

# **HL7 Conformance Statement**

## **RamSoft RIS/PACS v6**



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## HL7 Conformance Statement

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## 1 OVERVIEW

The RamSoft Mirth Connect (**RMC**) facilitates communication between RamSoft PACS products and external systems (such as a RIS, HIS, or RamSoft Gateway™ to provide Modality Worklists (MWL)).

RMC conforms to the HL7 2.x specification. The following message types are supported.

### 1.1 Inbound Messages

| Event                           | Message type | Event type                                                 |
|---------------------------------|--------------|------------------------------------------------------------|
| Patient Create / Update         | ADT          | A01, A02, A03, A04, A05, A06, A07, A08, A12, A13, A28, A31 |
| Patient Merge                   | ADT          | A30, A34, A35, A39, A40, A44, A47                          |
| Patient Cancel / Delete         | ADT          | A11, A23, A38                                              |
| Order                           | ORM          | O01                                                        |
| Result                          | ORU          | R01                                                        |
| Lab Result                      | ORU          | R01                                                        |
| Scheduling                      | SIU          | S12, S13, S14, S15                                         |
| Billing Account Create / Update | BAR          | P01, P05                                                   |
| Billing Account Cancel          | BAR          | P06                                                        |
| Financial Transaction           | DFT          | P03                                                        |
| User Information                | MFN          | M02                                                        |

### 1.2 Outbound Messages

| Event                           | Message type | Event type         |
|---------------------------------|--------------|--------------------|
| Patient Create / Update         | ADT          | A08                |
| Patient Merge                   | ADT          | A40                |
| Patient Cancel / Delete         | ADT          | A23                |
| Order                           | ORM          | O01                |
| Result                          | ORU          | R01                |
| Billing Account Create / Update | BAR          | P01, P05           |
| Financial Transaction           | DFT          | P03                |
| Vaccination                     | VXU          | V04                |
| User Information                | MFN          | M02                |
| Scheduling                      | SIU          | S12, S14, S15, S17 |

### 1.3 Query Messages

| Event                | Message / Event Type | Response Message / Event Type |
|----------------------|----------------------|-------------------------------|
| Appointments         | SQM^S25              | SQR^S25                       |
| Patient Demographics | QRY^A19              | ADR^A19                       |

## 2 TECHNICAL ENVIRONMENT

| Component          | Details                             |
|--------------------|-------------------------------------|
| Integration Engine | Mirth Connect 4.4.2                 |
| HL7 Version        | 2.3.1                               |
| Transport Protocol | MLLP (Minimal Lower Layer Protocol) |
| Character Encoding | Unicode UTF-8                       |

## 3 COMMUNICATION

RMC communicates via Mirth Channels. Standard Mirth Channels include support for real-time interfaces over TCP/IP and batch interfaces using SFTP file transfers. It can both send and receive messages.

### 3.1 General Message Format

#### 3.1.1 Syntax

- All HL7 messages begin with \x0B (ASCII 11) and terminate with \x1C (ASCII 28) and \x0D (ASCII 13).
- Each message segment ends with the carriage return character (\x0D, ASCII 13).
- Field sequences in the message segments are separated by "|" (\x7C, ASCII 124).
- Field components are separated by "^" (\x5E, ASCII 94).
- Field sub-components are separated by "&" (\x26, ASCII 38).
- Repeated fields are separated by "~" (\x7E, ASCII 126).
- Special characters are escaped using \ (backslash, ASCII 92, hex 0x5C).
- Any message segment not listed in our conformance statement will be ignored on inbound messages.

#### 3.1.2 UTC Offsets

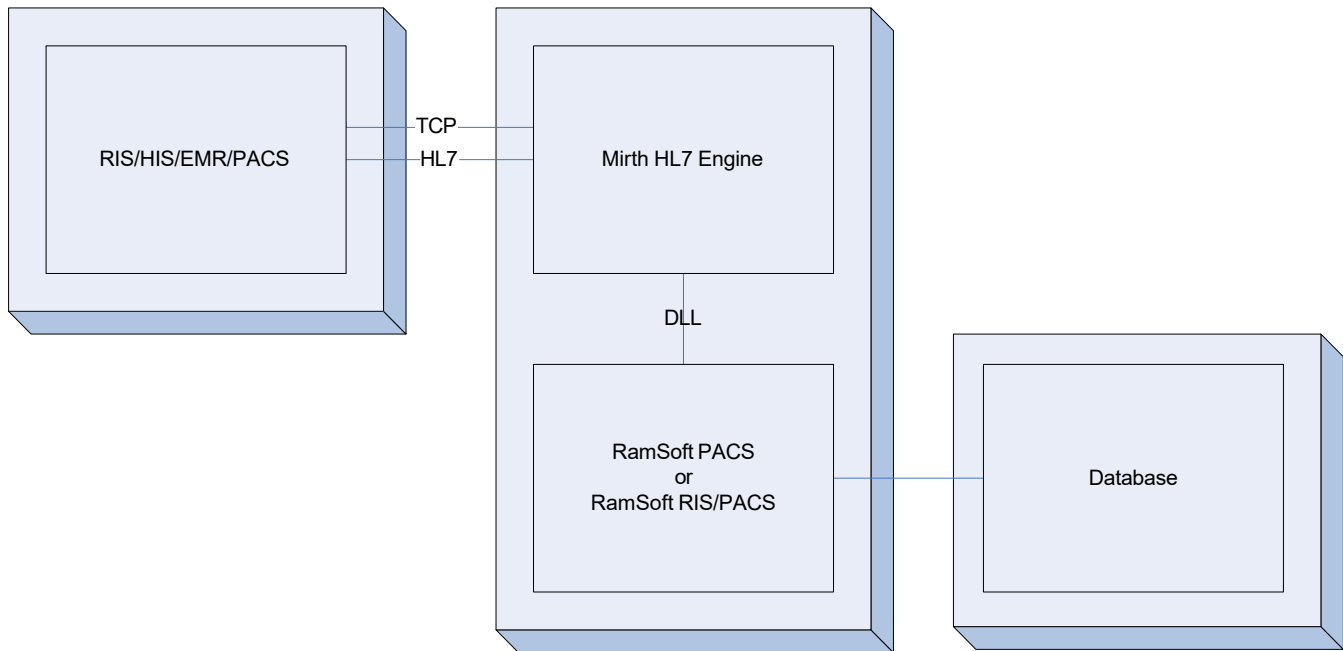
- All time fields are processed with UTC Offset, if present. If no time zone is present, then the server's UTC Offset is used to interpret time.

#### 3.1.3 Message Header Requirements

- *MSH-10.1* contains the Message ID. The Message ID uniquely identifies the message and is sent back to the sending system in the Message acknowledgement segment (MSA). This field is mandatory.

### 3.2 Deployment Diagram

The following deployment diagram describes a typical RMC setup in the field. The situation depicted in the diagram shows a very simple deployment case where one RIS is sending and receiving HL7 messages to and from the RMC. The Mirth HL7 engine is normally on the same machine as the RamSoft server. Many installations also have the database on the same machine, however, in this diagram it resides on its own dedicated server. This diagram is provided for clarity, but more complicated setups are supported. Please speak with a RamSoft Sales Representative to find out if we can meet your needs.



**Figure 1: Typical Deployment**

### 3.3 Message Queuing

RMC uses a message queue to manage outbound message transmission, ensuring reliable delivery even when the receiving system is temporarily unavailable.

#### 3.3.1 Queue Algorithm

1. Events are added to the message queue based on trigger events when "Mirth HL7 Enabled" is set to true in System Configuration.
2. RMC polls the Message Queue at a specified time interval (default: every second).
3. The message queue contents are processed, and all data necessary to construct the queued messages are consolidated and HL7 messages are created for each queue entry. These messages are then dispatched to the receiving system.
4. All sent messages are recorded to RMC Database.
5. If the message was delivered, the external system will send an ACK (acknowledgement) HL7 message back to RMC for every message that was sent to it. These ACKs should have the same *MSA-2 Message Control ID* as the messages they are replying to. In case of failure in delivering messages, we continue retrying for a configurable number of times. If all retries fail, the status of the message in queue will be marked as error to prevent further attempts but will remain in the queue. After fixing the network problem, the message status can be changed to normal, and RMC will resend this message.
6. ACKs are processed to gather the *MSA-2 Message Control ID* field's contents. This is used to delete any entries corresponding to that ID from the message queue.

### 3.4 General Storing in DB

1. By default, all values are stored in RamSoft DB with upper case.
2. Some values can be stored as case sensitive (original value) according to conditions (see section 0 **SEGMENT DEFINITIONS**).

## 4 ERROR HANDLING & REJECTION

### 4.1 ACK Code Behavior

| ACK Code | Mode     | Meaning            | RMC Behavior                                  |
|----------|----------|--------------------|-----------------------------------------------|
| AA       | Original | Application Accept | Message deleted from queue                    |
| AE       | Original | Application Error  | Message retried up to <b>maxRetries</b> times |
| AR       | Original | Application Reject | Message retried up to <b>maxRetries</b> times |
| CA       | Enhanced | Commit Accept      | Message deleted from queue                    |
| CE       | Enhanced | Commit Error       | Message retried up to <b>maxRetries</b> times |
| CR       | Enhanced | Commit Reject      | Message retried up to <b>maxRetries</b> times |

### 4.2 Rejection Scenarios

| Scenario                            | Segment | Condition                    | Result                                                                    |
|-------------------------------------|---------|------------------------------|---------------------------------------------------------------------------|
| Missing patient ID                  | PID-3.1 | Blank or absent              | Message rejected                                                          |
| Missing prior patient on merge      | MRG-1.1 | Blank or absent              | Message rejected                                                          |
| Missing username on user management | ZLI-1   | Blank or absent              | Message rejected                                                          |
| Missing user action                 | MFE-1   | Blank or absent              | Message rejected                                                          |
| Missing role                        | STF-4   | Blank or absent              | Message rejected                                                          |
| Missing accession number            | OBR-18  | Blank or absent              | Message rejected                                                          |
| Duplicate signed report             | OBX-3.1 | Report UID already exists    | Message rejected (configurable via <b>allowDuplicateSignedOrUnbound</b> ) |
| HealthcareService not found         | RGS.3   | No match by name in facility | SIU message rejected                                                      |

#### Retry Behavior

- RMC retries failed outbound messages up to a configurable number of attempts (maxRetries, default: 50)
- If all retries are exhausted, the message status is marked as E and removed from active retry
- The message remains in the queue and can be manually reactivated after the underlying issue is resolved.

#### Error Logging

- All errors are logged to the database

## 5 MESSAGES DEFINITION

### 5.1 Acknowledgement ACK

The ACK message is sent whenever another message has been successfully received and processed. RMC logs ACK messages both inbound and outbound. Inbound ACK messages are logged under the Source connector under the response. Outbound the ACK messages are logged on to the message Destination under the response.

| Segment Name | Segment Description     |
|--------------|-------------------------|
| MSH          | Message Header          |
| MSA          | Message Acknowledgement |

#### 5.1.1 ACK Sample Message

```
MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-0400||ACK|101|P|2.3.1|||||
MSA|AA|104|Request was Successfully processed
```

### 5.2 Negative Acknowledgement ACK

The negative ACK message is sent whenever another message has been successfully received but unsuccessfully processed. RMC logs Negative ACK messages both inbound and outbound. Inbound Negative ACK messages are logged under the Source connector under the response. Outbound the Negative ACK messages are logged on the message Destination under the response.

| Segment Name | Segment Description     |
|--------------|-------------------------|
| MSH          | Message Header          |
| MSA          | Message Acknowledgement |
| ERR          | Error Comments          |

When RMC receives a negative ACK it does not try to resend the failed message.

#### 5.2.1 Negative ACK Sample Message

When there are exceptions:

```
MSH|^~\&|RAMSOFT|RECEIVING FACILITY|RAMSOFT|SENDING FACILITY|20101223202939-0400||ACK|101|P|2.3.1
MSA|AE|101|
ERR|^ ^^207&Application Internal Error
```

When the message is rejected:

```
MSH|^~\&|RAMSOFT|RECEIVING FACILITY|RAMSOFT|SENDING FACILITY|20101223202939-0400||ACK|101|P|2.3.1
MSA|AR|101|
ERR|^ ^^101&PID Segment does not exist in HL7 message
```

Note: RMC will try to resend messages for a configurable number of retries when an AR response is received.

### 5.3 Patient Create / Update

Patient Create / Update message (ADT^A08) is used to register a new patient or update an existing patient's information. Patient Merge must be used when Patient ID or Issuer of Patient ID has changed to avoid duplicate patients. RMC can be configured to ignore create/update messages for patients that were previously merged when the sending HIS/RIS systems can't filter messages on inactive patients from sending, so the patients won't be added again to the RamSoft DB.

| Segment Name | Segment Description    |
|--------------|------------------------|
| MSH          | Message Header         |
| EVN          | Event Type             |
| PID          | Patient Identification |
| PV1          | Patient Visit          |
| [{AL1}]      | Allergy                |
| [{PRB}]      | Problem Codes          |
| [{DG1}]      | Diagnosis Codes        |
| [GT1]        | Guarantor              |
| [{IN1}]      | Insurance              |

RamSoft Extension: We have a parameter in the outbound channel configuration that allows GT1 and IN1 segments to be sent with the ADT^A08 message. The IHE standard requires these segments to be sent only in BAR messages. In this case, IN1 will be processed as described in Billing Account Create / Update.

## Sample Messages

MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939 -0400||ADT^A08|101|P|2.3.1|||||UNICODE UTF-8||  
EVN|A08|20101223202939-0400|||  
PID|P12345^^^ISSUER^MR|P12345^^^ISSUER^MR||PATIENT^TEST^M^^^^||19741018|M||2106 -3^WHITE^HL70005|10 808  
FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^US|||(909)481 -5872^^^qa@ramsoft.com|(909)481- 5800x 1||M||12345|286-50-9510|||2135-2^HISPANIC OR LATINO^HL70189|  
PV1|O|||||||||||||||||||||||||||||||||||||  
AL1|1||^PENICILLIN|SV|PRODUCES HIVES|  
AL1|2||^CAT DANDER|MI|RESPIRATORY DISTRESS|

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180507164 826-0400||ADT^A0 8|21478|P|2.3.1|||||UNICODE UTF-8||  
EVN|A08|20180507164826-0400|||  
PID|1|P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018|M||2131 -1^OTHER^HL70005|60 ADELAIDE STREET  
EAST^^TORONTO^ON^M5C3E4^CA||4166741347^^^S ALES@RAMSOFT.COM^^^9093535333|90948158001 ^^^^^4162345353|F  
RA|M||12345|1234564564ON|||2135-2^HISPANIC OR LATINO^HL70189|  
PV1|O|||||||||||||||||||||||||||||||||||||  
AL1|1||^PENICILLIN|SV|PRODUCES HIVES|  
AL1|2||^CAT DANDER|MI|RESPIRATORY DISTRESS|  
PRB||20180507164437 -0400|202063008^(ARTHROPATHY NOS! OF THE UPPER ARM) OR (ELBOW ARTHRITIS NOS)|||20180507000000 -0400  
PRB||20180507164525-0400|202793005^(BACK PAIN: [LUMBAR SPINE] OR [LOW] OR [ACUTE LUMBAR]) OR (LUMBALGIA) OR (LUMBAGO)|||20180507000000 -0400  
DG1|1|1|830.1^DISLOCATION OF JAW; OPEN DISLOCATION^I9CDX|||W|  
DG1|2|1|V00.131A^Fall from skateboard, initial encounter^I10||20180430121859|W|  
DG1|3|1|I50.21^Acute systolic (congestive) heart failure^I10||20180501121726|W|  
DG1|4|1|789.06^ABDOMINAL PAIN; EPIGASTRIC^I9CDX||20180430181157|W|

## 5.4 Patient Merge

Patient Merge message (ADT^A40) is used to merge two patients together or indicate that the Patient ID or Issuer of Patient ID has changed. The new patient is identified in the PID segment and the old patient is identified in the MRG segment.

| Segment Name | Segment Description       |
|--------------|---------------------------|
| MSH          | Message Header            |
| EVN          | Event Segment             |
| PID          | Patient Identification    |
| MRG          | Merge Patient Information |

### ADT^A40 Sample Message

```
MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-0400||ADT^A40|102|P|2.3.1||||
UNICODE UTF-8|
EVN|A40|20101223202939-0400|||
PID||P12345^^^ISSUER^MR|P12345^^^ISSUER^MR||PATIENT^TEST^M^^^^||19741018|M||2106-3^WHITE ^HL70005|10808
FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^US||(909)481 -5872^^^qa@ramsoft.com|(909)481 -
5800x1||M||12345|286-50-9510|||2135-2^HISPANIC OR LATINO^HL70189|
MRG|758026^^^ISSUER|||758026^^^ISSUER|
```

## 5.5 Patient Cancel / Delete

Patient Cancel / Delete message (ADT^A23) is used to delete a patient in the RamSoft database that has been registered. This message will also delete all studies associated with this patient.. RMC ignores this message if the specified patient record contains any study information to avoid accidental deletion of data.

| Segment Name | Segment Description    |
|--------------|------------------------|
| MSH          | Message Header         |
| EVN          | Event Type             |
| PID          | Patient Identification |

### Sample Message

```
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180430162310-0400||ADT^A23|21324|P|2.3.1||||UNICODE UTF-
8||EVN|A23|20180430162310-
0400|||PID|1|650642^^^RAMSOFT^MR|650642^^^RAMSOFT^MR||TEST^^^^|^||U||^|^^^^^|^^^^^^|^^^^^^|U|||||^|
```

## 5.6 Order Message

The Order Message (ORM^O01) is used for scheduling and updating orders for diagnostic imaging. It is strongly recommended to use this transaction set instead of the Scheduling transaction set to perform this task. RMC does not differentiate between order creation and order modification, so the same message is used to accomplish both tasks.

| Segment Name | Segment Description                                    |
|--------------|--------------------------------------------------------|
| MSH          | Message Header                                         |
| EVN          | Event Segment                                          |
| PID          | Patient Identification                                 |
| PV1          | Patient Visit                                          |
| ZVI          | Dose information                                       |
| ORC          | Common Order                                           |
| OBR          | Observation Request                                    |
| [NTE]        | Notes and Comments Segment                             |
| {[OBX]}      | Observation Result                                     |
| [GT1]        | Guarantor                                              |
| [{IN1}]      | Insurance                                              |
| [ZDS]        | Additional identification information (custom for IHE) |

The ZDS segment lies outside the repeatable segment group in this message. This ensures that all data within the repeatable segment group must pertain to a single study. RMC will send multiple ORC and OBR segments when multiple procedure codes exist for the study.

RamSoft Extension: We have a parameter in the outbound channel configuration that allows GT1 and IN1 segments to be sent with the ORM^O01 message.

RMC supports up to 3 active insurance segments (Primary, Secondary, and Tertiary) and unlimited inactive insurance segments.

### 5.6.1 Inbound Processing

Based on following algorithm, we consider the IN1 segment is active or inactive insurance.

IN1 segment #1:

- Active Primary insurance if insurance level is 1.
- Active Secondary insurance if insurance level is 2.
- Active Tertiary insurance if insurance level is 3.
- Inactive insurance if insurance level is empty or does not match any of insurance level

IN1 segment #2:

- Active Secondary insurance if insurance level is 2 and IN1 segment #1 is active Primary insurance
- Active Tertiary insurance if insurance level is 3 and IN1 segment #1 is active Primary insurance or active Secondary insurance
- Otherwise, inactive insurance

IN1 segment #3:

- Active Tertiary insurance if insurance level is 3 and IN1 segment #1 is active Primary insurance and IN1 segment #2 is active Secondary insurance
- Otherwise, inactive insurance

Other IN1 segments:

- Inactive insurances

As long as there is at least one active insurance, any existing active insurances for the patient that are not received in IN1 segments (active insurances) will be marked as "Inactive".

### 5.6.2 Outbound Processing

- Send active insurances for the patient
- Allow to send inactive insurances for the patient if the config ALLOW\_SEND\_INACTIVE\_INSURANCES\_OUTBOUND is "true".

IN1 segments are populated as following rules:

- IN1 segment for active insurances is populate first, then IN1 segments for inactive insurances.
- The order of insurance type: Primary insurance is first, then Secondary insurance. Last is Tertiary insurance.

For example, if the patient has Primary, Secondary and Tertiary active insurances and Primary, Secondary and Tertiary inactive insurances, the order of IN1 segments is following:

IN1 segment #1 – Primary Insurance.  
IN1 segment #2 – Secondary Insurance  
IN1 segment #3 – Tertiary Insurance.  
IN1 segment #4 – Inactive Primary Insurance.  
IN1 segment #5 – Inactive Secondary Insurance  
IN1 segment #6 – Inactive Tertiary Insurance.

If the patient has Secondary and Tertiary active insurances and Secondary and Tertiary inactive insurances, the order of IN1 segments is following:

IN1 segment #1 – Secondary Insurance  
IN1 segment #2 – Tertiary Insurance.  
IN1 segment #3 – Inactive Secondary Insurance  
IN1 segment #4 – Inactive Tertiary Insurance.

If patient has only one type of active insurance this insurance and Primary, Secondary and Tertiary inactive insurances, the order of IN1 segments is following:

IN1 segment #1 – Active Insurance (can be Primary or Secondary or Tertiary)  
IN1 segment #2 – Inactive Primary Insurance.  
IN1 segment #3 – Inactive Secondary Insurance  
IN1 segment #4 – Inactive Tertiary Insurance.

### 5.6.3 Mapping of Orders to Studies

We support a 1-to-many mapping between orders and studies. Patient ID, Issuer of Patient ID, and Accession Number uniquely identifies a single study in our system. Patient ID and Issuer of Patient ID combination must be unique, Accession and Issuer of Patient ID combination must be unique. Study Instance UID also uniquely identifies a single study.

### 5.6.4 Inbound Algorithm to Match Order to Study

We use the following algorithm to locate the study record to update:

1. If *ZDS-1* contains Study Instance UID, then we use this field exclusively to locate the study to update. Otherwise, proceed to step 2.
2. We locate the patient record based on Patient ID and Issuer of Patient ID as described in the PID segment. If no match is found, then we create a new patient and study. For the located patient, we locate the study using *OBR-18.1* as Accession Number. Patient ID and Accession number are required fields. If PatientID or Accession Number are empty the HL7 message will be rejected.
3. If a match is not found, we create a new study.

### 5.6.5 Inbound Processing

We support multiple studies (multiple accession numbers) per ORM message. We perform an iteration for each repeating field (Accession Number) in *OBR-18.1*.

