAgICAgICA0YNCg==||||||R

MSH|^~\&|*syngo* Dynamics|Hospital Name|Receiving Application|Receiving Facility|201011151311||MDM^T10|9|P|2.3.1||||||8859/1
EVN||201011151311 PID|||drpt2||sample^drpt^^^mr OBR|1|^*syngo* Dynamics||^Adult Cardiac|||20101115131051||||||||||||||||||F
TXA|1002|DI|AP||||20101115131147.228||||^dehar^todd|1.3.12.2.1107.5.8.11.105.17776024256.374677909041117|1.3.12.2.1107.5.8.11.105.17776024256.374677893148344||||AU|||||^dehar^todd^^^^^^^^^^^^20101115131147.228
OBX|1|HD|^113014^DICOMStudy^DCM||1.3.12.2.1107.5.8.11.105.17776024256.374677874100265||||||O
OBX|2|ED|^Physician||^Application^PDF^Base64^JVBERi0xLjENCg0KMyAwIG9iaCg==||||||F

MSH|^~\&|*syngo* Dynamics|Hospital Name|Receiving Application|Receiving Facility|201011151312||MDM^T10|12|P|2.3.1||||||8859/1
EVN||201011151312 PID|||drpt2||sample^drpt^^^mr OBR|1|^*syngo* Dynamics||^Adult Cardiac|||20101115131051||||||||||||||||||C
TXA|1003|DI|AP||||20101115131147.228||||^dehar^todd|1.3.12.2.1107.5.8.11.105.17776024256.374677944757801|1.3.12.2.1107.5.8.11.105.17776024256.374677909041117||||AU|||||^dehar^todd^^^^^^^^^^^^20101115131147.228
OBX|1|HD|^113014^DICOMStudy^DCM||1.3.12.2.1107.5.8.11.105.17776024256.374677874100265||||||O
OBX|2|ED|^Physician||^Application^PDF^Base64^JVBERi0xLjENCg0KMTEgMCBvYmoQo=||||||C

# 11 Detailed Financial Transaction (DFT) Messages

As a patient is treated, the clinical data is transferred to the appropriate departments throughout the hospital, including billing. The main HL7 messages transferred to billing are as follows:

- ADT - Message containing patient demographics
- DFT - Message containing detailed financial transactions
- ORU - Message containing unsolicited observation result

Every healthcare environment bills for services provided. The goal of billing is to increase reimbursement in a timely fashion. Automating clinical data delivery through HL7 interfaces provides accurate information quickly to the billing department. Delivery of billing information needs to happen periodically – most often on a daily basis – and can be accomplished through an off-hours batch method. This is done using the DFT message.

The DFT message describes a financial transaction that is sent to a billing system and is used for patient accounting purposes. This message is used to send charges from *syngo* Dynamics to a Hospital Information System (HIS) or a Radiology Information System (RIS). This message may include ancillary charges or patient deposits, and is sent between the DSS/Order Filler and the Charge Processor. The DSS/Order Filler then verifies whether the procedure is complete. Credit, void, or other adjustment transactions are not supported.

The segments and groups of segments in a DFT-P03 message include the following:

| Segment/ Group | Name | Optional/Repeatable | Remarks |
|---|---|---|---|
| MSH | Message header | Required | NA |
| EVN | Event type | Required | NA |
| PID | Patient identification | Required | NA |
| PID1 | Patient demographics | Optional | NA |
| PV1 | Patient visit | Optional | NA |
| PV2 | Patient visit – additional information | Optional | NA |

| Segment/ Group | Name | Optional/Repeatable | Remarks |
|---|---|---|---|
| DB1 | Disability segment | Optional, Repeatable | NA |
| OBX | Observation | Optional, Repeatable | NA |
| FT1 | Financial Transaction | Required | Transaction group |
| PR1 | Procedures | Required | Procedure group, part of Transaction group |
| ROL | Role | Optional, Repeatable | Procedure group, part of Transaction group |
| IN1 | Insurance | Repeatable | Insurance group |
| IN2 | Insurance additional info | Optional | Insurance group |
| IN3 | Insurance additional info – certification | Optional | Insurance group |
| DG1 | Diagnosis | Optional, Repeatable | Additional segment, not part of a group |
| DRG | Diagnosis Related Group | Optional | Additional segment, not part of a group |
| GT1 | Guarantor | Optional, Repeatable | Additional segment, not part of a group |
| ACC | Accident | Optional | Additional segment, not part of a group |

The key segments containing data are as follows:

- PID: Patient Information
- PV1: Visit Information (DOS)
- FT1: Financial Transaction
- IN1: Insurance Information
- IN2: Additional Insurance Information
- IN3: Additional Insurance Info, Certification
- GT1: Guarantor
- AUT: Authorization Information

**Message Processing**

*syngo* Dynamics generates a charge file for every verified report in each department that has the billing option enabled. The files are created once a day, typically at day-end, and are sent to the billing upload folder for retrieval by the OPENLink DFT interface instance on *syngo* Dynamics or Magic Link A. The OPENLink interface then parses the charge files and converts them into HL7 DFT transactions. The DFT transactions are transmitted outbound by OPENLink via a TCP/IP socket connection using HL7 Minimal Lower Level Protocol (MLLP) transaction framing. Once the DFT transactions are submitted to the destination system, the source charge files are deleted.

**Example: DFT Message**

The following message shows the addition of a test, Lipid Panel, to a patient's bill.

MSH|^~\&|FrapLab|StJohn|HIS|StJohn|20071217094822||DFT^P03|MSGIDv|P|2.3

PID||3|82828||Simpson^Margaret^^^Mrs.||19650525|F|||12 Maple St.^^Springfield^OH^21003^USA

PV1|4||^22^1||||2360^England^Mikey|||IP|||||||||4|||||||||||||||||||||||||20071217094755|20071217094813

FT1|1|6|4|20071217094821||Credit|303756^Lipid Panel^L|||2|115

The following message shows a single FT1 segment.