1. If this Accession Number is identical, then
  - a) Update study information based on the first ORC / OBR segment and store procedure information based on all OBR segments.
  - b) If *OBR-4.1* matches a valid Study Type Code in our database, then we update this study using this Study Type Codes' description and procedure codes attached to this Study Type Code. We also process procedure codes in *OBR-44.1* from all OBR segments.
  - c) If *OBR-4.1* does not match a valid Study Type Code, we update this study using *OBR-4.2* as Study Description and procedure codes in *OBR-44.1* from all OBR segments.
2. If this Accession Number is not identical, then
  - a) Create study information based on the first ORC / OBR segment and store procedure information based on all OBR segments. Set this Accession Number for this study information.
  - b) If *OBR-4.1* matches a valid Study Type Code in our database, then we create this study using this Study Type Codes' description and procedure codes attached to this Study Type Code. We also process procedure codes in *OBR-44.1* from all OBR segments.
  - c) If *OBR-4.1* does not match a valid Study Type Code, we create this study using *OBR-4.2* as Study Description and process procedure codes in *OBR-44.1* from all OBR segments.
3. If multiple accession numbers are found after processing, then these studies will be grouped.

### Sample Messages

```
MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-0400||ORM^O01|104|P|2.3.1||||| UNICOD
UTF-8||
EVN|O01|20101223202939-0400|||
PID|P12345^^^ISSUER^MR|P12345^^^ISSUER^MR||PATIENT^TEST^M^^^^||19741018|M||2106-3^WHITE ^HL70005|10808
FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^US||((909)481 -5872^^^qa@ramsoft.com|(909)481- 5800x 1||M||12345|286-50-
9510||2135-2^HISPANIC OR LATINO^HL70189|
PV1||O|ER^ER^^MEDICAL CENTER^^^^^ER|||1234567890 ^JONES ^SAMUEL^^MD^|1234567890 ^JONES ^SAMUEL^^MD^|
306507^SMITH^JOHN^^MD^~6897 89^JONES^ED^^MD^|
ORC|SC|A123456|A123456|SC||1^^^201106150 25434-0400^^R^^^^||20110704211036-
0400|FRONTDESK||1234567890^JONES^SAMUEL^^MD^|^^^MEDICAL CENTER|8883439146|||MEDICAL CENTER|
OBR||A123456|A123456|70100^XRAY JAW < 4 VIEWS^^^^||20110704211036-0400|||R|Patient was in an
altercation||^JAW^|1234567890 ^JONES ^SAMUEL^^MD^||A123456|RP 890|A123456|||CR||^201106150 25434 -
0400^^R^^^^||WALK|830.1^DISLOCATION OF JAW; OPEN
DISLOCATION^|2345678901&PATEL&APU&&MD&||&LEVINSON&KERRY&K&RT&||&TRANKLIN&KATY&K&&|||PATIENT WAS
DRUNK||U||70100^XRAY JAW < 4 VIEWS^^^^||
NTE|1|O|CLINICAL NOTES|RE|
OBX|1|ST|^BODY HEIGHT||1.69|m||||F|||||
OBX|2|ST|^BODY WEIGHT||75|kg||||F|||||
ZDS|1.2.124.113540.0.0.3.725.4^RAMSOFT^Application^DICOM|
```

```
MSH|^~&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20170301102640-0500||ORM^O0 1|4710|P|2.3.1|||||UNICODE UTF-8||
EVN|O01|20170301102640-0500|||
PID|1|RAM2054^^^VM-CLINICAID^MR|RAM2054^^^VM-
CLINICAID^MR||TESTER^PAT^M^^MS.|SWEET^MOM| 19850302|F||UNK^DECLINED^HL70005|23 DUVAL ST^^KEY
WEST^FL^33040^US||3055552244^^^T EST@RAMS OFT.COM^^^3051122255|3056655522^^^^^^| ENG|S|||01234567 8|||UNK^DECL
INED^HL70189|
PV1|1|O|XRAY^AN73-XRAY1^^BLUEWATER -
ONTARIO^^^^^|||0011223344^TESTER^REFERRING^^^^^^^^^^^^^|0011223344^TESTER^REF ERRING^^^^^^^^^^^^^|||||||||RAM46
|||||||||||||||||20170301094804||0.00|||||V|
ORC|SC|RAM2058|RAM2058||ZZ||1^^^2017030 1094804 -0500^^R^^^||20 17030110 2640-
0500|RAMSOFT||0011223344^TESTER^REFERRING^^^^^^^^^^^^^|BLUEWATER - ONTARIO|||BLUEWATER - ONTARIO||
OBR|1|RAM2058|RAM2058|CXR^CHEST XRAY|||20170301102640 -
0500|||R|||^^^CHEST^B|0011223344^TESTER^REFERRING^^^^^^^^^^^^^|RAM20 58|20 58| RAM2058|||CR|||1^^^20170301094 804 -
0500^^R^^^||WALK|R05^Cough^I10~R06.02^Shortness of
breath^I10|1144778899&AL&TEST&&&||&&&&&&&&&&&&|||||U|||71020^CHEST X-RAY 2VW FRONTAL\T\LATL|
NTE|1|O||RE
ZDS|1.2.124.113540.0.201604121019.3.20 58^RAMSOFT^Application^DICOM
GT1|1|2054|TESTER^PAT^M^^MS.||23 DUVAL ST^^KEY
WEST^FL^33040^US|3055552244|3056655522|19850 302|F||SEL|||||RAMSOFT, INC.|60 ADELAIDE ST, STE
700^^TORONTO^ON^M5C3R4^CA|8883439146||1|||||||||||||||||TEST^EMERGENCY^CONTACT^^MS.|||OTH|||||
IN1|1|123456789|CAR132^AETNA01|AETNA|PO BOX 441^^KEY WEST^FL^33040^US|DOROTHY|8004111441^^^^^^^^^|123|||RAMSOFT,
INC.|20170101|||CM|TESTER^PAT^M|SEL|19850302|23 DUVAL ST^^KEY WEST^FL^33040^US|||||||||PAY111|||||1|F|60 ADELAIDE ST ,
STE 700^^TORONTO^ON^M5C3R4^CA|||||1234567 89
```

## 5.7 Master Files Notification

MFN^M02 message is used for sending the user information to other vendors or between RamSoft systems.

| Segment Name | Segment Description        |
|--------------|----------------------------|
| MSH          | Message Header             |
| MFI          | Master File Identification |
| {MFE}        | Master File Entry          |
| {STF}        | Staff Identification       |
| {PRA}        | Practitioner Information   |
| {ZLI}        | Custom Staff Information   |

### 5.7.1 Inbound Processing

We use following behavior to perform inserting/updating/deleting a user based on value of MFE.1 (NOTE: Password exchange can only happen between Ramsoft systems)

- For MAD/MUP:
  - o If the input user exists: perform updating this existing user
  - o Otherwise: perform inserting new user
- For MAC/MDC:
  - o If the input user exists: perform updating this existing user status with status of (MAC/MDC)
  - o Otherwise: perform inserting new user with status of (MAC/MDC)
- For MDL:
  - o Only perform deleting if this user exists
- For inserting user password to add new user:
  - o If SALT (ZLI.3) is present, insert inbound password.
  - o Otherwise, insert default password.
- For updating user password:
  - o Only update password if SALT is present.

- If user imaging facility (STF.8) is present, this imaging facility is created in DB.
- The interface user will handle setting both Role and Group to allow receiving inbound message from external systems.
- Message is rejected if role (STF.4.1) or group (ZLI.4) is not provided.

## 5.7.2 Outbound Processing

1. We send user information in each MFN message.
2. We are based on the value of MFE.1 to identify which events of user and send it out:
  - a. MAD: add a new user
  - b. MUP: update an existing user
  - c. MDC: deactivate an user
  - d. MAC: Reactivate an user

## Sample Messages

```
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|2018050918000 5-0400||MFN^M02|21569|P| 2.3.1|||||UNICODE UTF-8||
MFI|PRA|RAMSOFT|UPD||20180509180005-0400|NE
MFE|MAD|21569|20180509180005-0400||
STF||111^^1234567890^^|TEST^RADIOLOGIST^M^MD^DR.|INTERPRETING
MD|F|19550202000000|A|||3055552222^^O~30 55552211^^C~30 55559999^^B~3055552221^^F|23 DUVAL ST^^KEY
WEST^FL^33040^US||||Sales@RamSoft.com||||user notesPRA
||ALL STUDIES||||123DEA^DEA~321LICNUM^SL^FL^^^US~ 1234 567890^NPI
ZLI|TESTRAD|65F90C0849C738089AA4DD1B53541 DC84EF 89EBB 55CB 295170445FD8E6ADF 510 5646ECCF3647839434C 80BC3B5EC
5BA1E024976BF142F1ECF822CB91FC08D078|C 11ACFE2419849BE8DBF1BD9E57A1170|ALL STUDIES
```

```
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180509181140 -0400||MFN^M02| 21572|P|2.3.1|||||UNICODE UTF-8||
MFI|PRA|RAMSOFT|UPD||20180509181140 -0400|NE
MFE|MDC|21572|20180509181140 -0400||
STF||111^^1234567890^^|TEST^RADIOLOGIST^J^MD^DR.|INTERPRETING
MD|F|19550202000000|I|||3055552222^^O~3055552211^^C~3055559999^^B~30 55552221^^F|23 DUVAL ST^^KEY
WEST^FL^33040^US||||Sales@RamSoft.com||||user notesPRA
||ALL STUDIES||||123DEA^DEA~321LICNUM^SL^FL^^^US~ 1234 567890^NPI
ZLI|TESTRAD|65F90C0849C738089AA4DD1B53541 DC84EF 89EBB 55CB 295170445FD8E6ADF 510 5646ECCF3647839434C 80BC3B5EC
5BA1E024976BF142F1ECF822CB91FC08D078|C 11ACFE2419849BE8DBF1BD9E57A1170|ALL STUDIES
MSH|^~\&|RAMSOFT|PROD_RC11567|Practice Suite||20140103061314||MFN^M02|960fdb0e-2a7e-4550-a5ab-
bd12db57ebd7|P|2.5|||||UNICODE UTF-8||
MFI|PRA|RAMSOFT|UPD||20140103061314|NE
MFE|MAD|960fdb0e-2a7e-4550-a5ab-bd12db57ebd7|20140103061314||
STF|1435826|^^^|CITYTEST^CITYTEST^|STAFF||A|||(111)589-1770|30581 Stephenson Hwy.^STES Heights^CA^121212||||||
ZLI|CITYTEST1|AA130103AFEF1AF9957EEAA51DD8E83A
```

```
MSH|^~\&|RAMSOFT|PROD_RC11567|Practice Suite||20140203061314||MFN^M02|960fdb0e-2a7e-4550-a5ab-
bd12db57ebd7|P|2.5|||||UNICODE UTF-8||
MFI|PRA|RAMSOFT|UPD||20140203061314|NE
MFE|MDC|960fdb0e-2a7e-4550-a5ab-bd12db57ebd7|20140203061314||
STF|1435826|^^^|CITYTEST^CITYTEST^|STAFF||A|||(111)589-1770|23123 Stephenson Hwy.^TEST Heights^CA^121212||||||
ZLI|CITYTEST1|AA130103AFEF1AF9957EEAA51DD8E83A
```

## 5.8 Observation Result Unsolicited

The Observation Result message (ORU^R01) is used to transmit the results of diagnostic studies. Reports can be sent with a status of "A" for Addendum, "F" for Final and "P" for Preliminary report. Reports can be sent and received in various formats as following:

- Plain Text Format
- RTF Format
- Base64Encoded String (Word Format)
- Base64Encoded String (PDF Format)

Note: PDF is not considered a diagnostic report for inbound report. RamSoft will accept Diagnostic Reports inbound in this format, but will only be able to store PDF content and title of report (preliminary or final only), neither signing physician nor signing date/time are stored for PDF reports.

RamSoft does support conversion of text/word diagnostic reports and sending those in PDF format *outbound* (sample is provided in [section 3.8.3.5](#)).

- Base64Encoded String (PDF Format) are accepted inbound for other types of documents;

| Segment Name | Segment Description         |
|--------------|-----------------------------|
| MSH          | Message Header              |
| EVN          | Event Type                  |
| PID          | Patient Identification      |
| [PV1]        | Patient Visit Information   |
| {ORC}        | Common Order Segment        |
| OBR          | Observation Request Segment |
| [NTE]        | Notes and Comments Segment  |
| {OBX}        | Observation Result          |

Report text can be contained within a single OBX segment or multiple consecutive OBX segments. In the latter case, each OBX segment corresponds to a single line of text in the report.

### 5.8.1 Inbound Processing

1. We use the following algorithm to locate the study record to store the report:
  - a. We locate the patient record based on Patient ID and Issuer of Patient ID as described in the PID segment. If no match is found, then we create a new patient and study.
  - b. For the located patient, we match *OBR-18.1* to Accession Number. Patient ID and Accession number are required fields. If PatientID or Accession Number is empty the HL7 message will be rejected.
  - c. If no match is found, then we create a new patient and study.
2. All reports sent within a single ORU message must belong to the same study.
3. Each ORC, OBR, {OBX} sequence could contain a single report. A single report may consist of multiple OBX segments.
4. Plain text reports
  - a. Each OBX segment is treated as a new line.
  - b. Each occurrence of '\.br\' is treated as a new line.
  - c. Each occurrence of any combination of line feed and carriage return escape sequence '\E\n', '\E\r', '\r\n' is treated as a new line.
  - d. Each occurrence of any combination of line feed and carriage return hex sequence '\X0D\'', '\X0A\'', '\X0D0A\'', '\X0A0D\' hex sequence is treated as a new line.
  - e. Each occurrence of '~', '\R\' is treated as new line.
  - f. Will be inserted onto the Global Template set in PowerReader or onto Facility Template when matching facility is found. Facility Templates override the Global Template.

### 5.8.2 Outbound Processing

1. We send a single report in each ORU message.
2. For plain text reports, line feeds (any combination of line feed and carriage return) are replaced with OBX\_LINEBREAK string or denoted by a segment break if OBX\_LINEBREAK is NULL.
3. For plain text reports, OBX\_SPLIT\_DELIMITERS are denoted by segment breaks.
4. Segment breaks are also inserted when the segment size exceeds OBX\_SEGMENT\_SIZE. Plain text, RTF, and HTML OBX segments are broken at a blank space (word wrapped), unless there is a word that exceeds the segment size.

## Sample Messages Report in Text Format

```
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|2018050 1170708-0400||ORU^R01| 21436|P|2.3.1|||||UNICODE UTF-8|
8|EVN|R01|20180501170708-0400||||PID|1|P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018| M||2131 -
1^OTHER^HL70005|60 ADELAIDE STREET
EAST^^TORONTO^ON^M5C3E4^CA||4166741347^^^S ALES@RAMSOFT.COM^^^9093535333|90948158001 ^^^^^^4162345353|F
RA|M||12345|1234564564ON||||2135-2^HISPANIC OR
LATINO^HL70189|PV1|1|O|XRAY^XRAY1^^RAMSOFT^^^^^|||0001114478^TESTER^REF^^^^^^^^^^^^^^|0001114478^TESTER^REF^^
^^^^^^^^^|||||A1||||RAM208|||||||||||||20180501121239|450.00||||V|ORC|SC|RAM842|RA M84 2||ZZ||1^^^201 80501 15150 0-
0400^^R^^^||20180501170708-0400|HARMONY||0001114478^TESTER^REF^^^^^^^^^^^^^^|RAMSOFT|3055551111||RAMSOFT||OBR|1|RAM84 2 |RAM842|CXR-
PALAT^CHEST X-RAY PA AND LATERAL VIEWS|||20180501170708-0400||||R|I50.21 - Acute systolic (congestive) heart
failure||^CHEST^|0001114478^TESTER^REF^^^^^^^^^^^^^^| 3055551111|RAM842|842|RAM842||||DX|||1^^^20180 501151500 -
0400^^R^^^||WALK|I50.21^Acute systolic (congestive) heart failure^I10|0001112224&TEST&RAD&&&DR.||&&&&&|&&&&&|||patient
SOB||U||71048^X-RAY EXAM CHEST 4+ VIEWS|NTE|1|O|AP and lateral images of the chest were obtained in the seated
position.|REOBX|1|FT|1.2.124.113540.1.4.1970578261.9328.1525208097.107 ^TXT^1||\br\.\br\PATIENT NAME: PATIENT, TEST M JR
MR.\br\.\br\D.O.B: 18-Oct-1974 AGE: 43 years \br\.\br\DATE: 01-May-2018 03:15:00 PM.\br\.\br\MR NUMBER:
P12345.\br\.\br\ORDERING PHYSICIAN: TESTER, REF.\br\.\br\EXAM: CHEST X-RAY PA AND LATERAL VIEWS \br\.\br\HISTORY: Acute
systolic (congestive) heart failure. \br\.\br\TECHNIQUE: AP and lateral images of the chest were obtained in the seated
position.\br\.\br\FINDINGS: The lungs appear hyperaerated. Retrocardiac lucency may be due to gas in the \br\carina. Small patchy
density in the lateral and posterior left lung base may represent lower lobe \br\inflammatory or fibrotic change. No pleural effusion
is seen. There is no vascular congestion.\br\The cardiac size appears satisfactory. \br\No soft tissue or bony abnormality is
identified.\br\.\br\IMPRESSION: \br\Small patchy density at the left lung base is possibly inflammatory or fibrotic. \br\Correlate
clinically and perhaps with prior radiographs. \br\.\br\.\br\Electronically Signed by TEST, RAD DR. at 5/1/2018 4:53:57 PM.\br\
5/1/2018 4:53:57 PM.\br\.\br\.\br\|||||F|||20180501165357-0400||0001112224^T EST^RAD^^^DR.|FINAL
```

### 5.8.2.1 Report in Text Format With Financial segments (GT1 and IN1) and OBX segments with height and weight included

```
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|2018050 1170523-0400||ORU^R01| 21435|P|2.3.1|||||UNICODE UTF-8|
EVN|R01|20180501170523-0400||||
PID|1|P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018| M||2131 -
1^OTHER^HL70005|60 ADELAIDE STREET
EAST^^TORONTO^ON^M5C3E4^CA||4166741347^^^S ALES@RAMSOFT.COM^^^9093535333|90948158001 ^^^^^^4162345353|F
RA|M||12345|1234564564ON||||2135-2^HISPANIC OR LATINO^HL70189|
PV1|1|O|XRAY^XRAY1^^RAMSOFT^^^^^|||0001114478^TESTER^REF^^^^^^^^^^^^^^|00011144 78^TESTER^REF^^^^^^^^^^^^^^|A
1||||RAM208|||||||||||||20180501121239|450.00||||V|
OBX|1|ST|^BODY HEIGHT||1.7269999999999999|m||||F||||
OBX|2|ST|^BODY WEIGHT||61.7|kg||||F||||
GT1|1|404|PATIENT^TEST^M^JR^MR.||60 ADELAIDE STREET
EAST^^TORONTO^ON^M5C3E4^CA||4166741347|9094815800 1|19741018|M||SEL||||RAMS OFT|9480 UTICA AVE^^RANCHO
CUCAMONGA^CA^91730^US|9094815800|1|||||||||||||TESTER^CONTACT^M^MS.|4165555511|OTH|||||
IN1|1|9998875B44|984228^AETNA01|AETNA|PO BOX 981106^^EL PASO^TX^799981106^US|BARBARA
MONTA|8006240756^*****|BBB590 5|||RAMSOFT|20180401||CM|PATIENT^TEST ^M|SEL|19741018|60 ADELAIDE STREET
EAST^^TORONTO^ON^M5C3E4^CA|||||||||||||U45677|||||1|M|9480 UTICA AVE^^RANCHO
CUCAMONGA^CA^91730^US|||||9998875B44
ORC|SC|RAM842|RAM842||ZZ||1^^^20 180 501151500 -0400^^R^^^||2018050 1170523-
0400|HARMONY||0001114478^TESTER^REF^^^^^^^^^^^^^^|RAMSOFT|3055551111||RAMSOFT||
OBR|1|RAM842|RAM842|CXR-PALAT^CHEST X-RAY PA AND LATERAL VIEWS|||20180501170523-0400||||R|I50.21 - Acute systolic
(congestive) heart
failure||^CHEST^|0001114478^TESTER^REF^^^^^^^^^^^^^^| 3055551111|RAM842|842|RAM842||||DX|||1^^^20180 501151500 -
0400^^R^^^||WALK|I50.21^Acute systolic (congestive) heart failure^I10|0001112224&TEST&RAD&&&DR.||&&&&&|&&&&&|||patient
SOB||U||71048^X-RAY EXAM CHEST 4+ VIEWS|
```

NTE|1|O|AP and lateral images of the chest were obtained in the seated position.|REOBX|1|FT|1.2.124.113540.1.4.1970578261.9328.1525208097.107^TXT^^1|||.br\\|.br\PATIENT NAME: PATIENT, TEST M JR MR.|.br\\|.br\D.O.B: 18-Oct-1974 AGE: 43 years |.br\\|.br\DATE: 01-May-2018 03:15:00 PM|.br\\|.br\MR NUMBER: P12345|.br\\|.br\ORDERING PHYSICIAN: TESTER, REF|.br\\|.br\EXAM: CHEST X-RAY PA AND LATERAL VIEWS |.br\\|.br\HISTORY: Acute systolic (congestive) heart failure. |.br\\|.br\TECHNIQUE: AP and lateral images of the chest were obtained in the seated position.|.br\\|.br\FINDINGS: The lungs appear hyperaerated. Retrocardiac lucency may be due to gas in the |.br\carina. Small patchy density in the lateral and posterior left lung base may represent lower lobe |.br\inflammatory or fibrotic change. No pleural effusion is seen. There is no vascular congestion.|.br\The cardiac size appears satisfactory. |.br\No soft tissue or bony abnormality is identified.|.br\\|.br\IMPRESSION: |.br\Small patchy density at the left lung base is possibly inflammatory or fibrotic. |.br\Correlate clinically and perhaps with prior radiographs. |.br\\|.br\\|.br\Electronically Signed by TEST, RAD DR. at 5/1/2018 4:53:57 PM|.br\5/1/2018 4:53:57 PM|.br\\|.br\\|.br\\|.br\\| |||||F|||20180501165357 -0400||0001112224^TEST^RAD^^^DR.|FINAL

#### 5.8.2.2 Report in RTF

[http://software.ramsoft.com/apps/HL7%20SAMPLE%20MESSAGES/ORU\\_RTF.txt](http://software.ramsoft.com/apps/HL7%20SAMPLE%20MESSAGES/ORU_RTF.txt)

#### 5.8.2.3 Report in Word Format (Base64Encoded)

[http://software.ramsoft.com/apps/HL7%20SAMPLE%20MESSAGES/ORU\\_WORD.txt](http://software.ramsoft.com/apps/HL7%20SAMPLE%20MESSAGES/ORU_WORD.txt)

#### 5.8.2.4 Report in PDF Format (Base64Encoded)

[http://software.ramsoft.com/apps/HL7%20SAMPLE%20MESSAGES/ORU\\_PDF.txt](http://software.ramsoft.com/apps/HL7%20SAMPLE%20MESSAGES/ORU_PDF.txt)

Note: PDF is not supported for Diagnostic Reports (Type 1) inbound, but RamSoft does support PDF format outbound.

## 5.9 Lab Result

Similar to the Observation Result message, the Lab Result message is used for the transmission of patient labresult report.

| Segment Name | Segment Description         |
|--------------|-----------------------------|
| MSH          | Message Header              |
| EVN          | Event Type                  |
| PID          | Patient Identification      |
| [PV1]        | Patient Visit Information   |
| {ORC}        | Common Order Segment        |
| OBR          | Observation Request Segment |
| [NTE]        | Notes and Comments Segment  |
| [TQ1]        | Timing Model Segment        |
| OBX          | Observation Result          |
| [SPM]        | Specimen Segment            |

### 5.9.1 Inbound Processing

We use the following algorithm to distinguish a lab result message from an inbound ORU message:

- We check the LOINC type from OBX-3.1. If it is LOINC type, this message is lab result message.
- If there is no OBX segment, we check the value of SPM-21 and SPM-24. If SPM-21 and SPM-24 is not empty, this message is lab result message. If either SPM-21 and SPM-24 is empty or there is no SPM segment, this message is considered as result message.

## Lab Result Sample Message

MSH|^~\&#|NIST Test Lab APP|NIST Lab Facility||NIST EHR Facility|20110531140551-0500||ORU^R01^ORU\_R01|NIST-LRI-NG-001.00|T|2.5.1|||AL|NE||UNICODE UTF-8|||LRI\_Common\_Component^Profile  
Component^2.16.840.1.113883.9.16^ISO~LRI\_NG\_Component^Profile  
Component^2.16.840.1.113883.9.13^ISO~LRI\_RU\_Component^Profile Component^2.16.840.1.113883.9.14^ISO  
PID|1||PATID1234^^^NIST MPI^MR||Jones^William^A^JR^^^L||19610615| M||2106-3 ^White^HL70005^CAUC^Caucasian ^L  
ORC|RE|ORD723222^NIST EHR|R-783274^NIST Lab Filler|GORD874211^NIST EHR||||||57422^Radon^Nicholas^M^JR^DR^^^NIST -  
AA-1^L^^^NPI  
OBR|1|ORD723222^NIST EHR|R-783274^NIST Lab Filler|30341-2^Erythrocyte sedimentation rate^LN^815115^Erythrocyte  
sedimentation rate^99USI^^^Erythrocyte sedimentation rate|||20110331140551-0800||||L||7520000^fever of unknown  
origin^SCT^22546000^fever, origin unknown^99USI^^^Fever of unknown origin|||57422^Radon^Nicholas^M^JR^DR^^^NIST -  
AA-1^L^^^NPI|||||20110331160428-0800||||F||||10092^Hamlin^Pafford^M^Sr.^Dr.^NIST-AA-1^L ^^^NPI|||||||||||||CC^Carbon  
Copy^HL70507^C^Send Copy^L^^^Copied Requested  
NTE|1||Patient is extremely anxious about needles used for drawing blood.  
TQ1|1|||||20110331150028-0800|20110331152028-0800  
OBX|1|NM|30341-2^Erythrocyte sedimentation rate^LN^815117^ESR^99USI^^^Erythrocyte sedimentation  
rate||10|mm/h^millimeter per hour^UCUM|0 to 17|N||||F|||20110331140551-0800||||20110331150551-0800||||Century  
Hospital^^^^^NIST-AA-1^XX^^^987|2070 Test Park^^^Los  
Angeles^CA^90067^USA^B^06037|2343242^Knowsalot^Phil^J.^III^Dr.^NIST-AA-1^L^^^DN  
SPM|1||||119297000^BLD^SCT^BldSpC^Blood^99USA^^^Blood Specimen|||||||||20110331140551-  
0800|||||COOL^Cool^HL70493^CL^Cool^99USA^^^Cool

## 5.10 Scheduling

Scheduling messages may be received from an information system that does not support Order messages. It can also be sent by RMC whenever the status of the order (study information) is changed.

| Segment Name | Segment Description               |
|--------------|-----------------------------------|
| MSH          | Message Header                    |
| SCH          | Schedule Activity Information     |
| PID          | Patient Identification            |
| [PV1]        | Patient Visit Information         |
| {RGS}        | Resource Group                    |
| {AIS}        | Appointment Information – Service |
| [NTE]        | Notes and Comments                |

### 5.10.1 Inbound Processing

1. We support only one study per SIU message.
2. In the 1<sup>st</sup> AIS segment, we read *AIS-3-2* as the Study Description.
3. We process procedure codes in AIS-3.1 from all AIS segments.
4. We add any Procedure Codes that do not exist to our database.

### 5.10.2 Outbound Processing

We send SIU messages based on:

1. The change of status of the study. The following table shows different type of SIU message will be sent using the RamSoft Scheduler:

| Status of an appointment is changed to | Status of study is changed to    | SIU message types |
|----------------------------------------|----------------------------------|-------------------|
| Scheduled                              | Scheduled                        | S12               |
| Confirmed/Arrived/Ready For Scan       | Confirmed/Arrived/Ready For Scan | S14               |
| Need to reschedule/No show             | Scheduled/Cancelled              | S15               |
| Cancelled with notice                  | Cancelled                        | S17               |

2. Changing the date and time of an appointment or the resource: sends SIU^S14

### 5.10.3 Sample Messages

#### Message SIU S12

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180430173742-0400||SIU^S12|21358|P|2.3.1|||||UNICODE UTF-8||PID|1|P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018|M||2131-1^OTHER^HL70005|60 ADELAIDE STREET  
EAST^^TORONTO^ON^M5C3E4^CA||4166741347^^^SALES@RAMSOFT.COM^^^9093535333|90948158001^^^^^^4162345353|FRA|M||12345|1234564564ON|||2135-2^HISPANIC OR LATINO^HL70189|SCH|RAM841||||||||1^^30^20180430180000-0400^20180430183000-0400^R||||MR^MR1^^RAMSOFT^^^^^|0001114478^TESTER^REF^^^^^^^^^^^^^^|N|||||WAITLIST|RAM841|RAM841RGS|1||MR AIS|1||72148^MRI LUMBAR SPINE W/O DYE|20180430180000-0400|-240|min|30|min||WAITLISTNTE|1||car accident

#### Message SIU S14

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180430173026-0400||SIU^S14|21354|P|2.3.1|||||UNICODE UTF-8||PID|1|P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018|M||2131-1^OTHER^HL70005|60 ADELAIDE STREET  
EAST^^TORONTO^ON^M5C3E4^CA||4166741347^^^SALES@RAMSOFT.COM^^^9093535333|90948158001^^^^^^4162345353|FRA|M||12345|1234564564ON|||2135-2^HISPANIC OR LATINO^HL70189|SCH|RAM841||||||||1^^30^20180430183000-0400^20180430190000-0400^R||||MR^MR1^^RAMSOFT^^^^^|0001114478^TESTER^REF^^^^^^^^^^^^^^|N|||||WAITLIST|RAM841|RAM841RGS|1||MRAIS|1||72148^MRI LUMBAR SPINE W/O DYE|20180430183000-0400|-240|min|30|min||WAITLISTNTE|1||car accident

#### Message SIU S15

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180430173731-0400||SIU^S15|21356|P|2.3.1|||||UNICODE UTF-8||PID|1|P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018|M||2131-1^OTHER^HL70005|60 ADELAIDE STREET  
EAST^^TORONTO^ON^M5C3E4^CA||4166741347^^^SALES@RAMSOFT.COM^^^9093535333|90948158001^^^^^^4162345353|FRA|M||12345|1234564564ON|||2135-2^HISPANIC OR LATINO^HL70189|SCH|RAM841||||||||1^^^R||||MR^MR1^^RAMSOFT^^^^^|0001114478^TESTER^REF^^^^^^^^^^^^^^|PENDING|RAM841|RAM841RGS|1||AIS|1||72148^MRI LUMBAR SPINE W/O DYE||-240|min||||PENDING NTE|1||car accident

#### Message SIU S17

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180430174419-0400||SIU^S17|21360|P|2.3.1|||||UNICODE UTF-8||PID|1|P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018|M||2131-1^OTHER^HL70005|60 ADELAIDE STREET  
EAST^^TORONTO^ON^M5C3E4^CA||4166741347^^^SALES@RAMSOFT.COM^^^9093535333|90948158001^^^^^^4162345353|FRA|M||12345|1234564564ON|||2135-2^HISPANIC OR LATINO^HL70189|SCH|RAM841||||||||1^^^R||||MR^MR1^^RAMSOFT^^^^^|0001114478^TESTER^REF^^^^^^^^^^^^^^|CANCELLED|RAM841|RAM841RGS|1||AIS|1||72148^MRI LUMBAR SPINE W/O DYE|20180430180000-0400|-240|min||||CANCELLED NTE|1||car accident

## 5.11 Billing Account Create / Update

Billing Account messages (BAR^P01, BAR^P05) are used to create and update insurance information of the patient. Those messages are sent by RMC whenever patient or insurance information is created or updated.

| Segment Name | Segment Description    |
|--------------|------------------------|
| MSH          | Message Header         |
| EVN          | Event Type             |
| PID          | Patient Identification |
| GT1          | Guarantor              |
| IN1          | Insurance              |

RMC supports up to 3 insurance segments: Primary, Secondary, and Tertiary.

RMC supports up to 3 active insurance segments: Primary, Secondary, and Tertiary and ignore all inactive insurance segments

### 5.11.1 Inbound Processing

Based on following algorithm, we consider the IN1 segment is active or inactive insurance.

IN1 segment #1:

- Active Primary insurance if insurance level is 1.
- Active Secondary insurance if insurance level is 2.
- Active Tertiary insurance if insurance level is 3.
- Inactive insurance if insurance level is empty or does not match any of insurance level

IN1 segment #2:

- Active Secondary insurance if insurance level is 2 and IN1 segment #1 is active Primary insurance
- Active Tertiary insurance if insurance level is 3 and IN1 segment #1 is active Primary insurance or active Secondary insurance
- Otherwise, inactive insurance

IN1 segment #3:

- Active Tertiary insurance if insurance level is 3 and IN1 segment #1 is active Primary insurance and IN1 segment #2 is active Secondary insurance
- Otherwise, inactive insurance

Other IN1 segments:

- Inactive insurances

As long as there is at least one active insurance, any existing active insurances for the patient that are not received in IN 1 segments (active insurances) will be marked as "Inactive".

### 5.11.2 Outbound Processing

- Send active insurances for the patient
- Allow to send inactive insurances for the patient if the config ALLOW\_SEND\_INACTIVE\_INSURANCES\_OUTBOUND is "true".

IN1 segments are populated as following rules:

- IN1 segment for active insurances is populate first, then IN1 segments for inactive insurances.
- The order of insurance type: Primary insurance is first, then Secondary insurance. Last is Tertiary insurance.

For example,

If patient has Primary, Secondary and Tertiary active insurances and Primary, Secondary and Tertiary inactive insurances, the order of IN1 segments is following:

IN1 segment #1 – Primary Insurance.

IN1 segment #2 – Secondary Insurance

IN1 segment #3 – Tertiary Insurance.

IN1 segment #4 – Inactive Primary Insurance.

IN1 segment #5 – Inactive Secondary Insurance

IN1 segment #6 – Inactive Tertiary Insurance.

If patient has Secondary and Tertiary active insurances and Secondary and Tertiary inactive insurances, the order of IN1 segments is following:

IN1 segment #1 – Secondary Insurance

IN1 segment #2 – Tertiary Insurance.

IN1 segment #3 – Inactive Secondary Insurance

IN1 segment #4 – Inactive Tertiary Insurance.

If patient has only one type of active insurance this insurance and Primary, Secondary and Tertiary inactive insurances, the order of IN1 segments is following:

IN1 segment #1 – Active Insurance (can be Primary or Secondary or Tertiary)

IN1 segment #2 – Inactive Primary Insurance.

IN1 segment #3 – Inactive Secondary Insurance

IN1 segment #4 – Inactive Tertiary Insurance.

### Sample Messages

```
MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-  
0400||BAR^P01|108|P|2.3.1|||||UNICODE UTF-8||  
EVN|P01|20101223202939-0400||||  
PID||P12345^^^ISSUER|P12345^^^ISSUER||PATIENT^TEST^M^^^^||19741018|M||2131 -1|10808 Foothill Blvd^^Rancho  
Cucamonga^CA^91730^US|(909)481 -5872^^^qa@ramsoft.com|(909)481 -5800x1||M||12345|286-50-9510||2135-2|  
GT1|1||PATIENT^TEST^M^^^^||10808 Foothill Blvd^^Rancho Cucamonga^CA^91730^US|(909)481 -5872|(909)481-  
5800x1||M||SEL|||||RAMSOFT|9480 UTICA AVE^^Rancho Cucamonga^CA^91730^US|(909)481 -  
5800||1|||||BLUGGER^KENT^^^^|(909)555-5555||OTH|  
IN1|1|89765|BCBS|BLUE CROSS BLUE SHIELD|1 SUNSET BLVD^^BEVERLY HILLS^CA^90210^US|DAVID^^^^^^|(213)555-  
5555|G412343|||RAMSOFT|20101006||||PATIENT^TEST^M^^^^|SEL|19741018|10808 Foothill Blvd^^Rancho  
Cucamonga^CA^91730^US|||||1|M|9480 UTICA AVE^^Rancho Cucamonga^CA^91730^US||||89765  
IN1|2|89765|AUTOSTATE|CT LIFE|55 MELROSE PLACE^^BEVERLY  
HILLS^CA^90210^US||2135551234|897654||||20101006||CM|PATIENT^TEST^M|SEL|19741018|10808 Foothill  
BLVD^^Rancho Cucamonga^CA^91730^US|||||1|M|9480 UTICA AVE^^Rancho  
Cucamonga^CA^91730^US||||89765
```

```
MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-0400||BAR^P05|108|P|2.3.1|||||UNICODE
UTF-8||
EVN|P05|20101223202939-0400||||
PID||P12345^^^ISSUER^MR|P12345^^^ISSUER^MR||PATIENT^TEST^M^^^^||19741018|M||2106-3^WHITE ^HL70005|10808
FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^US||(909)481 -5872^^^qa@ramsoft.com|(909)481- 5800x 1||M||12345|286-50-
9510||2135-2^HISPANIC OR LATINO^HL70189|
GT1|1||PATIENT^TEST^M^^^^||10808 FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^US|(909)481 -5872|(909)481-
5800x1||M||SEL|||||RAMSOFT|9480 UTICA AVE^^RANCHO CUCAMONGA^CA^91730^US|(909)481 -
5800||1|||||BLUGGER^KENT^^^^|(909)555-5555||OTH|IN1|1|89765|BCBS|BLUE CROSS BLUE SHIELD|1 SUNSET
BLVD^^BEVERLY HILLS^CA^90210^US|^^^^^(213)555-
5555|G412343|||RAMSOFT|20101006|||PATIENT^TEST^M^^^^|SEL|19741018|10808 FOOTHILL BLVD^^RANCHO
CUCAMONGA^CA^91730^US|||||1|M|9480 UTICA AVE^^RANCHO
CUCAMONGA^CA^91730^US|||||89765|IN1|2|34212|AUTOSTATE|STATE FARM|55 MELROSE PLACE^^BEVERLY
HILLS^CA^90210^US|^^^^^(213)555-1234|NA|||RAMS OFT|20101006|||PATIENT^TEST^M^^^^|SEL|197410 18|10 808 FOOTHILL
BLVD^^RANCHO CUCAMONGA^CA^91730^US|||||1|M|9480 UTICA AVE^^RANCHO CUCAMONGA^CA^91730^US|||||34212|
```

## 5.12 Billing Account Cancel

Billing Account messages (BAR^P06) is used to cancel the insurance information of the patient.

| Segment Name | Segment Description    |
|--------------|------------------------|
| MSH          | Message Header         |
| EVN          | Event Type             |
| PID          | Patient Identification |
| [PV1]        | Visit Segment          |

Inbound message:

- All available active insurances (primary, secondary, and tertiary) of the patient are deleted

### Sample Message

```
MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-
0400||BAR^P06|108|P|2.3.1|||||UNICODE UTF-8||
EVN|P06|20101223202939-0400||||
PID||P12345^^^ISSUER|P12345^^^ISSUER||PATIENT^TEST^M^^^^||19741018|M||2131 -1|10808 FOOTHILL BLVD^^RANCHO
CUCAMONGA^CA^91730^US||(909)481 -5872^^^qa@ramsoft.com|(909)481 -5800x1||M||12345|286-50-9510||2135-2|
```

## 5.13 Detailed Financial Transaction

The Detailed Financial Transaction message (DFT^P03) allows RMC to send charge information to billing software (Charge Processor). This is normally triggered by clicking the Post Charge button in RamSoft software. It also allows RMC receive charge information to update patient balance information and other information (referring / reading doctor, study, study procedures).

| Segment Name | Segment Description              |
|--------------|----------------------------------|
| MSH          | Message Header                   |
| EVN          | Event Type                       |
| PID          | Patient Identification           |
| [PV1]        | Patient Visit Information        |
| {FT1}        | Financial Transaction            |
| [{PR1}]      | Procedure                        |
| [GT1]        | Guarantor                        |
| {[IN1]}      | Insurance                        |
| [ACC]        | Accident and workman information |

RamSoft Extension: We have a parameter in the outbound channel configuration that allows GT1 and IN1 segments to be sent with the DFT^P03 message. The IHE standard requires these segments to be sent only in BAR messages.

### 5.13.1 Inbound Processing

1. We use the following algorithm to update the patient balance information
  - a) We locate the patient record based on Patient ID and Issuer of Patient ID as described in the PID segment. If no match is found, then we create a new patient.
  - b) In PV1 segment, we read PV1.46 as Patient Balance.
  - c) Patient ID and Patient Balance are required fields. If PatientID or Patient Balance is empty the HL7 message will be rejected.
  - d) The patient balance field is updated with Patient Balance according to Patient ID
2. Insurance segments are ignored inbound.
3. We use the following algorithm to update other information from FT1 segments: We read FT1.23 as Accession Number. If FT1.23 has value, we process updating following information:
  - a) Locate Study according to Accession Number. If found, perform update this. Otherwise, the study is not inserted, and the patient demographics will only be updated.
  - b) To update referring / reading doctor, we read FT1.20 as Reading Doctor information. If FT1.20 is empty, we read from PV1 segment (PV1.8, PV1.7) and FT1.21 as Referring Physician information.
  - c) To update study info, we read FT1.16 as Patient Location and if blank we will read from PV1.3.
  - d) To update study procedures, for each FT1 segment, we read FT1.25 as Procedure Code, FT1.26 Procedure Code Modifier, FT1.19 as Diagnosis Code, FT1.10 as Quantity.
  - e) Update HL7BILLED field to "Y" according to this study.

### 5.13.2 Outbound Processing

We populate ACC segment according to active insurances which have extra insurance information:  
If patient has Primary, Secondary and Tertiary active insurances the order of ACC segments is following:  
ACC segment #1 – Primary Insurance.  
ACC segment #2 – Secondary Insurance  
ACC segment #3 – Tertiary Insurance.

If patient has Secondary and Tertiary active insurances the order of ACC segments is following:  
ACC segment #1 – Secondary Insurance  
ACC segment #2 – Tertiary Insurance.

If patient has Primary and Tertiary active insurances the order of ACC segments is following:  
ACC segment #1 – Primary Insurance  
ACC segment #2 – Tertiary Insurance.

If patient has only one type of active insurance this insurance will be sent in first ACC segment.

When interfacing with other vendor, we send only one ACC segment as following:

- Send ACC segment of Primary Insurance
- Send ACC segment of Secondary Insurance if there are no ACC segment of Primary Insurance
- Send ACC segment of Tertiary Insurance if there are no ACC segments of Primary Insurance and no ACC segment of Secondary Insurance.

### Sample Messages

Inbound Message:

```
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20150421141041+0700||DFT^P03|251|P|2.3.1|||||UNICODE UTF-8||EVN|P03|20150421141041+0700||||PID|1|TEST1^^^RAMS OFT^MR|TEST 1^^^RAMSOFT^MR||PATIENT1^GCS ^ICT^^|^||U||UNK^DECLINED^HL70005|^^^^^US|^^^^^^|^^^^^^|UNK|S|||||UNK^DECLINED^HL70189|PV1|1|O| ^^^^^^^|HIEU^NGUYEN^^^| ^HIEU^NGUYEN^^^|RAM13|25300|V|FT1|1|626.1|20150415164034+0700|20150421141041+0700|CG|626.1|HELLO WORLD||1|0|0|SE|PVL1^PHAT^LUONG^^^| ^HIEU^NGUYEN^^^|TESTSTUDY1||TESTPCODE^CUSTOM^CPT-4|FT1|2|626.2|20150415164034+0700|20150421141041+0700|CG|626.2|HELLO WORLD||20|0|0|SE|PVL1^PHAT^LUONG^^^| ^HIEU^NGUYEN^^^|TESTSTUDY1||A9698^INJECT NON -RADIOACTIVE CONTRAST PER STUDY^CPT-4|
```

Outbound Message:

```
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20150421141041+0700||DFT^P03|251|P|2.3.1|||||UNICODE UTF-8||EVN|P03|20150421141041+0700||||PID|1|TEST1^^^RAMS OFT^MR|TEST 1^^^RAMSOFT^MR||PATIENT1^GCS ^ICT^^|^||U||UNK^DECLINED^HL70005|^^^^^US|^^^^^^|^^^^^^|UNK|S|||||UNK^DECLINED^HL70189|PV1|1|O| ^^^^^^^|HIEU^NGUYEN^^^| ^HIEU^NGUYEN^^^|RAM13|25300|V|FT1|1|626.1|20150415164034+0700|20150421141041+0700|CG|626.1|HELLO WORLD||1|0|0|SE|PVL1^PHAT^LUONG^^^| ^HIEU^NGUYEN^^^|TESTSTUDY1||TESTPCODE^CUSTOM^CPT -4|FT1|2|626.2|20150415164034+0700|20150421141041+0700|CG|626.2|HELLO WORLD||20|0|0|SE|PVL1^PHAT^LUONG^^^| ^HIEU^NGUYEN^^^|TESTSTUDY1||A9698^INJECT NON -RADIOACTIVE CONTRAST PER STUDY^CPT-4|GT1|1|PATIENT1^GCS^ICT^^|^^^^^US|U||SEL|||||^^^^^|Oth|||||
```

## 5.14 Vaccination

The Vaccination update message (VXU^V04) allows RMC to send vaccination information to immunization registries.

| Segment Name | Segment Description     |
|--------------|-------------------------|
| MSH          | Message Header          |
| PID          | Patient Identification  |
| PD1          | Patient Demographics    |
| RXA          | Vaccination             |
| NK1          | Next of Kin (Guarantor) |

### Sample Message

```
MSH|^~\&|RAMSOFT|X68||RAMSOFT|20160518145101+0700||VXU^V04^VXU_V04|317928|P|2.5.1|||AL|ERPID|1||411285^^^HOSPITAL SULTAN ISMAIL^MR~991-20-6016688^^^MAA^SS||TEST PATIENT RP MERGE^TEST^TEST NE JR
MS.^^^^L|^|19991206|F|||31 JALAN MUTIARA,TAMAN MUTIARA, 8 JALAN RUBY^^JOHOR
BAHRU^^81100^MYS^L|^PRN^PH^^011^7654321~^^^^^^|S||20160000096|||NK1|1|TESTING
GUARS^^^^^^L|MTH^OTHER^HL70063|68 TEST ST,TAMAN MUTIARA^^JOHOR
BAHRU^^81100^MYS^L|^PRN^PH^^011^7654321ORC|RE||172587^HOSPITAL SULTAN
ISMAIL|||||||RXA|0|1|20160518||22^DTP-Haemophilus influenzae type b conjugate vaccine^CVX|200|^UCUM|||^^^|||||||
```

## 5.15 Appointment Query

The Appointment Query message (SQM^S25) gives vendors the ability to query for scheduling information through two modes. SSA queries provide available appointment slots for a study type at a specific facility, and SBK queries provide booked appointments and blocked times for a specified resource. Information is returned in an SQR^S25 response.

| Segment Name | Segment Description     |
|--------------|-------------------------|
| MSH          | Message Header          |
| QRD          | Query Definition        |
| QRF          | Query Filter            |
| APR          | Appointment Preferences |

### 5.15.1.1 Inbound Processing

QRD.9.1 selects the mode. The two return different segment sets.