MSH|^~\&|SYNGODYNAMICS|Hospital Name|||201506172300||DFT^P03|15289507743831|P|2.4
EVN|P03|20150617230008

PID|1||124789||SAMPLE^TESTING||19541215|F|||||||||78451239
OBR|1||8574963||||20150617162026
FT1|1|8574963||20150617||CG|456|||1|||||||||123^EXPORT^DOC||||99307^Echocardiography, transthoracic

The following message shows multiple FT1 segments.

MSH|^~\&|SYNGODYNAMICS|Hospital Name|||201506182300||DFT^P03|15289519973811|P|2.4
EVN|P03|20150618230047

PID|1||2424||TEST3^TESTING||19750909|M|||||||||654654
OBR|1||5467||||20150618104603
FT1|1|5467||20150618||CG|456|||1|||||||||123^EXPORT^DOC|44^REQUESTING^DOC||||93306^Echocardiography, transthoracic real time image
FT1|2|5467||20150618||CG|456|||1|||||||||123^EXPORT^DOC|44^REQUESTING^DOC||||99307^Echocardiography, transthoracic
FT1|3|5467||20150618||CG|456|||1|||||||||123^EXPORT^DOC|44^REQUESTING^DOC||||92982^Percutaneous transluminal coronary angioplasty (PTCA), single vessel

## 11.1 Default Segment Listing

The tables listed below describe the required and optional HL7 data elements, the corresponding *syngo* Dynamics database fields, and the default values used by this interface. Elements that have an "N" in the "OPT HL7/*syngo* Dynamics" column are not supported in this interface by *syngo* Dynamics.

### 11.1.1 MSH Segment

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 1 | 1 | ST | R | Field Separator | \| |
| 2 | 4 | ST | R | Encoding Characters | ^~\& |
| 3 | 180 | HD | O | Sending Application | Default: SYNGODYNAMICS |
| 4 | 180 | HD | O | Sending Facility | [Hospital Name] |
| 5 | 180 | HD | O | Receiving Application | User defined |
| 6 | 180 | HD | O | Receiving Facility | User defined |
| 7 | 26 | TS | R | Date/Time of Message | Date/Time of Message |
| 8 | 40 | ST | O | Security | NA |
| 9 | 13 | CM | R | Message Type | DFT^P03 |

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 10 | 20 | ST | R | Message Control ID | Unique ID |
| 11 | 3 | PT | R | Processing ID | P (configurable) |
| 12 | 60 | VID | R | Version ID | HL7 Version (2.4) |

### 11.1.2 EVN Segment

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 1 | 3 | ID | B | Event Type Code | P03 |
| 2 | 26 | TS | R | Recorded Date/Time | Date/Time of Message |

### 11.1.3 PID Segment

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 1 | 4 | SI | O | Set ID | 1 |
| 2 | 20 | CX | B | Patient ID | NA |
| 3 | 250 | CX | R | Patient ID List | Patient ID only |
| 4 | 20 | CX | B | Alternate Patient ID | NA |
| 5 | 250 | XPN | R | Patient Name | Patient Name |
| 6 | 250 | XPN | O/N | Mother's Maiden Name | NA |
| 7 | 26 | TS | O | Date/Time of Birth | Date of Birth |
| 8 | 1 | IS | O | Administrative Sex | M, F, or O |
| 9 | 250 | XPN | O/N | Patient Alias | NA |
| 10 | 250 | CE | O/N | Race | NA |
| 11 | 250 | XAD | O/N | Patient Address | NA |

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 12 | 4 | IS | O/N | Country Code | NA |
| 13 | 250 | XTN | O/N | Phone – Home | NA |
| 14 | 250 | XTN | O/N | Phone – Business | NA |
| 15 | 250 | CE | O/N | Primary Language | NA |
| 16 | 250 | CE | O/N | Marital Status | NA |
| 17 | 250 | CE | O/N | Religion | NA |
| 18 | 250 | CX | O/R | Patient Account Number | Admission ID (Can also be sent in PV1-19) |

### 11.1.4 PV1 Segment (Optional)*

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 1 | 4 | SI | O | Set ID | 1 |
| 2 | 1 | IS | R/O | Patient Class | Default “U” |
| 3 | 80 | PL | O | Patient Location | NA |
| 4 | 2 | IS | O/N | Admission Type | NA |
| 5 | 250 | CX | O/N | Preadmit Number | NA |
| 6 | 80 | PL | O/N | Prior Patient Location | NA |
| 7 | 250 | XCN | O/N | Attending Doctor | NA |
| 8 | 250 | XCN | O | Referring Doctor | Referring Physician |
| 9 | 250 | XCN | O/N | Consulting Doctor | NA |
| 10 | 3 | IS | O/N | Hospital Service | NA |
| 11 | 80 | PL | O/N | Temporary Location | NA |
| 12 | 2 | IS | O/N | Preadmit Test Indictor | NA |
| 13 | 2 | IS | O/N | Re-admission Indicator | NA |
| 14 | 6 | IS | O/N | Admit Source | NA |

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 15 | 2 | IS | O/N | Ambulatory Status | NA |
| 16 | 2 | IS | O/N | VIP Indicator | NA |
| 17 | 250 | XCN | O/N | Admitting Doctor | NA |
| 18 | 2 | IS | O/N | Patient Type | NA |
| 19 | 250 | CX | O | Visit Number | Admission ID (Can also be sent in PID-18) |

* This segment is not enabled by default.