#### SSA – available appointment slots

Finds bookable slots for a study type at a facility, by walking each matching resource's working hours and subtracting booked appointments and blocked times.

| Behavior       | Value                                                                                            |
|----------------|--------------------------------------------------------------------------------------------------|
| Required       | QRD.10 study type, QRF.1 facility                                                                |
| Window default | Now -> now + 7 days                                                                              |
| Window cap     | 7 days. A wider request is clamped, and the server logs request limit exceeded – using 7 instead |

|                    |                                                                                       |
|--------------------|---------------------------------------------------------------------------------------|
| Slots per resource | 100 when no end date is given                                                         |
| Slot length        | The study type's DURATION, falling back to the resource's DEFAULTSTUDYORDERDURATION   |
| Resources searched | All with CLASSNAME = the study type's modality, TYPENAME = MODALITY, at that facility |

Returns one SCH + RGS = AIL group per slot, ordered by start time.

#### SBK – blocked times and booked appointments

Returns what is "unavailable" for one named resource.

| Behavior            | Value                                                                   |
|---------------------|-------------------------------------------------------------------------|
| Required            | QRF.1 facility, APR.2 resource                                          |
| Window default      | Now -> now + 5 days                                                     |
| Window cap          | None                                                                    |
| Blocked times       | APPOINTMENTSTATE = 5, returned as AIS segments                          |
| Booked appointments | APPOINTMENTSTATE <> 5, returned as AIL segments                         |
| Recurrence          | Daily / weekly / monthly / yearly / non-recurring, expanded into AIS.12 |

Returns a single SCH + RGS pair, then one AIS per blocked time and one AIL per appointment.

#### 5.15.2 QRD

The QRD segment is used to define a query.

| Seq | Length            | Data Type | Outbound | Description               | Component                                                                                                                                             |
|-----|-------------------|-----------|----------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 26                | TS        | O        | Query date/time           |                                                                                                                                                       |
| 2   | 1                 | ID        | R        | Query Format Code         | "R" – Response is in record-oriented format                                                                                                           |
| 3   | 1                 | ID        | R        | Query Priority            | "I" – Immediate                                                                                                                                       |
| 4   | 64                | ST        | O        | Query ID                  |                                                                                                                                                       |
| 9   | 3                 | CE        | R        | Query Filter              | "SBK" – Booked slots on the identified schedule<br>"SSA" – Time slots available for a single appointment<br>- We return both booked and blocked slots |
| 10  | 1 – 64<br>2 – 250 | CE        | C        | What Department Data Code | 1 – Study Type Code<br>2 – Study Description<br>- The Study Type Code is required if using the "SSA" query filter                                     |

### 5.15.3 QRF

The QRF segment is used with the QRD segment to further refine the content of a query.

| Seq | Length | Data Type | Outbound | Description                      | Component                                                                                                                                                                                                                                           |
|-----|--------|-----------|----------|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 64     | ST        | R        | Where Subject Filter             | Imaging Facility / Institution Name                                                                                                                                                                                                                 |
| 9   | 26     | TQ        | O        | When Quantity / Timing Qualifier | 4 – The start date/time for the query date range<br>5 – The end date/time for the query date range.<br>- If the start date/time is empty, we use the current date/time<br>- If the end date/time is empty, we add 5 days from the current date/time |

### 5.15.4 APR

The APR segment contains parameters and preference specifications used for requesting appointments in the SRM message.

| Seq | Length | Data Type | Outbound | Description                 | Component                                                                                                                                   |
|-----|--------|-----------|----------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 2   | 64     | PL        | C        | Resource Selection Criteria | Resource Name (must exist under Resources on the corresponding facility)<br>- The resource name is required if using the "SBK" query filter |

### 5.15.5 Response

Segment Order

```
MSH
MSA
[ERR]          only on AE / AR
QAK
[ SCH RGS AIL ]...  SSA – one group per slot
[ SCH RGS AIS... AIL... ]  SBK – one SCH/RGS, then blocked times, then appointments
```

SQR^S25 carries QAK and does not echo QRD / QRF.

### 5.15.6 MSA / ERR / QAK

The QAK segment contains information sent with responses to a query.

| Outcome                    | MSA.1 | MSA.3           | ERR                   | QAK.2 |
|----------------------------|-------|-----------------|-----------------------|-------|
| Slots or records found     | AA    | Successful text | -                     | OK    |
| Query ran, nothing matched | AA    | Successful text | ERR absent            | NF    |
| Rejected – bad request     | AR    | *empty*         | ERR.1 = code + reason | AR    |
| Error – processing failed  | AE    | *empty*         | ERR.1 = code + reason | AE    |

MSA.2 is the inbound MSH.10. QAK.1 is the inbound QRD.4. When an ERR segment is present the reason lives there and MSA.3 is deliberately left empty.

### 5.15.7 SCH

The SCH segment contains general information about the scheduled appointment.

| Seq | Length | Data Type | Outbound | Description                 | Component                                                                                                                                                                                                                                          |
|-----|--------|-----------|----------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4      | SI        | R        | Set ID – SCH                | Sequential number                                                                                                                                                                                                                                  |
| 6   | 250    | CE        | R        | Event Reason                | "Resource Schedule Query"                                                                                                                                                                                                                          |
| 11  | 26     | TQ        | R        | Appointment Timing Quantity | 4 – Resource start date/time in "yyyyMMddHHmmss" format<br>5 – Resource end date/time in "yyyyMMddHHmmss" format<br>7 – Resource start date/time in "yyyy-MM-dd hh:mm:ss a" format<br>8 – Resource end date/time in "yyyy-MM-dd hh:mm:ss a" format |
| 19  | 4 – 64 | PL        | R        | Filler Contact Location     | Imaging Facility / Institution Name                                                                                                                                                                                                                |

### 5.15.8 RGS

The RGS segment is used to identify the resource for a scheduled event.

| Seq | Length | Data Type | Outbound | Description   | Component                                                               |
|-----|--------|-----------|----------|---------------|-------------------------------------------------------------------------|
| 1   | 4      | SI        | R        | Set ID – RGS  | Sequential number                                                       |
| 3   | 64     | CE        | R        | Resource Name | Name of the resource as it appears on the imaging facility's scheduler. |

### 5.15.9 AIS – blocked time (SBK only)

The AIS segment contains details of the blocked event.

| Seq | Length | Data Type | Outbound | Description             | Component                                                                                                                                                                                                                                                        |
|-----|--------|-----------|----------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4      | SI        | R        | Set ID – AIS            | Sequential number                                                                                                                                                                                                                                                |
| 4   | 26     | TS        | R        | Blocked Start Date/Time | 1 – Blocked start date/time in "yyyyMMddHHmmss[+/-ZZZZ]" format<br>2 – Blocked end date/time in "yyyyMMddHHmmss[+/-ZZZZ]" format<br>4 – Blocked start date/time in "yyyy-MM-dd hh:mm:ss a" format<br>5 – Blocked end date/time in "yyyy-MM-dd hh:mm:ss a" Format |

|    |                              |    |   |                                         |                                                                                                                                                                                                                                                              |
|----|------------------------------|----|---|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5  | 20                           | NM | R | Start Date/Time Offset                  | Blocked date/time offset based on server's time zone                                                                                                                                                                                                         |
| 6  | 200                          | CE | R | Start Date/Time Offset Units            | Default is "min"                                                                                                                                                                                                                                             |
| 7  | 20                           | NM | R | Duration                                | Duration of the blocked time                                                                                                                                                                                                                                 |
| 8  | 250                          | CE | R | Duration Units                          | Default is "min"                                                                                                                                                                                                                                             |
| 10 | 1 – 1<br>2 – 64              | ST | R | Filler Status Code                      | 1 – Specifies whether the blocked time is recurring, "Y" or "N"<br>2 – Reason for the blocked time                                                                                                                                                           |
| 12 | 1 – 32<br>2 – 250<br>3 – 250 | CE | R | Filler Supplemental Service Information | 1 – Blocked time pattern<br>2 – Days that the blocked time applies. If weekly, then specifies the day(s) of the week, otherwise specifies the calendar day.<br>3 – Specifies the recurrence type, "DAILY", "WEEKLY", "MONTHLY", "YEARLY", or "NON-RECURRING" |

#### 5.15.10 AIL – location/appointment slot (SSA only)

The AIL segment contains details of the booked appointment.

| Seq | Length | Data Type | Outbound | Description                  | Component                                                                                                                                                                                                                                                                                                    |
|-----|--------|-----------|----------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4      | SI        | R        | Set ID – AIL                 | Sequential number                                                                                                                                                                                                                                                                                            |
| 4   | 26     | TS        | C        | Available Start Date/Time    | 1 – Available appointment start date/time in "yyyy-MM-dd hh:mm:ss a" format                                                                                                                                                                                                                                  |
| 6   | 26     | TS        | C        | Booked Start Date/Time       | 1 – Booked appointment start date/time in "yyyyMMddHHmmss[+/-ZZZZ]" format<br>2 – Booked appointment end date/time in "yyyyMMddHHmmss[+/-ZZZZ]" format<br>4 – Booked appointment start date/time in "yyyy-MM-dd hh:mm:ss a" format<br>5 – Booked appointment end date/time in "yyyy-MM-dd hh:mm:ss a" format |
| 7   | 20     | NM        | R        | Start Date/Time Offset       | Date/time offset based on server's time zone.                                                                                                                                                                                                                                                                |
| 8   | 200    | CE        | R        | Start Date/Time Offset Units | Default is "min"                                                                                                                                                                                                                                                                                             |
| 9   | 20     | NM        | R        | Duration                     | Duration of the appointment                                                                                                                                                                                                                                                                                  |
| 10  | 250    | CE        | R        | Duration Units               | Default is "min"                                                                                                                                                                                                                                                                                             |

#### 5.15.11 Rejections and Errors

All of these come back as MSA.1 = AR with the reason in ERR.1

| ERR.1 Reason                                            | Cause                                                |
|---------------------------------------------------------|------------------------------------------------------|
| Unsupported query definition in QRD.2/QRD.3: <fc>/<pri> | QRD.2 does not equal "R" or QRD.3 does not equal "I" |
| Unknown query filter in QRD.9: <value>                  | QRD.9.1 is not SSA or SBK                            |
| Study type – QRD.10                                     | SSA with no study type code                          |

|                                 |                                          |
|---------------------------------|------------------------------------------|
| Facility – QRF.1                | Facility is missing                      |
| Resource – APR.2                | SBK with no resource                     |
| Facility not found!             | QRF.1 does not match any FACILITIES row  |
| Resource or facility not found! | APR.2 + QRF.1 combination does not exist |

MSA.1 – AE is returned for processing failures – database unavailable, a query error, or an unhandled exception. The reason text is whatever the exception carried.

### 5.15.12 Examples

#### SSA request

```
MSH|^~\&|HIS|SENDING FACILITY|RAMSOFT|RECEIVING
FACILITY|201003060953||SQM^S25|20100306953450|P|2.3.1
QRD|20220802124421|R|I|123|||1234567890^SMITH^JOHN^MD^|SSA|70100^XRAY JAW < 4 VIEWS
QRF|FACILITY||| |||^20221222000000^20221226000000
APR|MON^OK|RESOURCE|DEPARTMENT||
```

#### Successful response shape

```
MSH|^~\&|RAMSOFT|RECEIVING FACILITY|HIS|SENDING
FACILITY|201003060953||SQR^S25|20100306953450|P|2.3.1
MSA|AA|20100306953450|Request was Successfully processed
QAK|123|OK
SCH|1|||^Resource Schedule Query|...
RGS|1||ROOM 1
AIL|1||2022-12-22 09:00:00 AM| -240|min|15|min
...
```

#### Nothing available

```
MSA|AA|20100306953450|Request was Successfully processed
QAK|123|NF
```

#### Rejected

```
MSA|AR|20100306953450|
ERR|<code>^Unknown query filter in QRD.9: XYZ
QAK|123|AR
```

## 5.16 Patient Demographic Query

The Patient Demographic Query message (QRY^A19) gives vendors the ability to query for patient demographics. The query is used to retrieve the patient ID and patient identity details on demand. Information is returned in an ADR^A19 response.

| Segment Name | Segment Description |
|--------------|---------------------|
| MSH          | Message Header      |
| QRD          | Query Definition    |
| QRF          | Query Filter        |

### 5.16.1.1 Inbound Processing

QRD.8 specifies the patient's name. QRF.5 specifies the date of birth.

#### Search Behavior

The family name is mandatory; given name and date of birth are optional narrowing keys. The combination supplied selects one of four parameterized queries against the PATIENTMODULE table.

Matching is exact – no wildcards, no partial or phonetic matching, and case sensitivity follows the database collation. Every returned column passes through a null-coalescing helper, so a NULL in the database becomes an empty HL7 field rather than the literal text null.

#### Result Limiting

Two different numbers are involved, and they can disagree:

|                   | Meaning                                     |
|-------------------|---------------------------------------------|
| PID segment count | Capped at QRD.7.1, or 50 by default         |
| ZDS.2.1           | The total number of matching rows, uncapped |

A search matching 120 patients with QRD.7.1 = 10 therefore returns 10 PID segments and ZDS|TOTAL\_MATCHES|120. Use ZDS.2.1 to detect that the result set was truncated and that the query needs narrowing.

### 5.16.2 QRD

The QRD segment is used to define a query.

| Seq | Length | Data Type | Outbound | Description              | Component                                                                                     |
|-----|--------|-----------|----------|--------------------------|-----------------------------------------------------------------------------------------------|
| 1   | 26     | TS        | O        | Query date/time          |                                                                                               |
| 2   | 1      | ID        | R        | Query Format Code        | "R" – Response is in record-oriented format                                                   |
| 3   | 1      | ID        | R        | Query Priority           | "I" – Immediate                                                                               |
| 4   | 64     | ST        | O        | Query ID                 |                                                                                               |
| 7   | 10     | CQ        | O        | Quantity Limited Request | Max PID segments returned.<br><b>Defaults to 50 when absent.</b>                              |
| 8   | 64     | XCN       | R        | Who Subject Filter       | 1 – ID (currently ignored)<br>2 – Family Name (required)<br>3 – Given Name<br>4 – Middle Name |
| 9   | 3      | CE        | R        | Query Filter             | "DEM" – Demographics                                                                          |

QRD.2 and QRD.3 are case-sensitive and fixed – R/I is the only combination this interface services. Anything else is rejected before the filter value is read.

### 5.16.3 QRF

The QRF segment is used with the QRD segment to further refine the content of a query.

| Seq | Length | Data Type | Outbound | Description              | Component                           |
|-----|--------|-----------|----------|--------------------------|-------------------------------------|
| 1   | 64     | ST        | O        | Where Subject Filter     | Imaging Facility / Institution Name |
| 5   | 26     | ST        | O        | Other QRY Subject Filter | Date of Birth                       |

### 5.16.4 Response

Segment Order

```
MSH
MSA
[ERR]      only on AE / AR
QRD        echoed from the request
QRF        echoed from the request
[PID]...   one per matched patient, up to the quantity limit
ZDS        total match count
```

ADR^A19 echoes QRD and QRF and carries no QAK segment. Note that the echoed QRD/QRF precede the PID segments.

### 5.16.5 MSA / ERR

| Outcome                      | MSA.1 | MSA.3           | ERR                   | PID / ZDS |
|------------------------------|-------|-----------------|-----------------------|-----------|
| One or more patients matched | AA    | Successful text | -                     | Present   |
| No patient matched           | AA    | Successful text | -                     | Absent    |
| Rejected – bad request       | AR    | *empty*         | ERR.1 = code + reason | Absent    |
| Error – processing failed    | AE    | *empty*         | ERR.1 = code + reason | Absent    |

MSA.2 is the inbound MSH.10. When an ERR segment is present the reason lives there and MSA.3 is deliberately left empty.

The matched and no-match responses are identical apart from the presence of PID / ZDS. Because ADR^A19 drop QAK, there is no QAK.2 = NF to signal an empty result – a receiver must treat "AA with no PID" as "no patient found".

### 5.16.6 PID

| Field   | Source Column     | Notes                        |
|---------|-------------------|------------------------------|
| PID.1.1 | -                 | Set ID, 1-based              |
| PID.3.1 | PATIENTID         | Patient identifier           |
| PID.3.4 | ISSUEROFPATIENTID | Assigning authority          |
| PID.5.1 | FAMILYNAME        |                              |
| PID.5.2 | GIVENNAME         |                              |
| PID.5.3 | MIDDLENAME        |                              |
| PID.7.1 | BIRTHDATE         | Converted to HL7 date format |
| PID.8.1 | SEX               | Passed through as stored     |

### 5.16.7 ZDS

| Field   | Content                                        |
|---------|------------------------------------------------|
| ZDS.1.1 | Literal TOTAL_MATCHES                          |
| ZDS.2.1 | Total matching rows, before the quantity limit |

ZDS is a Z-segment: locally defined, not part of the HL7 Standard. A receiver that validates strictly against the published ADR^A19 structure must be configured to tolerate it.

### 5.16.8 Rejections and Errors

All of these come back as MSA.1 = AR with the reason in ERR.1

| MSA.1 | ERR.1 Reason                                            | Cause                                                      |
|-------|---------------------------------------------------------|------------------------------------------------------------|
| AR    | Unsupported query definition in QRD.2/QRD.3: <fc>/<pri> | QRD.2 does not equal "R" or QRD.3 does not equal "I"       |
| AR    | Unknown query filter in QRD.9: <value>                  | QRD.9.1 is not DEM                                         |
| AR    | Patient Family Name – QRD.8.2                           | No family name supplied                                    |
| AE    | Exception text                                          | Database unavailable, query failure, or an unhandled error |

A malformed QRF.5.1 is not tolerated – the date conversion throws, which puts the destination in ERROR and returns an AE.

## 5.16.9 Examples

### Request

```
MSH|^~\&|VENDOR|CLIENT|ADT|HOSPITAL|202607230915||QRY^A19|123456|P|2.3.1
QRD|202607230915|R|I|123456||10^RD|^DEMO^TAMMY|DEM|
QRF|HOSPITAL|||19440109
```

### One Match

```
MSH|^~\&|ADT|HOSPITAL|VENDOR|CLIENT|202607230915||ADR^A19|123456|P|2.3.1
MSA|AA|123456|Request was Successfully processed
QRD|202607230915|R|I|123456||10^RD|^DEMO^TAMMY|DEM|
QRF|HOSPITAL|||19440109
PID|1||ID990034^^^RAMSOFT||DEMO^TAMMY^||19440109|F
ZDS|TOTAL_MATCHES|1
```

### No Match

```
MSH|^~\&|ADT|HOSPITAL|VENDOR|CLIENT|202607230915||ADR^A19|123456|P|2.3.1
MSA|AA|123456|Request was Successfully processed
QRD|202607230915|R|I|123456||10^RD|^DEMO^TAMMY|DEM|
QRF|HOSPITAL|||19440109
PID|1||ID990034^^^RAMSOFT||DEMO^TAMMY^||19440109|F
ZDS|TOTAL_MATCHES|1
```

No PID, no ZDS, and the MSA is indistinguishable from a successful lookup.

### Rejected – no family name

```
MSA|AR|123456|
ERR|<code>^Patient Family Name - QRD.8.2
QRD|202607230915|R|I|123456||10^RD|^DEMO^TAMMY|DEM|
QRF|HOSPITAL|||19440109
```

### Truncated result set

```
MSA|AA|123456|Request was Successfully processed
...
PID|1||...
PID|2||...
...up to QRD.7.1 segments...
ZDS|TOTAL_MATCHES|120
```

## 6 SEGMENT DEFINITIONS

The following section contains a detailed listing of all segment types used by the RMC for constructing HL7 messages. The sequence number is specified in the left most columns and the component contents are enumerated in the right column. Some components contain even more subcomponents. In these cases, the table cell is split into two columns, the left side indicating the components, the right indicating the sub-components. In HL7, subcomponents are separated using & characters.

|component1^subcomponent1&subcomponent2&subcomponent3^component3|

**An example of a sequence that contains 3 components with the second component containing 3 subcomponents.**

The Inbound and Outbound columns specify which fields are mandatory and which are optional. Mandatory fields are marked by an "R" for "Required", conditional fields are marked by a "C" and non-mandatory ones are marked with "O" for "Optional". Mandatory fields are only required to be present if the sequence they belong to is in the message.