### 11.1.5 OBR Segment (Optional)

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 1 | 4 | SI | O | Set ID | 1 |
| 2 | 22 | EI | C/O | Placer Order Number | NA |
| 3 | 22 | EI | C/O | Filler Order Number | NA |
| 4 | 250 | CE | R/O | Universal Service ID | External charge code linked to *syngo* Dynamics study type |
| 5 | 2 | ID | B/N | Priority | NA |
| 6 | 26 | TS | B/N | Requested Date/Time | NA |
| 7 | 16 | TS | C/O | Observation Date/Time | Study Date/Time |
| 8 | 26 | TS | O/N | Observation End Date/Time | NA |
| 9 | 20 | CQ | O/N | Collection Volume | NA |
| 10 | 250 | XCN | O/N | Collector Identifier | NA |
| 11 | 1 | ID | O/N | Specimen Action Code | NA |
| 12 | 250 | CE | O/N | Danger Code | NA |
| 13 | 300 | ST | O/N | Relevant Clinical Info | NA |
| 14 | 26 | TS | C/N | Specimen Received Date/Time | NA |
| 15 | 300 | CM | O/N | Specimen Source | NA |
| 16 | 250 | XCN | O | Ordering Provider | Requesting physician |

### 11.1.6 FT1 Segment

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 1 | 4 | SI | O | Set ID | FT1 segment sequence number |
| 2 | 12 | ST | O | Transaction ID | Transaction ID |

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 3 | 10 | ST | O/N | Transaction Batch ID | NA |
| 4 | 26 | TS | R | Transaction Date | NA |
| 5 | 26 | TS | O | Transaction Posting Date | NA |
| 6 | 8 | IS | R | Transaction Type | CG (Charge); credits and other adjustments not supported |
| 7 | 250 | CE | R | Transaction Code | External charge code linked to *syngo* Dynamics Study Type (e.g. Universal Service ID) |
| 8 | 40 | ST | B | Transaction Description | NA |
| 9 | 40 | ST | B/N | Transactions Description – Alternate | NA |
| 10 | 6 | NM | O | Transaction Quantity | Default "1" |
| 11 | 12 | CP | O/N | Transaction Amount – Extended | NA |
| 12 | 12 | CP | O/N | Transaction Amount – Unit | NA |
| 13 | 250 | CE | O/N | Department Code | NA |
| 14 | 250 | CE | O/N | Insurance Plan ID | NA |
| 15 | 12 | CP | O/N | Insurance Amount | NA |
| 16 | 80 | PL | O/N | Assigned Patient Location | NA |
| 17 | 1 | IS | O/N | Fee Schedule | NA |
| 18 | 2 | IS | O/N | Patient Type | NA |
| 19 | 250 | CE | O | Diagnosis Code | From *syngo* Dynamics Diagnosis library |
| 20 | 250 | XCN | O | Performed By Code | Billing ID & name of physician reading study |
| 21 | 250 | XCN | O | Ordered By Code | Requesting physician |
| 22 | 12 | CP | O/N | Unit Cost | NA |
| 23 | 22 | EI | O | Filler Order Number | NA |
| 24 | 250 | XCN | O | Entered By Code | NA |

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 25 | 250 | CE | O | Procedure Code | From *syngo* Dynamics Procedure library |
| 26 | 250 | CE | O | Procedure Code Modifier | NA |

### 11.1.7 PR1 Segment (Optional)*

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 1 | 4 | SI | R | Set ID | PR1 segment sequence number |
| 2 | 3 | IS | B | Procedure Coding Method | NA |
| 3 | 250 | CE | R | Procedure Code | From *syngo* Dynamics Procedure library |
| 4 | 40 | ST | B | Procedure Description | NA |
| 5 | 26 | TS | R | Procedure Date/Time | Report verification date/time |
| 6 | 2 | IS | O/N | Procedure Functional Type | NA |
| 7 | 4 | NM | O/N | Procedure Minutes | NA |
| 8 | 250 | XCN | B/N | Anesthesiologist | NA |
| 9 | 2 | IS | O/N | Anesthesia Code | NA |
| 10 | 4 | NM | O/N | Anesthesia Minutes | NA |
| 11 | 250 | XCN | B/N | Surgeon | NA |
| 12 | 250 | XCN | B | Procedure Practitioner | NA |
| 13 | 250 | CE | O/N | Consent Code | NA |
| 14 | 2 | ID | O/N | Procedure Priority | NA |
| 15 | 250 | CE | O | Associated Diagnosis Code | NA |
| 16 | 250 | CE | O | Procedure Code Modifier | NA |
| 17 | 20 | IS | O/N | Procedure DRG Type | NA |
| 18 | 250 | CE | O/N | Tissue Type Code | NA |
| 19 | 427 | EI | C | Procedure Identifier | NA |

| Seq | Len | DT | OPT HL7/ *syngo* Dynamics | Element Name | DB Field in *syngo* Dynamics/ Comments |
|---|---|---|---|---|---|
| 20 | 1 | ID | C | Procedure Action Code | NA |

* This segment is not enabled by default.

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# 12 *syngo* Dynamics Reporting

## 12.1 Allergy Information

Allergy information is communicated in the optional Allergy segment, AL1.

The AL1 segment contains information on a single allergy and is repeated for each allergy that is recorded for the patient. Within the AL1 segment, the allergy type and allergy description may be repeated, as required. While the AL1 segment can appear in ADT^A01 (Admit), ADT^A31 (Update Person), RDE (Pharmacy Encoded Order - Perfected), and ORM (Pharmacy Prescription Order - non-perfected), allergy information is imported only from ORM messages.

AL1 segment contains the allergy type and allergy description. Refer to “Message Segment: AL1” on page 69 for detailed information.

Allergy information from HL7 ADT and ORM messages, imported into study data, are displayed on the *syngo* Dynamics worksheet and report. Allergy information is imported into a study when the order is associated with the study. The allergy information is purged when the order association is broken.

The variables that contain the allergy information are as follows:

- Sensis: ALLER2 Group (ALLER2)

  The allergy information is assigned to Sensis from the Study context and not from data contexts.

- Philips: PATN ALLERGIES (in 3rd Party Hemo) – C-priority, not for Phase Zero

## 12.2 Read-only PHI Fields

In the *syngo* Dynamics worksheet, Protected Health Information (PHI) data fields updated through HL7 orders in Electronic Health Record System (EHR) appear as read-only. This means that users cannot modify data for certain PHI fields that are present in *syngo* Dynamics worksheet and marked as EHR studies in the *syngo* Dynamics database.

Refer to the following PHI fields that are marked as read-only in the *syngo* Dynamics worksheet. If you do not want a certain field to appear read-only in the worksheet, remove the field from the EHRReadOnlyFields.txt file available on the *syngo* Dynamics server in <Server>\F:\Acuson\Configuration.

- PatientID
- PatientsName

- PatientsBirthDate
- OtherPatientIDs
- AccessionNumber
- PatientSex
- PatientsSize
- PatientsWeight
- ReferringPhysiciansName
- MasterPatientID
- PatientsAddress1
- PatientsAddress2
- PatientsCity
- PatientsCountry
- PatientsOfficePhoneNumber
- PatientsEMailAddress
- PatientsHomePhoneNumber
- PatientsAddressState
- PatientsZipCode
- PatientsMobilePhoneNumber
- NameIDConflictExists - (The **Resolve Patient/ID Conflict** button will be in disabled state.)
- CurrentPatientLocation
- MultiMRNSiteName

## 12.3 Order Messages (ORM) Mapping

When *syngo* Dynamics is integrated with an Electronic Health Record System (EHR), the following information is extracted from the inbound HL7 ORM messages: Patient demographics, Visit details, Allergy details. The details are mapped in the *syngo* Dynamics database and the values pertaining to these are updated in the *syngo* Dynamics worksheet and report.

This information is required to complete pre-procedural documentation and reporting. For more information on pre-procedural information, refer to "Pre-procedural Documentation" on page 29.

Prerequisites to ensure that the mapping works are given as follows:

- HL7 interface (ADT/ORM) is enabled in the **Server Configuration Tool**.
- ORM matching rule (Filler Order Number vs Study Accession Number) is configured in SysAdmin.
- Site ID & Patient ID is configured in the ADT matching rules in SysAdmin.
- Fields mentioned in the table below are configured in the report and worksheet template.

The following table contains details about the HL7 field information and the corresponding *syngo* Dynamics database field name and the *syngo* Dynamics table containing the field. These HL7 fields are predefined in **HL7SegmentMapping.xml** present on the server at **F:\Acuson\Configuration\HL7Cache** .

| HL7 Field | *syngo* Dynamics Database Field (Reporting Model) | Context Name | Report/Worksheet |
|---|---|---|---|
| PID 3.1 ID | PATIENT_ID | STUDY | Pt. ID |
| PID -3.4 Assigning Authority | SiteID/MultiMRNSiteID | STUDY | Site ID |
| PID -5 Patient Name | PATIENT_NAME | STUDY | Pt. Name |
| PID -7 Date of Birth | PATIENT_BIRTH_DATE | STUDY | Pt. Birth Date |
| PID-8 Sex | PATIENT_SEX | STUDY | Pt. Sex |
| PID 18.1 Patient Account Number | Department_Visit_Number | Study | AdmissionId |
| ORC-1 Order Control | Used For Processing* | NA | NA |
| ORC-2 Placer Order Number | PlacerOrderNumberImagingServiceRequestLO | STUDY | Placer Order Number |

| HL7 Field | *syngo* Dynamics Database Field (Reporting Model) | Context Name | Report/Worksheet |
|---|---|---|---|
| ORC-3 Filler Order Number | ACCESSION_NUMBER | STUDY | Accession Number |
| ORC-5 Order Status | Used For Processing* | NA | NA |
| ORC-12 Ordering Provider | OrderingProviderName | STUDY | Ordering Provider Name |
| OBR-2 Placer Order Number | PlacerOrderNumberImagingServiceRequestLO | STUDY | Placer Order Number |
| OBR-3 Filler Order Number | ACCESSION_NUMBER | STUDY | Accession Number |
| OBR-4 Universal Service Identifier | UniversalServiceId | STUDY | Universal Service Identifier |
| OBR-5 Priority | Used For Processing* | NA | NA |
| OBR-7 Observation Date/Time | Study Date/Time(for pre-procedure) | STUDY | Study Date / Study Time |
| OBR-16 Ordering Provider | OrderingProviderName | STUDY | Ordering Provider Name |
| OBR-20 Filler Field 1 | ACCESSION_NUMBER,<br>Used for Processing*(HNA_ACCN) | STUDY,<br>STUDY | Accession Number |
| OBR-31.2 Reason For Study | Indications | STUDY | Indications |
| PV1-1.2 Patient Class | PatientClass | STUDY | Patient Class |
| PV1-1.8 Referring Doctor | REFERRING_PHYSICIAN | STUDY | Referring Physician |
| MRG-1.1 ID | Used For Processing* | NA | NA |
| MRG-1.4 Assigning Authority | Used For Processing* | NA | NA |
| AL1-2 Allergy Type | Allergy_Type_obs | Allergies_ctx | Allergy Type |
| AL1-3 Allergy Code/Mnemonic/ Description<br>Can be customized to AL1-3.2 | Allergy_Description_txt | Allergies_ctx | Allergy Description |
| AL1-4 Allergy Severity | Allergy_Severity_obs | Allergies_ctx | Allergy Severity |
| AL1-5 Allergy Reaction | Allergy_Reaction_txt | Allergies_ctx | Allergy Reaction |

| HL7 Field | *syngo* Dynamics Database Field (Reporting Model) | Context Name | Report/Worksheet |
|---|---|---|---|
| AL1-6 Identification Date | Allergy_Identification_Date_dt | Allergies_ctx | Allergy Identification Date |

* Values are not stored in the database. The values are used for processing the inbound HL7 message.

System administrators can also configure additional HL7 fields required for processing HL7 ORM messages. For more information on how to configure additional HL7 fields, refer to the *syngo* Dynamics System Administration Manual.

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# 13 Message Segments

The list specifies the information at each field level. The Fields are categorized into Field, Field Name, Type and Notes. In the Field Type "M" means Mandatory & "O" means optional. All of the "Not Supported Fields" and "save and forward option available" in the below tables are intended to be supported in future versions and currently they are supported as save and forward option only. The save and forward option in the ORM will store all mandatory fields for MWL providers. Currently, the EVN Segment is optional.

All of the "Non Supported Fields" can be configured to be supported by configuring them as additional HL7 fields. For more information on configuring additional HL7 fields, refer to *syngo* Dynamics System Administration Manual specific to the application version installed at your hospital.