## 6.1 MSH

The MSH segment stores message control information. This includes the message type, a unique message identifier, etc.

| Seq. | Length         | Data Type | Inbound | Description           | Component                                                                                                                                                                                                                                                               |
|------|----------------|-----------|---------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | 1              | ST        | R       | Field Separators      | Field Separators " "                                                                                                                                                                                                                                                    |
| 2    | 4              | ST        | R       | Encoding Characters   | Encoding Characters "^~\&"                                                                                                                                                                                                                                              |
| 3    |                | HD        | R       | Sending Application   | <b>Outbound:</b> Configurable                                                                                                                                                                                                                                           |
| 4    |                | HD        | R       | Sending Facility      | <b>Inbound:</b> Updates referring physician assigned facility if <i>OBR-16.14</i> , <i>ORC-12.14</i> , <i>PV1-8.14</i> , <i>PV1-7.14</i> , <i>ORC-17</i> , and <i>ORC-13</i> are blank and facility is setup as a "Referring Facility"<br><b>Outbound:</b> Configurable |
| 5    |                | HD        | O       | Receiving Application | <b>Outbound:</b> Configurable                                                                                                                                                                                                                                           |
| 6    |                | HD        | O       | Receiving Facility    | <b>Outbound:</b> Configurable                                                                                                                                                                                                                                           |
| 7    |                | TS        | O       | Date/Time of Message  |                                                                                                                                                                                                                                                                         |
| 9    | 1 – 3<br>2 – 3 | MSG       | R       | Message Identifiers   | 1 – Message Type (e.g. ADT, ORM)<br>2 – Trigger Event (e.g. A08)<br><b>Outbound:</b> Copy <i>MSH-9.2</i> to <i>EVN-1</i>                                                                                                                                                |
| 10   | 10             | ST        | R       | Message Control ID    |                                                                                                                                                                                                                                                                         |
| 11   | 3              | PT        | O       | Processing ID         | <b>Outbound:</b> 'P'                                                                                                                                                                                                                                                    |
| 12   |                | VID       | O       | Version ID            | <b>Outbound:</b> '2.3.1'                                                                                                                                                                                                                                                |
| 18   | 16             | ID        | O       | Character Set         | <b>Outbound:</b> 'UNICODE UTF-8'                                                                                                                                                                                                                                        |

The *MSH-5 field* is used in ACK messages to specify the application that sent the message being acknowledged. RMC does not populate this field.

*MSH-7* is filled out in ACK messages with the time of acknowledgment.

*MSH-9* contains the message type (e.g.: ADT, ORM...) and trigger event (e.g. A08, O01). ACK messages do not have a trigger event.

*MSH-10* stores a unique ID identifying a message. The uniqueness of this ID must last until an ACK has been received for the message containing it.

## 6.2 MSA

The MSA segment is used to store ACK information. The MSA segment is only used in ACK messages.

| Seq | Length | Data Type | Inbound | Description          | Component                                                                                                                                                                                                                                                          |
|-----|--------|-----------|---------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 2      | ID        | R       | Acknowledgement Code | 1 – Acknowledgment Code<br><b>Inbound:</b> We support both original mode and enhanced mode codes:<br>'AA' – Application Accept<br>'AE' – Application Error<br>'AR' – Application Reject<br><br>'CA' – Commit Accept<br>'CE' – Commit Error<br>'CR' – Commit Reject |
| 2   | 20     | ST        | R       | Message Control ID   | 1 – Message Control ID                                                                                                                                                                                                                                             |
| 3   | 80     | ST        | O       | Text Message         | 1 – Optional field describing the condition                                                                                                                                                                                                                        |

The *MSA-1 field* will contain either "AA" if the message containing it is an ACK or "AR" if the message is a NACK.

*MSA-2* contains the *MSH-10* value (message ID) of the message which is being acknowledged.

## 6.3 ERR

The ERR segment is used to store error information. The ERR segment is only used in ACK messages.

| Seq | Length | Data Type | Inbound | Description             | Component |
|-----|--------|-----------|---------|-------------------------|-----------|
| 1   | 80     | ID        | R       | Error code and location |           |

## 6.4 EVN

The EVN segment stores event information.

| Seq | Length | Data Type | Inbound | Description        | Component             |
|-----|--------|-----------|---------|--------------------|-----------------------|
| 1   | 3      | ID        | O       | Event Type Code    | See <i>MSH-9.2</i>    |
| 2   | 26     | TS        | O       | Recorded Date/Time | Current date and time |

## 6.5 PID

The PID segment is used to communicate patient identification information. It is present in all messages supported by the RMC except MFNs.

| Seq | Length                                         | Data Type | Inbound | Description             | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |          |                   |  |
|-----|------------------------------------------------|-----------|---------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------|--|
| 1   | 1                                              | SI        | O       | Set ID - PID            | <b>Outbound:</b> Always set to '1'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |                   |  |
| 2   | 64                                             | CX        | O       | Patient ID              | <b>Outbound:</b> See <i>PID-3</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |                   |  |
| 3   | 1 - 64<br>4 - 64                               | CX        | R       | Patient Identifier List | 1 – Patient ID ( <i>0010,0020</i> )<br><b>Inbound:</b> We read <i>PID-3.1</i><br><b>Outbound:</b> We copy to <i>PID-3.1, PID-2.1</i><br><br>4 – Issuer Of Patient ID ( <i>0010,0021</i> )<br><b>Inbound:</b> We read <i>PID-3.4, MSH-4.1</i> , if blank, then we set to a configurable value.<br><b>Outbound:</b> We copy to <i>PID-2.4</i><br><br><b>Outbound:</b> 5 – Identifier Type Code 'MR'<br><br><b>Inbound:</b> If repeated fields are received, the first field is parsed, and the rest are ignored.<br>Note: Patient ID is required Field.<br>If no value is present, HL7 message will be rejected. |          |                   |  |
| 5   | 1 - 64<br>2 - 64<br>3 - 64<br>4 - 64<br>5 - 64 | XPN       | R       | Patient Name            | 1 – Family Name ( <i>0010,0010</i> )<br>2 – Given Name ( <i>0010,0010</i> )<br>3 – Middle Name ( <i>0010,0010</i> )<br>4 – Suffix ( <i>0010,0010</i> )<br>5 – Prefix ( <i>0010,0010</i> )<br><b>Inbound:</b> based on the system config "Allow Case Sensitive Person Name" value<br>- If it is false, stored with upper case<br>- Otherwise, stored as original values                                                                                                                                                                                                                                         |          |                   |  |
| 6   | 1 - 64<br>2 - 64                               | CX        | O       | Mother's Maiden Name    | 1 – Family Name<br>2 – Given Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |                   |  |
| 7   | 26                                             | TS        | O       | Date / Time of Birth    | Date of Birth ( <i>0010,0030</i> )<br>Time is not stored in our system                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |          |                   |  |
| 8   | 1                                              | IS        | O       | Sex                     | Sex ( <i>0010,0040</i> )<br>'F' – 'FEMALE'<br>'M' – 'MALE'<br>'O' – 'OTHER'<br>'U' – NULL<br><b>Inbound:</b><br>- For a new patient, we translate all other values to 'OTHER'<br>- For an existing patient, we ignore to update for all other values                                                                                                                                                                                                                                                                                                                                                           |          |                   |  |
| 10  | 1 – 16<br>2 – 64                               | CE        | O       | Race                    | 1 – Identifier                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2 – Text | 3 – Coding System |  |

| Seq | Length                     | Data Type | Inbound | Description            | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                |                                               |         |  |   |
|-----|----------------------------|-----------|---------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------|--|---|
|     | 3 - 64                     |           |         |                        | 1002-5                                                                                                                                                                                                                                                                                                                                               | AMERICAN INDIAN OR ALASKA NATIVE              | HL70005 |  |   |
|     |                            |           |         |                        | 2028-9                                                                                                                                                                                                                                                                                                                                               | ASIAN                                         | HL70005 |  |   |
|     |                            |           |         |                        | 2054-5                                                                                                                                                                                                                                                                                                                                               | BLACK OR AFRICAN AMERICAN                     | HL70005 |  |   |
|     |                            |           |         |                        | 2076-8                                                                                                                                                                                                                                                                                                                                               | NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER     | HL70005 |  |   |
|     |                            |           |         |                        | 2106-3                                                                                                                                                                                                                                                                                                                                               | WHITE                                         | HL70005 |  |   |
|     |                            |           |         |                        | 2131-1                                                                                                                                                                                                                                                                                                                                               | OTHER                                         | HL70005 |  |   |
|     |                            |           |         |                        | UNK                                                                                                                                                                                                                                                                                                                                                  | DECLINED                                      | HL70005 |  |   |
|     |                            |           |         |                        | <b>Inbound:</b><br>- For a new patient, we translate all other values to 'UNK'<br>- For an existing patient, we ignore to update for all other values                                                                                                                                                                                                |                                               |         |  |   |
|     |                            |           |         |                        | 11                                                                                                                                                                                                                                                                                                                                                   | 1 - 256<br>3 - 24<br>4 - 3<br>5 - 10<br>6 - 2 | XAD     |  | O |
| 13  | 1 - 64<br>4 - 64<br>7 - 64 | XTN       | O       | Home Phone             | 1 - Phone Number (0010,2154)<br>4 - Email Address<br>7 - Cell Phone Number                                                                                                                                                                                                                                                                           |                                               |         |  |   |
| 14  | 1 - 64<br>7 - 64           | XTN       | O       | Business Phone         | 1 - Phone Number (0010,2154)<br>7 - Fax Number                                                                                                                                                                                                                                                                                                       |                                               |         |  |   |
| 15  | 16                         | CE        | O       | Language               | Language (0010,0101)                                                                                                                                                                                                                                                                                                                                 |                                               |         |  |   |
| 16  | 1                          | CE        | O       | Marital Status         | 'M' - 'MARRIED'<br>'S' - 'SINGLE'<br>'D' - 'DIVORCED'<br>'W' - 'WIDOWED'<br>'A' - 'LEG. SEP.'<br>'U' - 'UNKNOWN'<br>'O' - 'OTHER'<br><b>Inbound:</b><br>We are translating empty value to 'UNKNOWN'<br>We translate all other values to 'OTHER'<br><b>Outbound:</b><br>We are translating empty value to 'U'<br>We translate all other values to 'O' |                                               |         |  |   |
| 18  | 1 - 16                     | CX        | O       | Patient Account Number | 1 - Account Number (0010, 0050)                                                                                                                                                                                                                                                                                                                      |                                               |         |  |   |
| 19  | 1 - 16                     | ST        | O       | SSN                    | 1 - SSN / Alternate Patient ID (0010,1000)                                                                                                                                                                                                                                                                                                           |                                               |         |  |   |

| Seq | Length                     | Data Type | Inbound | Description | Component, Database and DICOM Mapping                                                                                                                 |                        |                   |  |
|-----|----------------------------|-----------|---------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------|--|
| 22  | 1 - 16<br>2 - 64<br>3 - 64 | CE        | O       | Ethnicity   | 1 - Identifier                                                                                                                                        | 2 - Text               | 3 - Coding System |  |
|     |                            |           |         |             | 2135-2                                                                                                                                                | HISPANIC OR LATINO     | HL70189           |  |
|     |                            |           |         |             | 2186-5                                                                                                                                                | NOT HISPANIC OR LATINO | HL70189           |  |
|     |                            |           |         |             | UNK                                                                                                                                                   | DECLINED               | HL70189           |  |
|     |                            |           |         |             | <b>Inbound:</b><br>- For a new patient, we translate all other values to 'UNK'<br>- For an existing patient, we ignore to update for all other values |                        |                   |  |

## 6.6 PV1

The PV1 segment communicates patient visit information, so it is not needed in any of the ADT messages which only deal with patient identification information.

| Seq | Length                                         | Data Type | Inbound | Description               | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                |
|-----|------------------------------------------------|-----------|---------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2   | 1                                              | IS        | O       | Patient Class             | Patient Class.<br>The following values from Table 4 of Health Level Seven Version 2.3.1 are supported for <b>Inbound / Outbound:</b><br>'E' - Emergency<br>'I' - Inpatient<br>'O' - Outpatient<br>'P' - Preadmit<br>'R' - Recurring Patient<br>'B' - Obstetrics<br>If value is not defined, value is set to 'O' for both directions. |
| 3   | 1 - 64<br>2 - 64<br>4 - 64<br>6 - 16<br>9 - 64 | PL        | O       | Assigned Patient Location | 1 - Department (must exist under Locations on the corresponding facility)<br>2 - Room (must exist under Locations on the corresponding facility)<br>4 - Imaging Facility / Institution Name (0008, 0080)<br>6 - Patient's Location Code (not displayed or editable in our system)<br>9 - Patient's Location (0038, 0300)             |
| 7   | 60                                             | XCN       | O       | Attending Physician       | See <i>OBR-16</i>                                                                                                                                                                                                                                                                                                                    |
| 8   | 60                                             | XCN       | O       | Referring Physician       | See <i>OBR-16</i>                                                                                                                                                                                                                                                                                                                    |
| 9   | 1 - 16<br>2 - 64<br>3 - 64<br>4 - 64<br>5 - 64 | XCN       | O       | Consulting Doctors        | 1 - ID Number<br><b>Inbound:</b> Updates Physician's NPI only if both Imaging Facility and Physician are registered in our system.<br><b>Outbound:</b> Sends Physician's NPI.                                                                                                                                                        |

|    |                                      |    |   |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----|--------------------------------------|----|---|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | 6 - 64<br>14 - 64<br>with<br>repeats |    |   |                               | 2 – Family Name<br>3 – Given Name<br>4 – Middle Name<br>5 – Suffix<br>6 – Prefix<br>14 – Assigned Facility<br><b>Inbound:</b> Only update Physician's facility if the facility is registered in our system and is associated with the physician<br><b>Outbound:</b> Sends Physician's assigned facility.<br><b>Inbound / Outbound:</b> We can send and receive multiple Consulting Physicians delimited with ~<br>e.g.<br> 12345^SMITH^JOHN^^MD^^^^^^^^^^RAMSOFT<br>~89765^JONES^ED^^MD^^^^^^^^^^ <br><b>Outbound:</b> There is a configured number of how many consulting physicians are sent. See <b>General Configuration Options</b> |
| 15 | 1 - 16                               | IS | O | Ambulatory Status             | 1-Ambulatory Status<br>See Table 9 of Health Level Seven Version 2.3.1 (Ref. 7.1) for details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 19 | 1 - 64                               | CX | O | Visit Number                  | 1-Visit Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 44 | 1 - 26                               | TS | O | Patient's Visit Date/<br>Time | 1-Visit Date/Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 46 | 1 - 9                                | CP | O | Patient Balance               | PV1.46 is only present for Inbound / Outbound DFT messages                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 51 | 1                                    | IS | O | Visit Indicator               | <b>Outbound:</b><br>V – if PV1:19 is present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

**Essential Notes:** In Inbound messages the sequences of PV1 segment as Assigned Patient Location, Attending Physician, Referring Physician, Consulting Doctors can be stored only in study level messages (e.g. ORM, ORU). In Outbound Messages RMC sends in ADT messages simple PV1 segment including only patient class. Note: if ADT messages are setup to send before an ORM or ORU on the same destination, then the study info is available to provide a detailed PV1 segment. In ORM, ORU messages detailed PV1 segment is sent.

## 6.7 AL1

The AL1 segment is used to specify allergies and is repeated for each allergy.

| Seq | Length  | Data Type | Inbound | Description      | Component, Database and DICOM Mapping                                                                           |
|-----|---------|-----------|---------|------------------|-----------------------------------------------------------------------------------------------------------------|
| 1   | 4       | SI        | O       | Set ID – AL1     | <b>Outbound:</b> Auto generated value                                                                           |
| 3   | 2 - 64  | CE        | R       | Allergy Type     | 2 – Allergy Name                                                                                                |
| 4   | 1 - 16  | IS        | O       | Allergy Severity | 1 – Allergy Severity<br>'MI' – Mild<br>'MO' – Moderate<br>'SV' – Severe<br>Other values are displayed as blank. |
| 5   | 1 - 256 | ST        | O       | Allergy Reaction | 1 – Allergy Notes                                                                                               |

## 6.8 MRG

The MRG segment is used to specify a patient that is to be merged into another or whenever the Patient ID or Issuer of Patient ID must be changed.

| Seq | Length           | Data Type | Inbound | Description                   | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                           |
|-----|------------------|-----------|---------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 1 - 64<br>4 - 64 | CX        | C       | Prior Patient Identifier List | 1 – Patient ID (0010,0020)<br><b>Inbound:</b> We read <i>MRG-1.1</i> , <i>MRG-4.1</i> in that order<br><b>Outbound:</b> We copy to <i>MRG-4.1</i><br><br>4 – Issuer Of Patient ID (0010,0021)<br><b>Inbound:</b><br>We read <i>MRG-1.4</i> , <i>MRG-4.4</i> . If both are blank, then we assume that the Prior Patient Issuer is the same as the Current Patient.<br><b>Outbound:</b> We copy to <i>MRG-4.4</i> |
| 4   | 64               | CX        | C       | Prior Patient ID              | See <i>MRG:1</i>                                                                                                                                                                                                                                                                                                                                                                                                |

## 6.9 ORC

The ORC segment contains Order Control and status information.

| Seq | Length | Data Type | Inbound | Description              | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                  |
|-----|--------|-----------|---------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 1 - 2  | ID        | R       | Order Control Code       | 1 – Order Control Code (mapped to RamSoft Statuses)                                                                                                                                                                                                                                                    |
| 2   | 16     | EI        | O       | Placer Order Number      | See <i>OBR-2</i>                                                                                                                                                                                                                                                                                       |
| 3   | 64     | EI        | O       | Filler Order Number      | See <i>OBR-3</i>                                                                                                                                                                                                                                                                                       |
| 5   | 1 - 2  | ID        | O       | Order Status             | 1 – Order Status (mapped to RamSoft Statuses)                                                                                                                                                                                                                                                          |
| 7   | 200    | TQ        | O       | Quantity / Timing        | See <i>OBR-27</i>                                                                                                                                                                                                                                                                                      |
| 8   | 1 - 16 | EIP       | O       | Parent                   | See <i>OBR-29.1.1</i>                                                                                                                                                                                                                                                                                  |
| 9   | 26     | TS        | O       | Date/Time of Transaction | <b>Outbound:</b> Date/time of message                                                                                                                                                                                                                                                                  |
| 10  | 64     | XCN       | O       | Entered By               | <b>Outbound:</b> Username that last updated the study                                                                                                                                                                                                                                                  |
| 12  | 60     | XCN       | O       | Ordering Provider        | See <i>OBR-16</i>                                                                                                                                                                                                                                                                                      |
| 13  | 60     | PL        | O       | Enterer's Location       | <b>Inbound:</b> Updates referring physician assigned facility if <i>OBR-16.14</i> , <i>ORC-12.14</i> , <i>PV1-8.14</i> , <i>PV1-7.14</i> , and <i>ORC-17</i> are blank and facility is setup as a "Referring Facility"<br><b>Outbound:</b><br>4 – We Copy <i>ORC-17</i>                                |
| 14  | 1-64   | XTN       | O       | Call Back Phone Number   | See <i>OBR-17</i>                                                                                                                                                                                                                                                                                      |
| 17  | 60     | CE        | O       | Entering Organization    | <b>Inbound:</b> Updates referring physician assigned facility if <i>OBR-16.14</i> , <i>ORC-12.14</i> , <i>PV1-8.14</i> , and <i>PV1-7.14</i> are blank and facility is setup as a "Referring Facility"<br><b>Outbound:</b> We use Referring Assigned Facility. If it is empty, we use Institution Name |

### 6.9.1 ORC-1 and ORC-5 Status Mappings

| RamSoft Status Code (Default)      | ORC-1 Value | ORC-5 Value |
|------------------------------------|-------------|-------------|
| <30                                | SN or NW    | SC          |
| 30 to 69                           | SC          | SC          |
| 70 to 79                           | SC          | ZA          |
| 80 to 89                           | OC          | CA          |
| 90 to 99                           | SC          | IP          |
| 100 to 104                         | SC          | ZP          |
| 105 to 109, 115 to 129, 150 to 159 | SC          | CM          |
| 110 to 114                         | DC          | CA          |
| 130 to 139                         | SC          | HD          |
| 140 to 149                         | SC          | CA          |
| 160 to 179                         | SC          | ZW          |
| 180 to 189                         | SC          | ZX          |
| 190 to 199                         | SC          | ZY          |
| >= 200                             | SC          | ZZ          |

**Inbound:** We always set the status code to the lowest code in the range.

## 6.10 OBR

The Observation Request (OBR) segment defines the attributes for a diagnostic study. Each OBR segment contains only one Study Type Code in *OBR-4.1* and one Procedure Code in *OBR-44*. Multiple OBR segments should be used when the study contains multiple study types or multiple procedure codes.