## 13.1 Message Segment: MSH

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| MSH 1 | Separator | NA | \| |
| MSH 2 | Encoding Characters | NA | ^~\& Supported Currently |
| MSH 3 | Sending Application | O | NA |
| MSH 4 | Sending Facility | M | The MSH4 is Sending Facility (Configuration) becomes MSH6 Receiving Facility as per Inbound. For outbound ORM it will be vice versa. |
| MSH 5 | Receiving Application | O | Configurable |
| MSH 6 | Receiving Facility | O | NA |
| MSH 7 | Date and Time of Message | O | NA |
| MSH 8 | Security | O | NA |
| MSH 9.1<br>MSH 9.2 | Message Type<br>Trigger Event | M | E.g., ADT  A01 |

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| MSH 10 | Message Control ID | O | Order ID is used as Message control ID in Outbound ORMs |
| MSH 11 | Processing ID | O | No Validation |
| MSH 12 | Version ID | M | 2.3.1 version only supported. Any other formats will have to convert to the required format via standard interface engines. |

## 13.2 Message Segment: EVN

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| EVN 1 | Event type Code | O | NA |
| EVN 2 | Recorded Date and Time | O | Date and Time of the Event |

## 13.3 Message Segment: PID

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| PID 2 | Patient ID | O | Save and Forward Only. |
| PID 3.1 | Patient Identifier | M | Patient ID –Unique ID assigned by the HIS. If multiple PIDS (MRNs) are supported, they are separated by commas. Values Currently Accepted are MRN and MPI.(EMPI or EE SS Needs to mapped to either MR or MPI Only) |
| PID 3.4 | Assigning Authority | M | PID assigner if Type MR. For MPI it can be optional or blank. Note: - If this value is blank for MR TYPE then NACKS is sent to IE. |
| PID 3.5 | Identifier Type | M | MR or MPI .The type needs to be configured under Tab Patient ID mapping in data porting tool Siemens.Cvis.Utilities.DataPorting which will be located in the server path :- C:\Program Files\Siemens\Cvis\bin |
| PID 4.1 | Alternate Patient ID | O | Save and Forward Option available |

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| PID 5 .1 | Family +Last Name | O | Anyone Name (PID 5.1 or 5.2) Should be available else the message is Error Logged. For PV1-2(Patient Class:E) The first name or last name is not mandatory |
| PID 5.2 | Given Name | O | Anyone Name(PID 5.1 or 5.2) Should be available else the message is error logged |
| PID 5.3 | Middle Name | O | Save and Forward Option available |
| PID 5.4 | Suffix | O | Save and Forward Option available |
| PID 5.5 | Prefix | O | Save and Forward Option available |
| PID 6 | Mother's Maiden Name | O | Save and Forward Option available |
| PID 7.1 | Date of Birth | O | Not mandatory field. If PID 7.1 is null, default value 1900/01/01) will be the DOB of the patient (YYMMMMDD) |
| PID 8 | Gender | O | If no value is sent, the gender is updated as unknown. Supported are M,F,U and B .B is not recognized as standard HL7 defined Gender and it will updated as "Unknown "or "ambiguous" in UI |
| PID 9.1 | Alias Last Name | O | UI will display the entire alias name in a single field separated by Comma.(ln,mn,fn) |
| PID 9.2 | Alias Given Name | O | UI will display the entire alias name in a single field separated by Comma. |
| PID 9.3 | Alias Middle Name | O | UI will display the entire alias name in a single field separated by Comma. |
| PID 10.1 | Race | O | All Supported DDI Should be Part of the Configuration .Users is Advised to create the Same Abbreviation as used in the IE. Also there is an option to edit the Factory Default Abbreviation |
| PID 11.1 to 6 | Patient Address | O | Street Address, Other Designation, City, State, ZIP and Country are Supported Each Value needs to separated by ^ and "&" needs to be replace by \T\(Escape ) |
| PID 13.1 | Home Tel No | O | Save and Forward Option Available |
| PID 14.1 | Business Tel no | O | Save and Forward Option Available |

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| PID 13.5,6,7 | Telephone No -HOME | O | Supports up to 20 Char. Checks first this field and then 13.1 |
| PID 14.5,6,7 | Telephone No -Office | O | Supports up to 20 Char<br>Checks first this field and then 14.1 |
| PID 15.1 | Language | O | All Supported DDI Should be Part of the Configuration .Users are advised to create the Same Abbreviation as used in the IE. Additionally users are allowed to edit DDI abbreviation. |
| PID 16.1 | Marital status | O | All Supported DDI Should be Part of the Configuration .Users are Advised to create the Same Abbreviation as used in the IE<br>Also there is an option to edit the Factory Default Abbreviation |
| PID 17.1 | Religion | O | All Supported DDI Should be Part of the Configuration .Users are Advised to create the Same Abbreviation as used in the IE<br>Also there is an option to edit the Factory Default Abbreviation |
| PID 18.1 | Account Number | O | Unique Account Number |
| PID 19 | SSN Number | O | Alternate ID Supported |
| PID 20 | Driving License | O | Alternate ID Supported |
| PID 21 | Mothers Identifier | O | Supported as Save and Forward Option. |
| PID 22 | Ethnic Group | O | All Supported DDI Should be Part of the Configuration .Users are Advised to create the Same Abbreviation as used in the IE. Also there is an option to edit the Factory Default Abbreviation |
| PID 23 | Birth Place | O | Save and Forward Option available |
| PID 24 | Multiple Birth Indicator | O | Save and Forward Option available |
| PID 25 | Birth Order | O | Save and Forward Option available |
| PID 26 | Citizenship | O | Save and Forward Option available |
| PID 27 | Veterans Military Status | O | Save and Forward Option available |

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| PID 28 | Nationality | O | Save and Forward Option available |
| PID 29 | Patient Death Date and Time | O | Save and Forward Option available |
| PID 30 | Patient Death Indicator | O | Save and Forward Option available |

## 13.4 Message Segment: PV1

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| PV1-2 | Patient Class | M | Only I, O, P and E Classes are Supported. Other Classes are also honored and treated as a separate class "Other". All outbound ORMs will be sent with the same class as received. |
| PV1-3.1,3.2,3.3 | Assigned Patient Location | O | POC, Room and Bed Format Supported<br>3.1 and 3.2 are both mandatory fields required to process anyvalue in PV1-3 segment |
| PV1-4 | Admission Type | O | Expects the Patient Class only and not the type .Save and Forward Option Available |
| PV1 -5 | Pre-admit No | O | Save and Forward Option Available |
| PV1-6.1,6.2,6.3 | Prior Patient Location | O | POC, Room and Bed Supported –Will be replaced by PV1-3.1 for A02 message |
| PV1-7 | Attending Doctor | O | Save and forward option available |
| PV1-8 | Referring Doctor | O | Tool available to import physicians. Performing and admitting doctors should be part of referring doctors import list. |
| PV1 -9 | Consulting Doctor | O | Save and Forward Option Available |
| PV1-10 | Hospital Service | O | Departments Like Cardiology, EP, Cath. |
| PV1-14 | Admit Source | O | Save and Forward Option Available |
| PV1-15.1 | Ambulatory Status | O | All Supported DDI Should be Part of the Configuration .Users are Advised to create the Same Abbreviation as used in the IE |
| PV1-16 | VIP Indicator | O | Y (1),N (0) Supported |

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| PV1-17.1,17.2 | Admitting Doctor | O | Supported |
| PV1-18 | Patient Type | O | Save and Forward Option Available |
| PV1-19 | Visit Number | M | Unique Visit ID as received by the Placer Application (HIS).<br>19.1 Visit Number retained and the same is sent as outbound.<br>For 19.2 –Default value is 1<br>19.3 –AA Should be same as PID AA or Blank if different the procedure cannot scheduled in WB. |
| PV1-19.4 | Visit Assigning Authority | M | Value is expected to be similar to PID AA and if different, needs to be negotiated. Save and Forward Option Available. |
| PV1-20.1 | Financial Class | O | Save and Forward Option Available |
| PV1 -44 | Admit Date | M | Date of Admission of the Patient Supported. If the Value is absent then Error is Logged |
| PV1-45 | Discharge Date | O | Mandatory only for A03 (Discharge) Message ,else will log error and send positive Ack. |

## 13.5 Message Segment: ORC

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| ORC 1 | Order Control | M | Only RO, NW, CA, RP and DC, SC Supported. Any other Order control needs to converted or mapped to the Above types by the interface engine.<br>RO modifies the order. CA, RP, and DC remove the order and are treated like a "cancel" in *syngo* Dynamics. |

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| ORC 2 | Placer Order Number (PON) | M | The Placer Order Number is referenced by a unique Filling Order Number (FON) Which is directly mapped to the Study UID generated by *syngo* Dynamics. The Same Filler ID is used as PON for Outbound ORMS. Mandatory only for Inbound. |
| ORC 3 | Filler Order ID | M | For Outbound Only.<br>Retain the FON if send by the placer and send as it is in outbound ORM for IMC and Deprecated for GA. If no FON is sent, new FON number is updated. |
| ORC 5 | Order Status | O | Save and Forward Option Available |
| ORC 7 | Quantity and Timing | | Day only is supported in ORC 7.4 and in Outbound ORM the Exact day and time is sent.<br>ORC 7.6 priority Supported as save and forward option available |
| ORC 12 | Order Provider Name | O | Check OBR 16 first and if no value then the Value in ORC 12. |
| ORC 15 | Order Effective Date/Time | O | Contains the date/time that the changes to the request took effect or are supposed to take effect. |
| OBR -1 | Observation Request ID | O | Save and Forward Option Available |
| OBR-2.1 | Placer Order Number | M | Unique Order ID generated by HIS (Placer Application). OBR2 or ORC2 either one is mandatory, not both fields.OBR2 is checked first and then ORC 2.If the Value is absent then error will be logged and send Pos ACK. |
| OBR -3.1 | Filler Order Number | O | Retain id (accession number) sent by HIS/ RIS/inbound. Same value will be sent back IN ORM Outbound. (16 Character Restriction) |

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| OBR -4<br>4.1 – Identifier<br>4.2 –Text<br>4.3 – Name of the Coding System | Universal Service ID | M (Only 4.1) | Procedure types are sent here. Only the procedure types which are mapped to factory defaults via procedure mapping tool will be processed.b If not Pos Ack is sent and error is logged. Any new Procedure created needs to be uploaded via procedure mapping too<br>4.2 = HIS Procedure Code |
| OBR 5 | Priority | O | If no priority is sent then the value is set to elective. No NACKS will be sent |
| OBR 6 | Requested Date and time | O | If no date and time is sent then the value is set to current day and time<br>No NACKS will be sent. Request date should be within next 12 months. |
| OBR 7 | Observation Date and Time | M | If requested time is null, the observation time is taken. No NACKS will be sent |
| OBR 16 | Order Provider Name | O | Check OBR 16 first and if no value then the Value in ORC 12. |
| OBR 18 | Placer Field 1 | O | Custom Field-Not Supported |
| OBR 19 | Placer field 2 | O | Custom Field-Not Supported |
| OBR 27.4 | Start Date and Time | O | Not Supported. Available only for outbound ORM |
| OBR 27.6 | Priority | O | Save and Forward Option Available |
| OBR 44 | Procedure Code | O | Save and Forward Option Available |
| OBR 45 | Procedure Code Modifier | O | Save and Forward Option Available |

## 13.6 Message Segment: MRG

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| MRG 1.1 | Source Patient ID | M | Destination Patient Info is same as PID segment |
| MRG 1.4 | Assigning Authority | M | PID assigning Authority.<br>Mandatory only if the MRG1.5 value is 'MR'. |
| MRG 1.5 | Identifier Code | M | MR or MPI |
| MRG 1.6 | Assigning Facility | O | NA |
| MRG 3 .1 | Prior Patient Account Number | M | Only FOR A41 |
| MRG 5.1 | Prior Patient Visit Number | M | Only for A42 |

## 13.7 Message Segment: DG1

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| DG 1.3.2 | Diagnosis Code Text | O | Only the Description or Text is supported and other attributes of diagnosis are ignored. |
| DG 1.4 | Diagnosis Description | O | Supported |

## 13.8 Message Segment: AL1

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| AL1 3 | Allergy Code ,Mnemonic or Description | O | Currently only Text is supported and other attributes are ignored |