| Seq | Length                                                    | Data Type | Inbound | Description                  | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----|-----------------------------------------------------------|-----------|---------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2   | 16                                                        | EI        | O       | Placer Order Number          | See <i>OBR-18</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 3   | 64                                                        | EI        | O       | Filler Order Number          | User-defined Text Field 1<br><b>Inbound:</b> We read <i>OBR-3</i> , <i>ORC-3</i> in that order<br><b>Outbound:</b> If blank, we send Accession Number.<br>We copy to <i>ORC-3</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 4   | 1 - 64<br>2 - 64                                          | CE        | O       | Universal Service Identifier | 1 – Study Type Code<br>2 – Study Description (0008, 1030)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 7   | 26                                                        | TS        | O       | Observation Date/Time        | <b>Outbound:</b> Date/time of message                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 12  | 1                                                         | CE        | O       | Danger Code                  | <b>Inbound:</b> We read <i>OBR-27.6</i> , <i>ORC-7.6</i> , <i>OBR-12</i> , in that order.<br><b>Outbound:</b> We copy <i>OBR-27.6</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 13  | 2000                                                      | ST        | O       | Relevant Clinical Info       | History<br><b>Inbound:</b><br>- Stored as case sensitive<br>- Allow receiving multiple types of line break (See <i>NTE-3</i> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 15  | 4 - 64<br>5 - 1                                           | CM        | O       | Specimen Source              | 4 – Body Part ( <i>0018,0015</i> )<br>5 – Laterality ( <i>0020,0060</i> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 16  | 1 - 16<br>2 - 64<br>3 - 64<br>4 - 64<br>6 - 64<br>14 - 64 | XCN       | O       | Ordering Provider            | Referring Physician<br><b>Inbound:</b> We read <i>OBR-16</i> , <i>ORC-12</i> , <i>PV1-8</i> , <i>PV1-7</i> in that order<br><b>Outbound:</b> We copy to <i>ORC-12</i> , <i>PV1-8</i> , <i>PV1-7</i><br>1 – ID Number<br><b>Inbound:</b> Update physician's NPI only if both imaging facility and physician are registered in our system.<br><b>Outbound:</b> Sends physician's NPI.<br><br>2 – Family Name ( <i>0008,0090</i> )<br>3 – Given Name ( <i>0008,0090</i> )<br>4 – Middle Name<br>5 – Suffix<br>6 – Prefix<br>14 – Assigned facility name<br><b>Inbound:</b><br>- We read <i>OBR-16.14</i> , <i>ORC-12.14</i> , <i>PV1-8.14</i> , <i>PV1-7.14</i> , <i>ORC-17</i> , <i>ORC.13</i> in that order<br>- Only update physician's facility if the facility is registered in our system as a Referring Facility and is associated with the physician.<br><b>Outbound:</b> Sends physician's assigned facility. |
| 17  | 1 - 64                                                    | XTN       | O       | Call Back Phone Number       | 1 – Referring Physician Business Phone Number<br><b>Inbound:</b><br>- If it is empty, we read <i>ORC-14</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Seq | Length                      | Data Type | Inbound | Description             | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----|-----------------------------|-----------|---------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                             |           |         |                         | - Only update if the USERNAME is configured on the interface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 18  | 16                          | ST        | R       | Placer Field 1          | 1 – Accession Number (0008,0050)<br><b>Inbound:</b><br>We handle multiple Accession Number for study grouping. It is delimited with ~<br>e.g. RAM123~RAM456~RAM789<br><b>Outbound:</b> We copy to OBR-2, OBR-20, ORC-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 19  | 1 - 16                      | ST        | O       | Placer Field 2          | 1 – Requested Procedure ID (0040, 1001)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 20  | 16                          | ST        | O       | Filler Field 1          | See OBR-18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 24  | 1 - 16                      | ID        | O       | Diagnostic Serv Sect ID | 1 – Scheduled Modality (0008,0060)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 27  | 1 – 16<br>4 – 26<br>6 – 1   | TQ        | O       | Quantity/Timing         | <b>Inbound:</b> We read OBR-27, ORC-7, OBR-12 (for priority only) in that order<br><b>Outbound:</b> We copy to ORC-7<br><br>1 - Quantity<br>4 – Study Date Time<br>• Study Date (0008,0020)<br>• Study Time (0008,0030)<br>6 – Priority (0040,1003)<br>'S' – 'STAT'<br>'A' – 'HIGH'<br>'T' or 'P' – 'MEDIUM'<br>'R' – 'ROUTINE'<br>'C' – 'CRITTEST' or 'CRITFIND'<br>All multi-valued priorities are mapped to the first priority listed above.<br><br><b>Inbound:</b> If input value does not match any of the above values, then a database search is performed against the string value received for custom priorities. If no match is found, then we default to ROUTINE.<br><br><b>Outbound:</b> For non-default values, we send the full string value. |
| 29  | 1 – 16                      | EIP       | O       | Parent                  | 1 – Parent's Accession Number<br><b>Inbound:</b> Currently ignored.<br><b>Outbound:</b> We populate PRIMARY_ACCESSIONNUMBER for grouped studies. We copy this to ORC-8.1.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 30  | 20                          | ID        | O       | Transportation Mode     | <b>Outbound:</b> Always set to preconfigured variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 31  | 1 – 64<br>2 – 250<br>3 – 64 | CE        | O       | Reason for Study        | 1 – Diagnosis Code<br>2 – Diagnosis Description<br>3 – Name of Coding System<br><b>Inbound/Outbound:</b> "I9", "I10"<br><b>Inbound:</b><br>- Only update if not blank and if diagnosis code matches one in our database.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Seq | Length                                                   | Data Type | Inbound | Description                  | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                             |
|-----|----------------------------------------------------------|-----------|---------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                          |           |         |                              | <p>- We handle multiple Reason For Study delimited with ~<br/>e.g.  V02.0^ CARRIER OR SUSPECTED CARRIER OF; CHOLERA^I9~ V45.4^POSTPROCEDURAL; ARTHRODESIS STATUS^I9 </p> <p>- If Procedure Code is provided (OBR-45), update the DxMapping for this procedure.</p> <p><b>Outbound:</b> sends study diagnosis codes.</p> <p><u>Essential Note:</u><br/>RMC supports up to any number of Diagnosis codes per procedure code.<br/>If the Name of Coding System is blank, default coding system is used based on the study date time.<br/>If the study date time is after the start date of the ICD-10 code, it is set to " I10". If the study date time is before the end date of the ICD-9 code, it is set to "I9".</p> |                                                                                                                                                                                                                                                                                                                                                             |
| 32  | 1 – 16<br>2 – 64<br>3 – 64<br>4 – 64<br>5 – 64<br>6 – 64 | CM        | O       | Principal Result Interpreter | 1 – Reading Physician                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>1 – ID Number<br/><b>Inbound:</b> Updates Physician's NPI<br/>only if both Imaging Facility and Physician are registered in our system.<br/><b>Outbound:</b> Sends Physician's NPI.</p> <p>2 – Family Name (0008,1060)<br/>3 – Given Name (0008,1060)<br/>4 – Middle Name (0008,1060)<br/>5 – Suffix (0008,1060)<br/>6 – Prefix (0008,1060)</p>          |
| 34  | 1 – 16<br>2 – 64<br>3 – 64<br>4 – 64<br>5 – 64<br>6 – 64 | CM        | O       | Technician                   | 1 – Performing Technologist                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>1 – ID Number<br/><b>Inbound:</b> Updates Technologist's NPI<br/>only if both Imaging Facility and Technologist are registered in our system.<br/><b>Outbound:</b> Sends Technologist's NPI.</p> <p>2 – Family Name (0008,1070)<br/>3 – Given Name (0008,1070)<br/>4 – Middle Name (0008,1070)<br/>5 – Suffix (0008,1070)<br/>6 – Prefix (0008,1070)</p> |
| 35  | 1 – 16<br>2 – 64<br>3 – 64<br>4 – 64                     | CM        | O       | Transcriptionist             | 1 – Transcriptionist                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>1 – ID Number<br/><b>Inbound:</b> Updates Transcriptionist's NPI only if both Imaging Facility and</p>                                                                                                                                                                                                                                                   |

| Seq | Length                      | Data Type | Inbound | Description             | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                     |
|-----|-----------------------------|-----------|---------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | 5 – 64<br>6 – 64            |           |         |                         | Transcriptionist are registered in our system.<br><b>Outbound:</b> Sends Transcriptionist's NPI.<br><br>2 – Family Name (4008,010a)<br>3 – Given Name (4008,010a)<br>4 – Middle Name (4008,010a)<br>5 – Suffix (4008,010a)<br>6 – Prefix (4008,010a)                                                                                                                                      |
| 39  | 2000                        | CE        | O       | Collector's Comments    | Comments<br><b>Inbound:</b><br>- Stored as case sensitive<br>- Allow receiving multiple types of line break (See NTE-3)                                                                                                                                                                                                                                                                   |
| 41  | 30                          | ID        | O       | Transport Arranged      | <b>Outbound:</b> Always set to preconfigured variable                                                                                                                                                                                                                                                                                                                                     |
| 44  | 1 – 64<br>2 – 250<br>3 – 64 | CE        | O       | Procedure Code          | 1 – Procedure Code (0008,1032)<br>2 – Procedure Description (0008,1032)<br>3 – Procedure Coding System<br><b>Inbound:</b> Only update if not blank. If the procedure code is not in our database, then add it along with procedure code description.<br>Only 1 procedure code is allowed for 1 OBR segment. So, for multiple procedure codes in a study, we expect multiple OBR segments. |
| 45  | 80                          | CE        | O       | Procedure Code Modifier | 1 – Procedure Code Modifier<br>Multiple modifiers are sent delimited with ~<br><b>Inbound:</b> Only update if not blank.                                                                                                                                                                                                                                                                  |

## 6.11 NTE

The notes and comments segment (NTE) is used for sending notes and comments.

| Seq | Length | Data Type | Inbound | Description       | Sub Field and DICOM Element                                                                                                                                                                                         |
|-----|--------|-----------|---------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4      | SI        | O       | Set ID - NTE      | <b>Outbound:</b> Sequential Number                                                                                                                                                                                  |
| 2   | 8      | ID        | O       | Source of Comment | <b>Outbound:</b> Always set to 'O'                                                                                                                                                                                  |
| 3   | 2000   | FT        | O       | Comment           | Clinical Notes<br><b>Inbound:</b><br>- Stored as case sensitive<br>- Allow receiving following characters as a line break:<br>- \X0D0A\, \X0A0D\, \X0A\, \X0D\<br>- \E\r, \E\n<br>- \.br\<br>- \r\n<br>- ~<br>- \R\ |
| 4   | 250    | CE        | O       | Comment Type      | <b>Outbound:</b> Always set to 'RE'                                                                                                                                                                                 |

## 6.12 ZDS

ZDS is a custom segment defined by IHE to store the DICOM Study Instance UID being referred to in an order message. Any system that does not store the DICOM Study Instance UID should omit this segment.

| Seq | Length                                  | Data Type | Inbound | Description        | Component, Database and DICOM Mapping                                                                                                                                                               |
|-----|-----------------------------------------|-----------|---------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 1 – 64<br>2 – 200<br>3 – 200<br>4 – 200 | RP        | O       | Study Instance UID | 1 – Study Instance UID ( <i>0020,000D</i> )<br>2 – 'RAMSOFT'<br>3 – 'Application'<br>4 – 'DICOM'<br><b>Inbound:</b> Only process this segment if <i>ZDS-1.3</i> and <i>ZDS-1.4</i> match the above. |

## 6.13 OBX Height and Weight

This OBX segment contains the patient's height and weight.

| Seq | Length | Data Type | Inbound | Description               | Component, Database and DICOM Mapping                                                                                                                                                                                                                                             |
|-----|--------|-----------|---------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4      | SI        | O       | Set ID - OBX              | <b>Outbound:</b> Sequential number                                                                                                                                                                                                                                                |
| 2   | 3      | ID        | O       | Value Type                | <b>Outbound:</b> 'ST'                                                                                                                                                                                                                                                             |
| 3   | 2 – 80 | CE        | R       | Observation Identifier    | 2 – 'BODY HEIGHT' or 'BODY WEIGHT'                                                                                                                                                                                                                                                |
| 5   | 65536  | REAL      | R       | Observation Value         | Height or Weight according to unit type shown in OBX.6                                                                                                                                                                                                                            |
| 6   | 60     | CE        | R       | Units                     | For 'BODY HEIGHT': 'm', 'cm', 'in'<br>For 'BODY WEIGHT': 'kg', 'lb'<br><b>Inbound:</b><br>If input value does not match above types, use default type:<br>'cm' for 'BODY HEIGHT'<br>'kg' for 'BODY WEIGHT'<br><b>Outbound:</b><br>'m' for 'BODY HEIGHT'<br>'kg' for 'BODY WEIGHT' |
| 11  | 1      | ID        | O       | Observation Result Status | <b>Outbound:</b> 'F'                                                                                                                                                                                                                                                              |

## 6.14 OBX Report

This OBX segment contains report data. This segment is normally used when transmitting an SR report created by a reading physician.

We support sending the entire report in a single OBX segment, or multiple consecutive OBX segments. We can break the segments using any configured delimiter such as '\r\n' escape sequence. We also support other delimiters, or we can break the segment by a configurable size. We have configuration option to choose the desired method.

| Seq | Length                     | Data Type | Inbound | Description            | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----|----------------------------|-----------|---------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4                          | SI        | O       | Set ID - OBX           | <b>Outbound:</b> Sequential number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 2   | 3                          | ID        | O       | Value Type             | <b>Outbound:</b> 'FT' for Text, RTF, HTML or 'CE' for binary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 3   | 1 – 64<br>2 – 80<br>4 – 80 | CE        | R       | Observation Identifier | <p>1 – Identifier<br/> <b>Inbound:</b> We use as SOP Instance UID of report.<br/> - If there is an existing report based on this SOP Instance UID, we ignore this report.<br/> - If the value is empty or the report based on SOPInstanceUID does not exist, we continue to process the report.<br/> <b>Outbound:</b> SOP Instance UID of report</p> <p>2 – Document Type<br/> <b>Inbound:</b> 'TXT', 'RTF', 'PDF', 'DOC', 'DOCM', 'DOCX', 'HTML', 'TIF', 'RTF'<br/> <b>Outbound:</b> 'TXT', 'RTF', 'PDF', 'DOC', 'DOCM', 'DOCX', 'HTML', 'TIF', 'RTF'</p> <p>4 – Document Type ID<br/> Used to identify the type of document<br/> <b>Inbound:</b><br/> If the value is empty or does not match any of supported document type Ids, we use value from REPORT_DOCUMENT_TYPE_ID<br/> Note: PDF is not supported for Diagnostic Reports inbound</p> <p>Supported Document Types<br/> 1 – Diagnostic Report (default)<br/> 90000 – Diagnostic Preliminary<br/> 90001 – Admin<br/> 90002 – Clinical<br/> 90003 – Study Form<br/> 90004 – Instruction<br/> 90005 – Mammo<br/> 90006 – RIS<br/> 90007 – RX<br/> 90008 – Screening<br/> 90009 – Referral<br/> 91001 – Insurance Card<br/> 91002 – Patient Forms<br/> 91003 – Labs<br/> 91004 – Patient Registration Form</p> |

| Seq | Length                                                   | Data Type | Inbound | Description               | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----|----------------------------------------------------------|-----------|---------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                          |           |         |                           | 91005 – Patient Insurance Cards<br>91006 – HIPAA Consent Form<br>91007 – Medical Records Release Form<br>91008 – Prior Report<br>90010 – Mammo Patient Reminder Letter<br>90011 – Mammo Referrer Reminder Letter<br>90012 – Mammo Patient Lay Letter<br>90013 – Mammo Referrer Lay Letter<br>99999 – Surgery Consultation Report                                                                                                                                                         |
| 5   | 1 - 65536                                                | *         | R       | Observation Value         | 1 – Report Text ( <i>0040, a160</i> )<br>Report may be formatted in TXT, RTF or HTML without encoding. If report is base64 encoded, it may be formatted in PDF, DOC, DOCM, DOCX, or TIFF<br><b>Inbound:</b><br>- For TXT report, allow receiving multiple types of line break (See <i>NTE-3</i> ) and stored as case sensitive.<br>Note: PDF is not supported for Diagnostic Reports inbound                                                                                             |
| 11  | 1 – 1                                                    | ID        | C       | Observation Result Status | 1 – Result Status; specifies status of the report<br>"A" – Addendum<br>"F" – Final (verified / signed)<br>"P" – Preliminary<br><b>Inbound:</b><br>- Allow to receive signed addendum report if observer and date/time of observation are provided. This is required to file the report as FINAL or ADDENDUM.                                                                                                                                                                             |
| 14  | 1 – 26                                                   | TS        | C       | Date/Time of Observation  | 1 – Date/Time of Observation ( <i>0008,002A</i> )<br>Date / time when report was created or verified / signed. This is required to file the report as FINAL or ADDENDUM.                                                                                                                                                                                                                                                                                                                 |
| 16  | 1 – 16<br>2 – 64<br>3 – 64<br>4 – 64<br>5 – 64<br>6 – 64 | PN        | C       | Responsible Observer      | Physician that verified / signed the report.<br>1 – ID Number ( <i>0040, a088</i> ) Sequence > ( <i>0008, 0100</i> ) Code Value<br><b>Inbound:</b> Do not updates physician's NPI. This is required to file the report as FINAL or ADDENDUM.<br><b>Outbound:</b> Sends physician's NPI<br>2 – Family Name ( <i>0040, a075</i> )<br>3 – Given Name ( <i>0040, a075</i> )<br>4 – Middle Name ( <i>0040, a075</i> )<br>5 – Suffix ( <i>0040, a075</i> )<br>6 – Prefix ( <i>0040, a075</i> ) |
| 17  | 60                                                       | CE        | O       | Observation Method        | <b>Outbound:</b> 'PRELIMINARY', 'ADDENDUM', or 'FINAL'                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## 6.15 SCH

The SCH segment contains information about the scheduled appointment.

| Seq | Length                                                              | Data Type | Inbound | Description                    | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----|---------------------------------------------------------------------|-----------|---------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4                                                                   | SI        | O       | Placer Appointment ID          | <b>Outbound:</b> Accession Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 11  | 1 – 4<br>3 – 20<br>4 – 26<br>5 – 26<br>6 – 16                       | TQ        | O       | Appointment Timing<br>Quantity | <p>1 – Quantity (Sequence number of Procedures)<br/> <b>Inbound:</b> We update the quantity of procedure according to AIS segments<br/> 3 – Duration<br/> 4 – Appointment Start Time<br/> <b>Outbound:</b> Start Time of Appointment<br/> 5 – Appointment Finish Time<br/> <b>Inbound:</b> We read it only if <i>AIS-7.1</i> and <i>SCH-11.3</i> is empty<br/> <b>Outbound:</b> Finish Time of Appointment<br/> 6 – Priority (<i>0040,1003</i>)<br/> 'S' – 'STAT'<br/> 'A' – 'HIGH'<br/> 'T' or 'P' – 'MEDIUM'<br/> 'R' – 'ROUTINE'<br/> 'C' – 'CRITTEST' or 'CRITFIND'<br/> <b>Inbound:</b> If input value does not match any of the above values, then a database search is performed against the string value received for custom priorities. If no match is found, then we default to ROUTINE.<br/> <b>Outbound:</b> For non-default values, we send the full string value.<br/> We can send multiple Quantity delimited with ~<br/> e.g.  <br/> 1^^30^20150701064500+0000^20150701064600+0000^R<br/> ~2^^45^20150701164500+0000^20150701264600+0000^R </p> |
| 15  | 1 – 64<br>2 – 64<br>4 – 64<br>6 – 16<br>9 – 64                      | PL        | O       | Assigned Patient Location      | <p>1 – Department (must exist under Locations on the corresponding facility)<br/> 2 – Room (must exist under Locations on the corresponding facility)<br/> 4 – Imaging Facility / Institution Name (<i>0008, 0080</i>)<br/> 6 – Patient's Location Code (not displayed or editable in our system)<br/> 9 – Patient's Location (<i>0038,0300</i>)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 16  | 1 – 16<br>2 – 64<br>3 – 64<br>4 – 64<br>5 – 64<br>6 – 64<br>14 – 64 | XCN       | O       | Filler Contact Person          | <p>Referring Physician<br/> 1 – ID Number<br/> <b>Inbound:</b> Updates Physician's NPI only if both Imaging Facility and Physician are registered in our system.<br/> <b>Outbound:</b> Sends Physician's NPI.<br/> 2 – Family Name (<i>0008,0090</i>)<br/> 3 – Given Name (<i>0008,0090</i>)<br/> 4 – Middle Name (<i>0008,0090</i>)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Seq | Length | Data Type | Inbound | Description             | Component, Database and DICOM Mapping                                                                                                                                                                                                                                          |
|-----|--------|-----------|---------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |        |           |         |                         | 5 – Suffix (0008,0090)<br>6 – Prefix (0008,0090)<br>14 – Assigned Facility Name<br><b>Inbound:</b> Only update Physician's facility if the facility is registered in our system and is associated with the physician.<br><b>Outbound:</b> Sends Physician's assigned facility. |
| 20  | 1 – 1  | SI        | O       | Created by Blocked List | Created by Blocked List<br>'Y'<br>'N'<br><b>Inbound:</b><br>- For other values, we set it 'N'<br>- If it is 'Y', we insert/update appointment to a block note.<br><b>Outbound:</b><br>If this appointment created by blocked list, set to 'Y'<br>Otherwise, 'N'                |
| 25  | 200    | CE        | O       | Filler Status Code      | <b>Outbound:</b> 1 – Order Status (mapped to RamSoft Statuses)                                                                                                                                                                                                                 |
| 26  | 1 – 16 | EI        | C       | Placer Order Number     | 1 – Accession Number (0008,0050)<br><b>Inbound:</b> We read SCH-26, SCH-27 in that order. One of these values is required.                                                                                                                                                     |
| 27  | 16     | EI        | C       | Filler Appointment ID   | See SCH-26                                                                                                                                                                                                                                                                     |

## 6.16 RGS

The resource group segment (RGS) is used to identify the resource for a scheduled event. There is one group (RGS, AIS) per appointment booking.

| Seq | Length | Data Type | Inbound | Description   | Component, Database and DICOM Mapping                                                          |
|-----|--------|-----------|---------|---------------|------------------------------------------------------------------------------------------------|
| 1   | 4      | SI        | O       | Set ID - RGS  | Sequential number                                                                              |
| 3   | 200    | CE        | R       | Resource Name | <b>Inbound:</b> Resource Name<br><b>Outbound:</b> Resource Name that exists within PowerReader |

## 6.17 AIS

The appointment information service segment (AIS) specifies the details of the appointment.

| Seq | Length           | Data Type | Inbound | Description                  | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                               |
|-----|------------------|-----------|---------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4                | SI        | O       | Set ID – AIS                 | Sequential number                                                                                                                                                                                                                                                                                                                                                                   |
| 3   | 1 – 64<br>2 – 64 | CE        | R       | Universal Service Identifier | 1 – Procedure Code (0008,1032)<br>2 – Procedure Description (0008,1032)                                                                                                                                                                                                                                                                                                             |
| 4   | 1 – 26           | TS        | C       | Start Date/Time              | Appointment Date/Time <ul style="list-style-type: none"> <li>Appointment Date</li> <li>Appointment Time</li> </ul> <b>Inbound:</b> <ul style="list-style-type: none"> <li>- If it is empty, we read <i>SCH-11.4</i></li> <li>- We also use it as appointment start time</li> </ul>                                                                                                  |
| 5   | 20               | NM        | O       | Start Date/Time Offset       | UTC offset of Study Date Time                                                                                                                                                                                                                                                                                                                                                       |
| 7   | 20               | NM        | O       | Duration                     | Study Duration <b>Inbound:</b> <ul style="list-style-type: none"> <li>- If it is empty, we read <i>SCH-11.3</i></li> <li>- We use it to calculate the appointment finish time</li> </ul>                                                                                                                                                                                            |
| 8   | 200              | CE        | O       | Unit                         | <b>Outbound:</b> Default is 'min'                                                                                                                                                                                                                                                                                                                                                   |
| 10  | 200              | CE        | O       | Filler Status Code           | HL7 Filler Status Code<br>1 – Filler Status Code (mapped to RamSoft Appointment Statuses) <b>Inbound:</b> <ul style="list-style-type: none"> <li>- For new appointment, if it is empty or other values, we set RamSoft Appointment status of 0</li> <li>- For update existing appointment, only update if it is valid value</li> <li>- We ignore if <i>SCH-20</i> is 'Y'</li> </ul> |

### 6.17.1 AIS-10 Status Mappings

| Inbound HL7 Filler Status Code | RamSoft Appointment Status Code | Outbound HL7 Filler Status Code |
|--------------------------------|---------------------------------|---------------------------------|
| PENDING                        | 2 (Need to reschedule)          | PENDING                         |
| WAITLIST                       | 0 (Not yet confirmed)           | WAITLIST                        |
| BOOKED                         | 1 (Confirmed)                   | BOOKED                          |
| STARTED                        | 6 (Arrived)                     | STARTED                         |
| COMPLETE                       | 7 (ReadyForScan)                | COMPLETE                        |
| CANCELLED                      | 3 (Cancelled)                   | CANCELLED                       |
| DC                             | 3 (Cancelled)                   | CANCELLED                       |
| DELETED                        | 3 (Cancelled)                   | CANCELLED                       |
| BLOCKED                        | 5 (Blocked time)                | BLOCKED                         |
| OVERBOOK                       | 1 (Confirmed)                   | BOOKED                          |
| NOSHOW*                        | 4 (No show)                     | NOSHOW*                         |

Note: "NOSHOW" is not HL7 standard, it is custom.