One AL1 segment is sent for each separate patient allergy. Therefore a series of (none, 1 or more) AL1 segment(s) may be included in ADT messages, or in pharmacy order (RDE) messages. Refer to the table below for detailed information on the contents of the AL1 segment.

| Sequence | Length | Format | Field Type | Element Name |
|---|---|---|---|---|
| 0 | 3 | | R | Segment ID = "AL1" |
| 1 | 4 | SI | O | Set ID - Internal |
| 2 | 2 | IS | O | Allergy type<br>The values and description are as follows:<br>DA - Drug Allergy<br>FA - Food Allergy<br>MA - Miscellaneous Allergy |
| 3 | 60 | CE | R | Allergy description<br><br>This field consists of several components as follows: <Allergy identifier>^<Text>^<Coding system> |
| 4 | 2 | IS | O | Allergy severity |
| 5 | 15 | ST | O | Allergy reaction |
| 6 | 8 | DT | O | Identification date |

## 13.9 Message Segment: NK1

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| NK 1.1 | ID | O | Supported |
| NK 1.2 | Name | O | Supported |
| NK 1.3 | Relationship | O | Supported |
| NK 1.4 | Address | O | Supported |
| NK 1.5 | Phone No | O | Supported |
| NK 1.6 | Business Phone No | O | Supported |

## 13.10Message Segment: ZDS (Customized Segment)

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| ZDS 1 | Study ID | O | Only for ORM outbound if it is Scheduled |

If the Mandatory Fields are absent in the message then the system sends NACKS or Positive ACKs based on the sanity check. It is advised to configure the interface engine appropriately to receive or to ignore NACKS.

## 13.11Message Segment: ZSU

| Field | Field Name | Field Type | Notes |
|---|---|---|---|
| ZSU 1 | Study instance ID (old) | R | ORM message containing the old study UID for the study that warrants a study UID correction |
| ZSU 1 | Study instance ID (new) | R | ORM message containing the new study UID for the study that warrants a study UID correction |

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# 14 Appendix A: Sample Messages/Generic HL7 Information

## 14.1 ORM-O01 Message

MSH|^~\&|7EDIT|HL7EDIT|SDIS|SIEMENS|20110826160426||ORM^O01|MSGID200205122028|P|2.3.1

PID|||PS4234241^^^CVIS^MR||Donald^Duck^^^Mr.||20110826160411|M|||123 West St.^^MICHIGAN^CO^80020^USA||2498652892|2304972374||||

PV1||O|OP^20A^||||2342^Jones^Bob|||CAR|||||||||239668^^^CVIS|||||||||||||||||||||||20110826160426|

ORC|NW|2010825122028

OBR|1|20110825160426||003038^AdultEcho^L|Elective|20110826160358|20110826160404|||||||||||||||||||

## 14.2 ADT-A01 Message

MSH|^~\&|7edit|1|||20110826110607||ADT^A01|599102|P|2.3.1|||ER|AL|20110825095518|||||

EVN|A01|200708181123|

PID|1||10016604^^^CVIS^MR^1||Dido^Bear^D||19391010|M||1|111 Helm ST^^NoMansland^CA^54321^^P|1|88853451212|8885551212|1|2||4047716^^^7edit^VN^1|123561234|||||||||||N

PV1|1|I||PREOP^101^1^1^^^S|3|||37^Mickey Mouse (AT)^^^^^^7edit^^^^CI|33337^ Mickey Mouse (R)||CAR||||1|||37^ Micky Mouse (ADM))^^^^^^7edit^^^^CI|2|41047334^^^CVIS^VN|4|||||||||||||||||||1||G|||20110826115152|20110826115156|||||

DG1|1|I9|71596^CMP ^I9|CMP ||A|

## 14.3 ADT–A40 Message (Merge Identifier)

MSH|^~\&||Test lab^00D0000000^GUID|
ELR|DOH|20061101102700||ADT^A40|2006280000002|T|2.3.1|

EVN|A40|20061101102700|

PID|||PID0700^5^M11^ADT1^MR^GOOD HEALTH
HOSPITAL|Road^^City^State^DI^^M||^^^^^123^5551212|^^^^^123^5551
213|||||345678901|||U|PV1||N||U|||20090223150551|5101^KELL^DON
^P^^DR|A|PUL||A|R|4|B4~A8|A|A|A|V105-
1^^^ADT1|A|A|A|A|A|||A|A||A|||A||04|A|A|A|H|A|||200008161300|||||TAX|V|
A|

MRG|PID0701^5^M11^ADT1^MR^GOOD HEALTH HOSPITAL

## 14.4 Message with Z Segment

The ZDS segment is used to send the study UID in all of the outbound ORMs. The study UID is required for the Modality Work List.

Inbound Z segments are not supported currently. If any other miscellaneous info needs to be supported, then a mutual understanding is needed.

MSH|^~\&|sDIS|sDIS|||20110906143321||ORM^O01^ORM_O01|ORD000000
0003691|P|2.3.1

PID|||PAT0000000003379^^^^MR||Donald^Duck||190101010012|U

PV1||E|||||||||||||||VIS0000000003390

ORC|RP||sDIS_00000003720^^sDIS_00000003720||SC||^^^201109062130
^^Emergency|||||^^administra|||201109062130

OBR|||sDIS_00000003720^^sDIS_00000003720|Biopsy US^Biopsy
US|Emergency||201109062130|||||||||||||US||||||^^^201109062130^^Emerg
ency

ZDS|1.3.12.2.1107.5.8.11.104110162960070568.634509161808692986

## 14.5 ZSU Segment in ORM Message

When a study UID correction is warranted, the ZSU segment contains the old and the new study UID.

MSH|^~\&|^ASYNC_QUEUEING_SERVICE|||20170728133912.132-
0500||ORM^O01^ZSU_ORM_O01|1|P\S\T|2.6

PID||347823^^^&10.30.20.50.45.23|||APACHETEST^CRAWLER^MIDDLE||19820508000000-0500|F

ZSU|2.16.840.1.113669.632.2.2626886709563223956.7569702317177748753|1.2.840.113970.1.2.840.113970.2280106.20170727.1124721ORC|OP|||||||0170728125959.19-0400

OBR|||00000CV170000169|ECHO TEE 3RD PARTY

## 14.6 ACK Messages

ACK –ACK messages are sent when the message is successfully received. An ACK does not guarantee that a message will be fully processed (e.g. a duplicate ADT^A01 may return an ACK but may not be fully processed).

MSH|^~\&|syngo Dynamics server|||||ACK|T|2.3.1|||||||||

MSA|AA|20180322132200|||||

NACK message is also displayed in ACK message format.

## 14.7 ACK Scenarios Currently Handled

NACK message is also displayed in ACK message format.

| Message | Segment and Field | Message Issue/ Scenario | Expected Behavior | Reason for NACK/ Additional Information |
|---|---|---|---|---|
| General | NA | HL7 Version Number Mismatch | NACK | Sanity Check |
| General | NA | HL7 Format is not proper | NACK | Sanity Check |
| All | PID 3.5 | PID 3 segment does not contain MR or MPI number | NACK | Cannot identify/create the patient |
| All | PID 3 | Patient Identifier(PID 3) is missing | NACK | Cannot identify/create the patient |
| ADT | PV1.19 | Visit Number is missing | NACK | Cannot identify/create the Visit uniquely |

| Message | Segment and Field | Message Issue/ Scenario | Expected Behavior | Reason for NACK/ Additional Information |
|---|---|---|---|---|
| ADT | PV1.44 | Date of Admission is missing | NACK | Not able to create the Visit without the Admission Date |
| ADT | PV1.2 | Visit type is not mentioned or not handled | NACK | I, E, O, P is handled |
| ADT | PID 5 | Both Patient Last name and First name is empty | NACK (Only for Non-Emergence Patient) | For Non emergency Patient, at least one of the names need to be present there. For emergency patient both names are optional |
| ADT | PID 7 | Date of Birth Cannot be in future | NACK | NA |
| ORM (All) | OBR2 | Order Placer Number is missing | NACK | Cannot create/identify order without the ID |
| ORM (All) | OBR 4.2 | Requested Procedure is not supported | ACK | Unknown procedure s cannot be scheduled in WB. If the Procedure is not available in mapping table then positive ACK is sent and the error is logged in the system. |
| ORM (All) | ORC 1 | Requested Order Control is Not supported | NACK | Order Control is not RP, NW, cancel, DL. No business logic for handling other than RP, NW, cancel, DL |
| ORM (All) | OBR 4.2 | Procedure Type is Missing | NACK | Cannot create Procedure without procedure Type |
| Merge - All | PID 3 | Patient ID type is neither MPI nor the MRN | NACK | Not supporting other ID types |
| Merge - A40 | MRG1 | Patient ID type is neither MPI nor the MRN | NACK | Not supporting other ID types |

| Message | Segment and Field | Message Issue/ Scenario | Expected Behavior | Reason for NACK/ Additional Information |
|---|---|---|---|---|
| Merge - A41 | PID 18 | Target patient Account Number is missing | NACK | Not able to identify the account to do the account merge |
| Merge - A41 | MRG 3 | Source Patient Account Number is missing | NACK | Not able to identify the account to do the account merge |
| Merge - A42 | PV1 19 | Target patient Visit Number is missing | NACK | Not able to identify the visit to do the visit merge |
| Merge - A42 | MRG 5 | Source Patient Visit Number is missing | NACK | Not able to identify the visit to do the visit merge |
| ORM | Enable /Disable | Option to Configure Outbound ORM | Y/N | |
| ORM (RP, Cancel) | OBR 2 | Order with the given Placer Number is not found in the system (RP) | ACK, Do not Process; log error | Send ACK & log. Do not process |
| ORM (All) | OBR 6 | Orders can be placed only for 12 months in future | ACK | Send ACK; Do not process; Log error if Order date is beyond 12 months. |
| ADT | PV1.19.4 | Assigning Authority is not provided for the Visit | ACK | AA is expected when type is MRN. SD integration requires AA for creating Study (Under discussion) |
| ADT | PID 7.1 | DOB missing | ACK | Accept & Process even if the DOB is missing |
| A03 | PV1 19 | Visit ID missing | ACK | Accept and Process and log error |

| Message | Segment and Field | Message Issue/ Scenario | Expected Behavior | Reason for NACK/ Additional Information |
|---|---|---|---|---|
| ORM –O01 | NA | Repeat ORMs | ACK | Process and Log Error |

# 15 Appendix B: Configuration Files for ADT/ORM Option

HL7CacheConfiguration.xml and HL7SegmentMapping.xml files are only used for the ADT or ORM reconciliation options. ADT 31 is supported now. These two xml configuration files can be located on the *syngo* Dynamics server at F:\Acuson\Configuration\HL7Cache

The first file HL7CacheConfiguration.xml contains the list of ADT messages we will listen for. To prevent *syngo* Dynamics from receiving one of these message types you must remove its entry from this file and restart the ADT Cache Manager service.

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```

<ADTMessage>ADT^A47</ADTMessage>

</SupportedADTMessages>

<ADTReconciliationRules>

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<ADTReconciliationRule Matches="Site ID,Patient ID,First Initial,Last Name" Enabled="true" />

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<ADTReconciliationRule Matches="Site ID,Patient ID" Enabled="true" />

<ADTReconciliationRule Matches="Patient ID,First Name,Last Name,Date of Birth" Enabled="true" />

<ADTReconciliationRule Matches="First Initial,Last Name,Date of Birth," Enabled="true" />

<ADTReconciliationRule Matches="First Initial,Last Name" Enabled="true" />

<ADTReconciliationRule Matches="Master Patient Index must exist in successful match" Enabled="true" />

</ADTReconciliationRules>

</ADTCacheConfig>

<ORMCacheConfig>

</HL7CacheConfig>

The second file is the HL7SegmentMapping.xml file which contains the mapping info for each item we accept. This file is not intended to be modified. This information is presented for your reference only.

- <HL7MessageMapping xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" Version="1.0" xsi:schemaLocation="syngoDynamics Z:\Server\Implementation\HL7MessageParser\Schemas\MessageDefinition.xsd" xmlns="syngoDynamics">

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