## 6.18 GT1

The guarantor segment (GT1) contains the information about the person or organization with financial responsibility for payment of a patient account.

| Seq | Length                                         | Data Type | Inbound | Description                | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                   |
|-----|------------------------------------------------|-----------|---------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4                                              | SI        | O       | Set ID – GT1               | Sequential number                                                                                                                                                                                                                                                                       |
| 2   | 1 – 64                                         | CX        | O       | Guarantor Number           | <b>Outbound:</b><br>We populate Internal Patient ID of RS system                                                                                                                                                                                                                        |
| 3   | 1 – 64<br>2 – 64<br>3 – 64<br>4 – 64<br>5 – 64 | XPB       | O       | Guarantor Name             | 1 – Family Name<br>2 – Given Name<br>3 – Middle Name<br>4 – Suffix<br>5 – Prefix                                                                                                                                                                                                        |
| 5   | 1 – 256<br>3 – 24<br>4 – 3<br>5 – 10<br>6 – 3  | XAD       | O       | Guarantor Address          | 1 – Street Address<br>3 – City<br>4 – State/Province<br>5 – Zip/Postal Code<br>6 – Country                                                                                                                                                                                              |
| 6   | 1 – 64                                         | XTN       | O       | Guarantor Home Phone       | 1 – Phone Number                                                                                                                                                                                                                                                                        |
| 7   | 1 – 64                                         | XTN       | O       | Guarantor Business Phone   | 1 – Phone Number                                                                                                                                                                                                                                                                        |
| 8   | 26                                             | TS        | O       | Guarantor's Date Of Birth  | Guarantor's Birth Date                                                                                                                                                                                                                                                                  |
| 9   | 1                                              | IS        | O       | Guarantor Sex              | 'F' – 'FEMALE'<br>'M' – 'MALE'<br>'O' – 'OTHER'<br>'U' – NULL<br><b>Inbound:</b><br>- For new patient, we translate all other values to 'OTHER'<br>- For existing patient, we ignore to update for all other values                                                                     |
| 11  | 64                                             | CE        | O       | Guarantor Relationship     | Guarantor Relation to Patient<br>'SEL' – 'SELF'<br>'SPO' – 'SPOUSE'<br>'CHD' – 'CHILD'<br>'OTH' – 'OTHER'<br>'PAR' – 'PARENT/GUARDIAN'<br><b>Inbound:</b> All other values will be stored as 'OTHER'<br><b>Outbound:</b> PAR should show value that will send for Parent in ORM message |
| 16  | 1 – 64                                         | XPB       | O       | Guarantor Employer Name    | 1 – Patient's Employer Name                                                                                                                                                                                                                                                             |
| 17  | 1 – 256<br>3 – 24<br>4 – 3<br>5 – 10<br>6 – 2  | XAD       | O       | Guarantor Employer Address | Patient's Employer's Address<br>1 – Street Address<br>3 – City<br>4 – State/Province<br>5 – Zip/Postal Code<br>6 – Country                                                                                                                                                              |

| Seq | Length                                         | Data Type | Inbound | Description                     | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                |
|-----|------------------------------------------------|-----------|---------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18  | 1 – 64                                         | XTN       | O       | Guarantor Employer Phone Number | 1 – Patient's Employer's Phone Number                                                                                                                                                                                                                                                                |
| 20  | 1                                              | IS        | O       | Guarantor Employment Status     | Patient's Employment Status<br>'1' – 'FULL-TIME'<br>'2' – 'PART-TIME'<br>'3' – 'UNEMPLOYED'<br>'5' – 'RETIRED'<br>'S' – 'STUDENT'<br>'O' – 'OTHER' (default value used for all others)<br>'9' – 'OTHER'                                                                                              |
| 45  | 1 – 64<br>2 – 64<br>3 – 64<br>4 – 64<br>5 – 64 | XPN       | O       | Contact Person's Name           | Patient's Emergency Contact<br>1 – Family Name<br>2 – Given Name<br>3 – Middle Name<br>4 – Suffix<br>5 – Prefix                                                                                                                                                                                      |
| 46  | 1 – 64                                         | XTN       | O       | Contact Person's Phone Number   | Patient's Emergency Contact Phone Number<br>1 – Phone Number                                                                                                                                                                                                                                         |
| 48  | 64                                             | IS        | O       | Contact Relationship            | Patient's Emergency Contact's Relationship<br>'SEL' – 'SELF'<br>'SPO' – 'SPOUSE'<br>'CHD' – 'CHILD'<br>'OTH' – 'OTHER'<br>'PAR' – 'PARENT/GUARDIAN'<br><b>Inbound:</b> All other values will be stored as 'OTHER'<br><b>Outbound:</b> PAR should show value that will send for Parent in ORM message |

## 6.19 IN1

The Insurance segment (IN1) contains the patient's insurance policy coverage information.

| Seq | Length           | Data Type | Inbound | Description          | Component, Database and DICOM Mapping                                                                        |
|-----|------------------|-----------|---------|----------------------|--------------------------------------------------------------------------------------------------------------|
| 1   | 4                | SI        | O       | Set ID – IN1         | Insurance Level<br>- "1" if Primary Insurance<br>- "2" if Secondary Insurance<br>- "3" if Tertiary Insurance |
| 2   | 64               | CE        | C       | Insurance Plan ID    | See <i>IN1-49</i>                                                                                            |
| 3   | 1 – 64<br>2 – 64 | CX        | R       | Insurance Company ID | Insurance Company ID<br>1 - Insurance Company Carrier ID<br>2 - Insurance Company Eligibility Payer ID       |

| Seq | Length                                        | Data Type | Inbound | Description                 | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----|-----------------------------------------------|-----------|---------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4   | 64                                            | XON       | O       | Insurance Company Name      | Insurance Company Payer Name                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 5   | 1 – 256<br>3 – 24<br>4 – 3<br>5 – 10<br>6 – 2 | XAD       | O       | Insurance Company Address   | Insurance Company Address<br>1 – Street Address<br>3 – City<br>4 – State/Province<br>5 – Zip/Postal Code<br>6 – Country                                                                                                                                                                                                                                                                                                                                                 |
| 6   | 64                                            | XPB       | O       | Insurance Co Contact Person | Insurance Company Contact Name                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 7   | 1 – 64<br>4 – 64<br>9 – 64                    | XTN       | O       | Insurance Co Phone Number   | 1 - Insurance Company Business Phone Number<br>4 – Insurance Company Email Address<br>9 – Insurance Company Website                                                                                                                                                                                                                                                                                                                                                     |
| 8   | 64                                            | ST        | O       | Group Number                | Insurance Group Number                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 11  | 64                                            | XON       | O       | Insured's Group Emp Name    | Insured's Employer Name                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 12  | 8                                             | DT        | O       | Plan Effective Date         | Insurance Effective From                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 13  | 8                                             | DT        | O       | Plan Expiration Date        | Insurance Effective To                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 14  | 1 – 64<br>2 – 26                              | CM        | O       | Authorization Information   | 1 – Study's Authorization Number<br><b>Inbound:</b> Update study's authorization number if it is present and AUT-6 is empty.<br><b>Outbound:</b> We populate this based on the current study for DFT messages. We also only populate this based on conjunction with study level message (ORM/ORU/DFT) for ADT messages.<br>2 – Study's Authorization Start Datetime<br><b>Inbound:</b> Update study's authorization start datetime if it is present and AUT-4 is empty. |
| 15  | 64                                            | IS        | O       | Plan Type                   | Patient's Financial Type<br>'CP' – 'CAPITATED'<br>'SP' – 'SELF-PAY'<br>'CM' – 'COMMERCIAL'<br>'ME' – 'MEDICARE'<br>'OT' – 'OTHER'<br>'OH' – 'OHIP'<br>'MA' – 'MEDICAID'<br>'WC' – 'WORKERS COMP'<br><b>Inbound:</b><br>If we receive values not listed above, we will:<br>- Use system config for default value in case of inserting<br>- Ignore in case of updating                                                                                                    |
| 16  | 1 – 64<br>2 – 64<br>3 – 64                    | XPB       | O       | Name Of Insured             | Insured's Name<br>1 – Family Name<br>2 – Given Name<br>3 – Middle Name                                                                                                                                                                                                                                                                                                                                                                                                  |

| Seq | Length                                        | Data Type | Inbound | Description                       | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                       |
|-----|-----------------------------------------------|-----------|---------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17  | 64                                            | CE        | O       | Insured's Relationship to Patient | Insured's Relationship to Patient<br>'SEL' – 'SELF'<br>'SPO' – 'SPOUSE'<br>'CHD' – 'CHILD'<br>'OTH' – 'OTHER'<br>'PAR' – 'PARENT/GUARDIAN'<br><b>Inbound:</b> All other values will be stored as 'OTHER'<br><b>Outbound:</b> PAR should show value that will send for Parent in ORM message |
| 18  | 26                                            | TS        | O       | Insured's Date Of Birth           | Insured's Birth Date                                                                                                                                                                                                                                                                        |
| 19  | 1 – 256<br>3 – 24<br>4 – 3<br>5 – 10<br>6 – 2 | XAD       | O       | Insured's Address                 | Insured's Address<br>1 – Street Address<br>3 – City<br>4 – State/Province<br>5 – Zip/Postal Code<br>6 – Country                                                                                                                                                                             |
| 35  | 1 - 64                                        | IS        | O       | Insurance Company ID              | Insurance Payer ID                                                                                                                                                                                                                                                                          |
| 42  | 64                                            | CE        | O       | Insured's Employment Status       | Insured Employment Status<br>'1' – 'FULL-TIME'<br>'2' – 'PART-TIME'<br>'3' – 'UNEMPLOYED'<br>'5' – 'RETIRED'<br>'S' – 'STUDENT'<br>'O' – 'OTHER' (default value used for all others)<br>'9' – 'OTHER'                                                                                       |
| 43  | 1                                             | IS        | O       | Insured's Sex                     | Insured Sex<br>'F' – 'FEMALE'<br>'M' – 'MALE'<br>'O' – 'OTHER'<br>'U' – NULL<br><b>Inbound:</b><br>- For new insurance, we translate all other values to 'OTHER'<br>- For existing insurance, we ignore to update for all other values                                                      |
| 44  | 1 – 256<br>3 – 24<br>4 – 3<br>5 – 10<br>6 – 2 | XAD       | O       | Insured's Employer's Address      | Insured's Employer's Address<br>1 – Street Address<br>3 – City<br>4 – State/Province<br>5 – Zip/Postal Code<br>6 – Country                                                                                                                                                                  |
| 45  | 1 - 2                                         | ST        | O       | Insurance Verification Status     | Verification Status<br><b>Inbound Only Read from DFT:</b><br>If empty, set to 'UNK'<br>'Y' – 'VER'<br>'N' – 'NEL'<br><b>Outbound:</b>                                                                                                                                                       |

| Seq | Length | Data Type | Inbound | Description         | Component, Database and DICOM Mapping                                                                                        |
|-----|--------|-----------|---------|---------------------|------------------------------------------------------------------------------------------------------------------------------|
|     |        |           |         |                     | 'UNK' – set to empty<br>'VER' – 'Y'<br>'NEL' – 'N'                                                                           |
| 49  | 64     | CX        | C       | Insured's ID Number | Insured ID<br><b>Inbound:</b> We read <i>IN1-49</i> , <i>IN1-2</i> in that order<br><b>Outbound:</b> We copy to <i>IN1-2</i> |

## 6.20 FT1

The financial transaction segment (FT1) contains charge details to send to the Charge Processor (billing software). Each FT1 segment contains only one Procedure Code in *FT1-25*. Multiple FT1 segments are sent when the study contains multiple procedure codes.

| Seq | Length                                         | Data Type | Inbound | Description                   | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                   |
|-----|------------------------------------------------|-----------|---------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4                                              | SI        | O       | Set ID – FT1                  | Sequential number for each FT1 segment                                                                                                                                                                                                                                                                                  |
| 2   | 80                                             | ST        | O       | Transaction ID                | Unique value for each charge (generated with InternalStudyID + '.' + Set ID)                                                                                                                                                                                                                                            |
| 4   | 26                                             | TS        | O       | Transaction Date              | Study Date Time <ul style="list-style-type: none"> <li>Study Date (0008,0020)</li> <li>Study Time (0008,0030)</li> </ul>                                                                                                                                                                                                |
| 5   | 26                                             | TS        | O       | Transaction Posting Date      | Current date and time                                                                                                                                                                                                                                                                                                   |
| 6   | 8                                              | IS        | O       | Transaction Type              | 'CG'                                                                                                                                                                                                                                                                                                                    |
| 7   | 1 – 80                                         | CE        | O       | Transaction Code              | 1 – We copy <i>FT1-2</i>                                                                                                                                                                                                                                                                                                |
| 8   | 64                                             | ST        | O       | Transaction Description       | Study Description (0008, 1030)                                                                                                                                                                                                                                                                                          |
| 10  | 6                                              | NM        | O       | Transaction Quantity          | Quantity of Procedure Code                                                                                                                                                                                                                                                                                              |
| 11  | 12                                             | CP        | O       | Transaction Amount - Extended | Charge Amount multiplied by Quantity                                                                                                                                                                                                                                                                                    |
| 12  | 12                                             | CP        | O       | Transaction Amount - Unit     | Charge Amount                                                                                                                                                                                                                                                                                                           |
| 14  | 1 – 64                                         | CE        | O       | Insurance Plan ID             | 1 - Insured ID                                                                                                                                                                                                                                                                                                          |
| 16  | 1 – 64<br>2 – 64<br>4 – 64<br>6 – 16<br>9 – 64 | PL        | O       | Assigned Patient Location     | 1 – Department (must exist under Locations on the corresponding facility)<br>2 – Room (must exist under Locations on the corresponding facility)<br>4 – Imaging Facility / Institution Name (0008, 0080)<br>6 – Patient's Location Code (not displayed or editable in our system)<br>9 – Patient's Location (0038,0300) |
| 17  | 1                                              | IS        | O       | Fee Schedule                  | Patient's Insurance's Fee Schedule Name                                                                                                                                                                                                                                                                                 |

| Seq | Length                                                              | Data Type | Inbound | Description         | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----|---------------------------------------------------------------------|-----------|---------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                     |           |         |                     | <b>Outbound:</b> We truncate this field to 1 character. Custom mapping is required if this field is required by the Charge Processor.                                                                                                                                                                                                                                                                                                                 |
| 18  | 64                                                                  | IS        | O       | Patient Type        | Patient's Financial Type<br>'CP' – 'CAPITATED'<br>'SP' – 'SELF-PAY'<br>'CM' – 'COMMERCIAL'<br>'ME' – 'MEDICARE'<br>'OT' – 'OTHER'<br>'OH' – 'OHIP'<br>'MA' – 'MEDICAID'<br>'WC' – 'WORKERS COMP'<br><b>Inbound:</b> Currently ignored                                                                                                                                                                                                                 |
| 19  | 1 – 64<br>2 – 250<br>3 – 64                                         | CE        | O       | Diagnosis Code      | See OBR-31<br><b>Inbound:</b><br>- Update study reason if Accession Number (FT1.23) is provided.<br>- If Procedure Code is provided (FT1-25), update the DxMapping for this procedure.<br><b>Outbound:</b><br>- Sends dxMapping diagnosis codes if the study procedure code (FT1-25) has added dxMapping.<br>- Sends study diagnosis codes if the study procedure code (FT1-25) does not have dxMapping and study has diagnosis codes.                |
| 20  | 1 – 16<br>2 – 64<br>3 – 64<br>4 – 64<br>5 – 64<br>6 – 64<br>14 – 64 | XCN       | O       | Performed By Code   | Reading Physician<br>1 – ID Number<br><b>Outbound:</b> Sends physician's NPI<br>2 – Family Name (0008,1060)<br>3 – Given Name (0008,1060)<br>4 – Middle Name (0008,1060)<br>5 – Suffix (0008,1060)<br>6 – Prefix (0008,1060)<br>14 – Assigned Facility<br><b>Inbound:</b> Only update Physician's facility if the facility is registered in our system and is associated with the physician.<br><b>Outbound:</b> Sends Physician's assigned facility. |
| 21  | 1 – 16<br>2 – 64<br>3 – 64<br>4 – 64<br>5 – 64<br>6 – 64<br>14 – 64 | XCN       | O       | Ordered By Code     | Referring Physician<br>See PV1-9                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 23  | 16                                                                  | EI        | O       | Filler Order Number | Accession Number (0008,0050)                                                                                                                                                                                                                                                                                                                                                                                                                          |

|    |                             |    |   |                         |                                                                                                                                        |
|----|-----------------------------|----|---|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 25 | 1 – 64<br>2 – 250<br>3 – 64 | CE | O | Procedure Code          | 1 – Procedure Code (0008,1032)<br>2 – Procedure Description (0008,1032)<br>3 – Procedure Coding System                                 |
|    |                             |    |   |                         | <b>Inbound:</b><br>- Only update if Accession Number (FT1-23) is provided.<br><b>Outbound:</b><br>Sends only one study procedure code. |
| 26 | 1 – 80                      | CE | O | Procedure Code Modifier | – Procedure Code Modifier<br>Multiple modifiers are sent delimited with ~ character                                                    |

## 6.21 DG1

The diagnosis segment (DG1) contains patient diagnosis information.

| Seq | Length                      | Data Type | Outbound | Description             | Component, Database and DICOM Mapping                                                                                                                                        |
|-----|-----------------------------|-----------|----------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4                           | SI        | R        | Set ID – DG1            | Sequential number for each DG1 segment                                                                                                                                       |
| 2   | 1                           | ID        | R        | Diagnosis Coding Method | FIXED Value = 1 (Required Element for MU)                                                                                                                                    |
| 3   | 1 – 64<br>2 – 250<br>3 – 64 | CE        | R        | Diagnosis Code          | 1 – Identifier<br><b>Outbound:</b> Diagnosis code<br>2 – Text<br><b>Outbound:</b> Diagnosis code description<br>3 – Name of Coding System<br><b>Outbound:</b> 'I9CDX', 'I10' |
| 5   | 26                          | TS        | C        | Diagnosis Date/Time     | Date and time diagnosis was entered                                                                                                                                          |
| 6   | 2                           | IS        | C        | Diagnosis Type          | <b>Outbound:</b> 'W'                                                                                                                                                         |

## 6.22 PR1

The procedures segment (PR1) contains procedures information.

| Seq | Length            | Data Type | Outbound | Description                     | Component, Database and DICOM Mapping    |
|-----|-------------------|-----------|----------|---------------------------------|------------------------------------------|
| 1   | 64                | SI        | R        | Set ID – PR1                    | Get from Generator                       |
| 2   | 3                 | IS        | R        | RamSoft Procedure Coding Method | 'CPT-4'                                  |
| 3   | 1 – 64<br>2 – 250 | CE        | R        | Procedure Code                  | 1- Procedure code name<br>2- Description |
| 4   | 250               | CE        | O        | Procedure Description           |                                          |
| 5   | 26                | TS        | R        | Procedure Date/Time             | Study date time                          |
| 6   | 2                 | IS        | R        | Procedure Functional Type       | 'D'                                      |
| 7   | 4                 | NM        | O        | Procedure Minutes               |                                          |

| Seq | Length                                                   | Data Type | Outbound | Description               | Component, Database and DICOM Mapping                                                                                                                                              |
|-----|----------------------------------------------------------|-----------|----------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8   | 120                                                      | XCN       | O        | Anesthesiologist          |                                                                                                                                                                                    |
| 9   | 2                                                        | IS        | O        | Anesthesia Code           |                                                                                                                                                                                    |
| 10  | 4                                                        | NM        | O        | Anesthesia Minutes        |                                                                                                                                                                                    |
| 11  | 120                                                      | XCN       | O        | Surgeon                   |                                                                                                                                                                                    |
| 12  | 1 – 16<br>2 – 64<br>3 – 64<br>4 – 64<br>5 – 64<br>6 – 64 | CM        | O        | Procedure Practitioner    | Reading Physician<br>1 – ID Number<br>2 – Family Name (0008,1060)<br>3 – Given Name (0008,1060)<br>4 – Middle Name (0008,1060)<br>5 – Suffix (0008,1060)<br>6 – Prefix (0008,1060) |
| 13  | 60                                                       | CE        | O        | Consent Code              |                                                                                                                                                                                    |
| 14  | 2                                                        | NM        | O        | Procedure Priority        | Number of study procedures<br>0 – Admitting Proc.<br>1 – Primary Proc.<br>2 and higher – Secondary Proc.                                                                           |
| 15  | 80                                                       | CE        | O        | Associated Diagnosis Code | Diagnosis Array of: Diagnosis<br>Code^DiagnosisDescription                                                                                                                         |
| 16  | 80                                                       | CE        | O        | Procedure Code Modifier   | Sequence of Modifier if Modifier exists                                                                                                                                            |

## 6.23 RXA

The pharmacy/treatment administration segment (RXA) contains vaccine details.

| Seq | Length                      | Data Type | Outbound | Description                       | Component, Database and DICOM Mapping                                                                                                                                                                              |
|-----|-----------------------------|-----------|----------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4                           | NM        | R        | Give Sub-ID Counter               | '0'                                                                                                                                                                                                                |
| 2   | 4                           | NM        | R        | Administration Sub-ID Counter     | '1'                                                                                                                                                                                                                |
| 3   | 26                          | TS        | R        | Date/Time Start of Administration | Date vaccine was administered                                                                                                                                                                                      |
| 4   | 26                          | TS        | R        | Date/Time End of Administration   | We copy <i>RX43</i>                                                                                                                                                                                                |
| 5   | 1 – 5<br>2 – 250<br>3 – 80  | CE        | R        | Administered Code                 | 1 – Identifier<br>2 – Text<br>3 – Name of Coding System<br><a href="https://www2a.cdc.gov/vaccines/iis/iisstandards/vaccines.asp?rpt=cvx">https://www2a.cdc.gov/vaccines/iis/iisstandards/vaccines.asp?rpt=cvx</a> |
| 6   | 4                           | NM        | R        | Administered Amount               | Quantity of vaccine administered                                                                                                                                                                                   |
| 7   | 1 – 32<br>2 – 250<br>3 – 80 | CE        | R        | Administered Units                | 1 – Identifier<br>2 – Text<br>3 – Name of Coding System 'ISO+'                                                                                                                                                     |
| 15  | 64                          | ST        | R        | Substance Lot Number              | Lot number of vaccine                                                                                                                                                                                              |
| 17  | 1 – 32<br>2 – 128<br>3 – 80 | CE        | R        | Substance Manufacturer Name       | 1 – Identifier<br>2 – Text<br>3 – Name of Coding System<br><a href="https://www2a.cdc.gov/vaccines/iis/iisstandards/vaccines.asp?rpt=mvx">https://www2a.cdc.gov/vaccines/iis/iisstandards/vaccines.asp?rpt=mvx</a> |
| 21  | 2                           | ID        | R        | Action Code                       | 'A'                                                                                                                                                                                                                |

## 6.24 MFI

The master file identification segment (MFI) contains master file identification information.

| Seq | Length | Data Type | Inbound | Description            | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----|--------|-----------|---------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 3      | CE        | O       | Master File Identifier | <b>'PRA'</b> : Practitioner master file<br><b>'CDM'</b> : Charge description master file<br><b>'CMA'</b> : Clinical study with phases and scheduled master file<br><b>'CMB'</b> : Clinical study without phases but with scheduled master file<br><b>'LOC'</b> : Location master file<br><b>'OMA'</b> : Numerical observation master file<br><b>'OMB'</b> : Categorical observation master file<br><b>'OMC'</b> : Observation batteries master file |

| Seq | Length | Data Type | Inbound | Description                        | Component, Database and DICOM Mapping                                                                          |
|-----|--------|-----------|---------|------------------------------------|----------------------------------------------------------------------------------------------------------------|
|     |        |           |         |                                    | <b>'OMD'</b> : Calculated observations master file<br><b>'STF'</b> : Staff master file<br>Default value: 'PRA' |
| 2   | 64     | HD        | O       | Master File Application Identifier | <b>Outbound:</b> 'RAMSOFT'                                                                                     |
| 3   | 3      | ID        | O       | File-Level Event Code              | <b>Outbound:</b> 'UDP'                                                                                         |
| 5   | 26     | TS        | O       | Effective Date/Time                | Current date and time                                                                                          |
| 6   | 2      | ID        | O       | Response Level Code                | <b>Outbound:</b> 'NE'                                                                                          |

## 6.25 MFE

The master file entry segment (MFE) contains master file entry information.

| Seq | Length | Data Type | Inbound | Description             | Component, Database and DICOM Mapping                                                                                                           |
|-----|--------|-----------|---------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 3      | ID        | R       | Record-Level Event Code | <b>'MAD'</b> : add a new user<br><b>'MUP'</b> : update an existing user<br><b>'MDC'</b> : Deactivate a user<br><b>'MAC'</b> : Reactivate a user |
| 2   | 18     | ST        | O       | Message Control ID      | <b>Outbound:</b><br>- We copy <i>MSH.10</i>                                                                                                     |
| 3   | 26     | TS        | O       | Effective Date/Time     | Current date and time                                                                                                                           |

## 6.26 STF

The staff identification segment (STF) identifies any personnel in the system.

| Seq | Length                               | Data Type | Inbound | Description                        | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                       |
|-----|--------------------------------------|-----------|---------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   |                                      | CE        | C       | Provider Code (Only for providers) | Empty                                                                                                                                                                                                                                                                                                       |
| 2   | 16                                   | CX        | C       | Staff Identifier List              | User Id                                                                                                                                                                                                                                                                                                     |
| 3   | 1-64<br>2-64<br>3-64<br>4-64<br>5-64 | XPN       | R       | Staff Name                         | 1-Last name – Required and validation performed, if no last name is received, the message will be rejected.<br>2-First name – Optional<br>3-Middle name – Optional<br>4-Suffix – Optional<br>5-Prefix – Optional<br><br><b>Inbound:</b> based on the system config "Allow Case Sensitive Person Name" value |

| Seq | Length                                         | Data Type | Inbound | Description                    | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                              |
|-----|------------------------------------------------|-----------|---------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                |           |         |                                | - If it is false, stored with upper case<br>- Otherwise, stored as original values                                                                                                                                                                                                                                                 |
| 4   | 64                                             | IS        | R       | Staff Type (Role Name)         | <b>Outbound:</b><br>- By default, User Role Name is populated.<br>- For external system, the outbound value is customized:<br>+ If the user has role of reading physician or performing physician, set to 'PRO'.<br>+ Otherwise, set to 'BIL'.                                                                                     |
| 5   | 1                                              | IS        | C       | Administrative Sex             | 'M': Male<br>'F': Female<br>'O': Other                                                                                                                                                                                                                                                                                             |
| 6   | 26                                             | TS        | O       | Date/Time of Birth             | Birthday                                                                                                                                                                                                                                                                                                                           |
| 7   | 1                                              | ID        | R       | Active/Inactive Flag           | 'A': active user<br>'I': inactive user<br>Note: For MAD (new user) we set to Active, for MUP, if no status received, we will observe the current status of the user.                                                                                                                                                               |
| 8   | 1 – 16<br>2 – 64                               | CE        | O       | Department                     | 1-Internal Facility ID<br>2-Facility Name<br>One user could have multiple facilities.<br>Please be aware that STF.8 is repeatable field                                                                                                                                                                                            |
| 10  | 1 – 64<br>3 – 64                               | XTN       | O       | Phone                          | 1 – Phone Number<br>3 – Identifier<br>Valid values are:<br>'O' – Office / Business<br>'C' – Cell<br>'B' – Beeper / Pager<br>'F' – FAX<br><b>Inbound:</b> Only update if identifier is recognized and a valid phone number is received. We ignore all other values inbound.<br><br>Please be aware that STF.10 is repeatable field. |
| 11  | 1 – 256<br>3 – 24<br>4 – 3<br>5 – 10<br>6 – 16 | XAD       | O       | Office/Home Address/Birthplace | 1-User address<br>3-City<br>4-State<br>5-Zip<br>6-Country                                                                                                                                                                                                                                                                          |
| 15  | 64                                             | ST        | O       | Email address                  | Email address                                                                                                                                                                                                                                                                                                                      |
| 18  | 256                                            | ST        | O       | Job title                      | 1 – User notes                                                                                                                                                                                                                                                                                                                     |

## 6.27 PRA

The practitioner detail segment (PRA) contains user group information and practitioner license information.

| Seq | Length                                            | Data Type | Inbound | Description         | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----|---------------------------------------------------|-----------|---------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2   | 64                                                |           | O       | Group Name          | User Group Name<br><b>Outbound:</b><br>- By default, User Group Name is populated.<br>- For external system, this value is empty, but is required inbound to add users.                                                                                                                                                                                                                                                                                                   |
| 6   | 1 – 30<br>2 – 3<br>3 – 2<br>6 – 2<br>with repeats |           | O       | License Information | <b>Inbound and Outbound:</b><br>1 – License #<br>2 – Type of license<br>We support the following types:<br>'DEA' – Drug Enforcement Agency<br>'SL' – State License<br>'NPI' – Unique Physician ID<br><br>3 – Licensing State (applies to SL only)<br>6 – Licensing Country (applies to SL only)<br><br>This sequence repeats. DEA is expected in first subcomponent, state license is expected in the second subcomponent, and NPI is expected in the third subcomponent. |

## 6.28 ZLI

The ZLI segment contains user account information.

| Seq | Length | Data Type | Inbound | Description | Component, Database and DICOM Mapping                                                                                                                                                                                                                                     |
|-----|--------|-----------|---------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 64     |           | R       | Username    | Username                                                                                                                                                                                                                                                                  |
| 2   | 128    |           | R       | Password    | Password hash key                                                                                                                                                                                                                                                         |
| 3   | 64     |           | O       | SALT        | SALT key<br><b>Inbound:</b><br>- If SALT is present, insert/update user password with SALT.<br>- Otherwise:<br>+ Do not update user password if the user exists in DB.<br>+ If the user does not exist, insert default user password to add new user.<br><b>Outbound:</b> |

| Seq | Length | Data Type | Inbound | Description | Component, Database and DICOM Mapping                                                                                                                                                  |
|-----|--------|-----------|---------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |        |           |         |             | <ul style="list-style-type: none"> <li>- SALT is present when sending between two RamSoft systems.</li> <li>- When sending to external systems, SALT is not present.</li> </ul>        |
| 4   | 64     |           | R       | Group Name  | User Group Name<br><b>Outbound:</b> <ul style="list-style-type: none"> <li>- By default, User Group Name is populated.</li> <li>- For external system, this value is empty.</li> </ul> |

## 6.29 SPM

The SPM segment contains specimen information.

| Seq | Length                     | Data Type | Inbound | Description                   | Component, Database and DICOM Mapping                                                                                                                                                                                                                                     |
|-----|----------------------------|-----------|---------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   |                            | SI        | R       | Set ID SPM                    | Shall be valued sequentially starting the value '1' within a given segment                                                                                                                                                                                                |
| 4   | 1 – 16<br>2 – 64<br>3 – 80 | WE_CR     | R       | Specimen type                 | 1- Identifier (is used if Name of Coding System is SCT)<br>2- Text (is used if Name of Coding System is SCT)<br>3- Name of Coding System<br><b>Inbound:</b> SCT<br>4- Alternate Identifier<br>5- Alternate Text<br>6- Name of Alternate Coding System<br>9- Original Text |
| 17  | 1 – 26<br>2 – 26           | DR        | R       | Specimen Collection Date/Time | 1- Range Start Date/Time (Required)<br>Must match OBR.17 and OBX.14<br>2- Range End Date/Time (Optional)<br>Must match OBR.18                                                                                                                                             |
| 21  | 9 – 250                    | CWE       | Varies  | Specimen Reject Reason        | 1- Identifier<br>2- Text<br>3- Name of Coding System<br>4- Alternate Identifier<br>5- Alternate Text<br>6- Name of Alternate Coding System<br>9- Original Text                                                                                                            |
| 24  | 9 – 250                    | CWE       | Varies  | Specimen Condition            | 1- Identifier<br>2- Text<br>3- Name of Coding System<br>4- Alternate Identifier<br>5- Alternate Text<br>6- Name of Alternate Coding System<br>9- Original Text                                                                                                            |

### 6.30 ACC

The ACC segment contains accident and workman information.

| Seq | Length           | Data Type | Outbound | Description                    | Component, Database and DICOM Mapping                                                              |
|-----|------------------|-----------|----------|--------------------------------|----------------------------------------------------------------------------------------------------|
| 1   | 16               | TS        | C        | HL7 Accident Date/Time         | Date of injury                                                                                     |
| 2   | 1 – 16<br>2 – 64 | CE        | R        | Accident Code                  | 1. Accident type code: 'AUTO', 'EMP', 'OTH'<br>2. Claim #: Patient insurance coverage ID (Primary) |
| 4   | 16               | CE        | C        | Accident State                 | Insurance coverage place state                                                                     |
| 5   | 1                | ID        | R        | Accident Job Related Indicator | 'Y' if accident code is 'EMP'<br>Otherwise, 'N'                                                    |

### 6.31 NK1

The next of kin segment (NK1) contains information about the patient's other related parties. RMC allows receiving NK1 segments which contain emergency contact information and sending NK1 which contains guarantor information in VXU message.

| Seq | Length                                         | Data Type | Inbound | Description                        | Component, Database and DICOM Mapping                                                                                                                                                                                                                                                                                    |
|-----|------------------------------------------------|-----------|---------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 4                                              | SI        | R       | Set ID – NK1                       | Sequential number for each NK1 segment                                                                                                                                                                                                                                                                                   |
| 2   | 1 – 64<br>2 – 64<br>3 – 64<br>4 – 64<br>5 – 64 | CE        | R       | Patient's other related party name | Contact Name<br>1 – Family Name<br>2 – Given Name<br>3 – Middle Name<br>4 – Suffix<br>5 – Prefix<br><b>Inbound:</b><br>- Update patient's emergency contact name<br><b>Outbound:</b><br>- Send patient's guarantor name                                                                                                  |
| 3   | 64                                             | TS        | R       | Relationship                       | Patient's Contact's Relationship<br>'SEL' – 'SELF'<br>'SPO' – 'SPOUSE'<br>'CHD' – 'CHILD'<br>'OTH' – 'OTHER'<br>'PAR' – 'PARENT/GUARDIAN'<br><b>Inbound:</b><br>- All other values will be stored as 'OTHER'<br>- Update patient's emergency contact relation<br><b>Outbound:</b><br>- Send patient's guarantor relation |
| 4   | 1 – 256<br>3 – 24<br>4 – 3<br>5 – 10           | XAD       | O       | Address                            | Contact Address<br>1 – Street Address<br>3 – City<br>4 – State/Province                                                                                                                                                                                                                                                  |

| Seq | Length | Data Type | Inbound | Description  | Component, Database and DICOM Mapping                                                                                                                                           |
|-----|--------|-----------|---------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | 3-2    |           |         |              | 5 – Zip/Postal Code<br>6 – Country<br><b>Outbound:</b><br>- Send patient's guarantor address                                                                                    |
| 5   | 1-64   | XTN       | O       | Phone Number | Contact Phone Number<br><b>Inbound:</b><br>1 - Update patient's emergency contact phone<br><b>Outbound:</b><br>- Send patient's guarantor phone                                 |
| 7   | 1-64   | CE        | R       | Contact Role | 1 – Contact Role<br>"C" – Emergency Contact<br><b>Inbound:</b><br>- Only process the NK1 segment when the value is "C" and Emergency information is not provided in GT1 segment |

### 6.32 ZVI

The ZVI segment contains dosage information.

| Seq | Length | Data Type | Inbound | Description                     | Component, Database and DICOM Mapping |
|-----|--------|-----------|---------|---------------------------------|---------------------------------------|
| 1   | 32     |           | R       | Dose length product             | Dose Length Product                   |
| 2   | 32     |           | R       | Dose Index                      | CT Dose Index                         |
| 3   | 32     |           | R       | Processed mSV or effective dose | Effective Dose                        |

### 6.33 AUT

The authorization information segment (AUT) contains the study's authorization information.

| Seq | Length | Data Type | Inbound | Description                  | Component, Database and DICOM Mapping                                                                                                        |
|-----|--------|-----------|---------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 4   | 26     | TS        | O       | Authorization start datetime | Study's Authorization Start Datetime<br><b>Inbound:</b><br>- Update study's authorization start date/time.<br>- If it is empty, use IN1-14.2 |
| 5   | 26     | TS        | O       | Authorization end datetime   | Study's Authorization End Datetime<br><b>Inbound:</b><br>- Update Study's Authorization End Datetime if it is present.                       |
| 6   | 64     | CM        | O       | Authorization Number         | Study's Authorization Number<br><b>Inbound:</b><br>- Update study's authorization number.<br>- If it is empty, use IN1-14.1                  |

## 6.34 PRB

The problem detail segment (PRB) contains the data necessary to add, update, correct, and delete the problems of a patient.

| Seq | Length            | Data Type | Inbound | Description                | Component, Database and DICOM Mapping       |
|-----|-------------------|-----------|---------|----------------------------|---------------------------------------------|
| 2   | 26                | TS        | O       | Problem Modified Date/Time | Patient's Problem Modified Date/Time        |
| 3   | 1 – 64<br>2 – 250 | CE        | R       | Patient's Problem Code     | 1 – Problem Code<br>2 – Problem Description |
| 7   | 26                | TS        | R       | Problem Date/Time          | Patient's Problem Date/Time                 |

## 7 CONFIGURATION

### 7.1 General Configuration Options

The following options are configurable for the entire Application.

| Parameter                      | Description                                                                                                                                                                        | Default Value |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Debug_Set                      | Debug Option for verbose logging information                                                                                                                                       | true          |
| defaultPatientClass            | 1. Patient Class in case Patient Class is not supplied in Inbound Message.<br>2. Patient Class in Outbound Message if Patient Class is not filled by GUI. (Sent in <i>PV1-2</i> ). | 'O'           |
| RS_Append_Delimiter_Char       | Concatenation Character for clinical notes, comments, symptoms in Study                                                                                                            | '\\'          |
| defaultIssuerName              | Default Issuer of Patient ID if none is received as described in PID segment                                                                                                       | 'UNKNOWN'     |
| RS_PCM                         | RamSoft Procedure Coding Method                                                                                                                                                    | 'CPT-4'       |
| RS_Max_Output_ConsPhy          | The number of consulting physicians is allowed to send                                                                                                                             | 50            |
| RS_IsLimit_Output_ConsPhy      | Allow to send limit number of consulting physicians. If it is true, send the number as configured in RS_Max_Output_ConsPhy. Otherwise, all consulting physicians are sent.         | True          |
| Enable_Check_Mirth_Queue_Stuck | Allow to check if a Mirth record is stuck at least "Mirth_Queue_Max_StuckTime" in minutes. If so, perform restarting Mirth                                                         | True          |
| Mirth_Queue_Max_StuckTime      | The maximum duration that a record can stay in the MIRTH HL7 QUEUE table                                                                                                           | 5             |

## 7.2 Inbound Channel Options

The following options are configurable.

| Parameter                       | Description                                                                                                                                                         | Default Value                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CREATE_NEW_PATIENT ORM_MESSAGE  | Creates new patient records, as needed, when processing ORM messages                                                                                                | true                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| CREATE_NEW_PATIENT_ORU_MESSAGE  | Creates new patient records, as needed, when processing ORU messages                                                                                                | true                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| CREATE_NEW_STUDY ORM_MESSAGE    | Creates new study records, as needed, when processing ORM messages                                                                                                  | true                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| CREATE_NEW_STUDY_ORU_MESSAGE    | Creates new study records, as needed, when processing ORU messages                                                                                                  | true                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| ENABLE_APPEND_OF_SYMPTOMS       | Appends Symptoms received in new ORM or ORU messages to the existing Symptoms. Symptoms are separated with RS_Append_Delimiter_Char defined above                   | true                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| ENABLE_APPEND_OF_COMMENTS       | Appends Comments received in new ORM or ORU messages to the existing Comments. Comments are separated with RS_Append_Delimiter_Char defined above                   | true                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| ENABLE_APPEND_OF_CLINICAL_NOTES | Appends Clinical Notes received in new ORM or ORU messages to the existing Clinical Notes. Clinical Notes are separated with RS_Append_Delimiter_Char defined above | true                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| REPORT_CONTENT_TYPE             | Define Content Type of the report when storing report into Database. This value is used if <i>OBX 3-2</i> is not a supported content type.                          | Default Value is 2 (Text Format)<br>Possible values as following:<br>RS_REPORT_CONTENT_TYPE_PDF – 1<br>Note: PDF is not supported for Diagnostic Reports (Type 1) inbound<br>RS_REPORT_CONTENT_TYPE_TXT – 2<br>RS_REPORT_CONTENT_TYPE_DOC – 3<br>RS_REPORT_CONTENT_TYPE_DOCX – 4<br>RS_REPORT_CONTENT_TYPE_HTML – 5<br>RS_REPORT_CONTENT_TYPE_JPG – 6<br>RS_REPORT_CONTENT_TYPE_TIFF – 7<br>RS_REPORT_CONTENT_TYPE_RTF – 8<br>RS_REPORT_CONTENT_TYPE_DOCM – 9 |

| Parameter                         | Description                                                                      | Default Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REPORT_DOCUMENT_TYPE_ID           | Define Document Type of the report when storing report into Database.            | Default Value is 1 (Diagnostic Report)<br>Main Possible values as following:<br>RS_DIAGNOSTIC_REPORT – 1<br>RS_DIAGNOSTIC_PRELIMINARY -90000<br>RS_ADMIN - 90001<br>RS_CLINICAL - 90002<br>RS_STUDY_FORM – 90003<br>RS_INSTRUCTION – 90004<br>RS_MAMMO – 90005<br>RS_RIS – 90006<br>RS_RX – 90007<br>RS_SCREENING – 90008<br>RS_REFERRAL – 90009<br>RS_INSURANCE_CARD – 91001<br>RS_PATIENT_FORMS – 91002<br>RS_LABS – 91003<br>RS_PATIENT_REGISTRATION_FORM – 91004<br>RS_PATIENT_INSURANCE_CARDS – 91005<br>RS_HIPAA_CONSENT_FORM – 91006<br>RS_MEDICAL_RECORDS_RELEASE_FORM – 91007<br>RS_PRIOR_REPORT – 91008<br>MAMMO_PATIENT_REMINDER_LETTER – 90010<br>MAMMO_REFERRER_REMINDER_LETTER – 90011<br>MAMMO_PATIENT_LAY_LETTER – 90012<br>MAMMO_REFERRER_LAY_LETTER - 90013<br>RS_SURGERY_CONSULTATION_REPORT – 99999 |
| REPORT_DOCUMENT_TITLE             | Define Report Document Title                                                     | By default, diagnostic report title will be set automatically.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| REPORT_TEMPLATE_URL               | Define Report Document Template to view text report in DOC, DOCX or DOCM Format. | By default no template is used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| ALLOW_DISTRIBUTION_REPORT         | Allow to distribute HL7 Received Report                                          | By default, do not distribute the report                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| REPORT_ENCODING                   | Allow to define how to receive a report                                          | Default value is 0<br>Main Possible values as following:<br>0 – perform unescaping HL7 characters and no decode for TXT, HTML, RTF. Decode for other report types.<br>1 – perform decoding for all report types                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| UPDATE_STUDY_DEMOGRAPHICS_MESSAGE | Updates study info, as needed, when receiving ORM, ORU messages                  | true                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| UPDATE_VISIT_DEMOGRAPHICS_MESSAGE | Updates study visit, as needed, when receiving ORM, ORU messages                 | True                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| UPDATE_PROBLEMCODES_MESSAGE       | Allows to update patient's problem code when receiving ADT messages              | False                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Parameter                          | Description                                                                 | Default Value |
|------------------------------------|-----------------------------------------------------------------------------|---------------|
| DELETE_PROBLEMCODES_MESSAGE        | Allows to delete existing patient's problem code when updating problem code | False         |
| ALLOW_DUPLICATE_SIGNED_ORU_INBOUND | Allows to create a duplicate report, as needed, when receiving ORU messages | True          |

### 7.3 Outbound Channel Options

The following options are configurable for each outbound channel.

| Parameter                                         | Description                                                             | Default Value                     |
|---------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------|
| IS_IHE_IMAGEMANAGER                               | Disable ADT and BAR messages to comply with IHE Image Manager Actor     | false                             |
| DEFAULT_SENDING_APPLICATION                       | Sending Application                                                     | 'RAMSOFT'<br>Sent in <i>MSH-3</i> |
| DEFAULT_SENDING_FACILITY                          | Sending Facility                                                        | 'RAMSOFT'<br>Sent in <i>MSH-4</i> |
| DEFAULT_RECEIVING_APPLICATION                     | Receiving Application                                                   | 'RAMSOFT'<br>Sent in <i>MSH-5</i> |
| DEFAULT_RECEIVING_FACILITY                        | Receiving Facility                                                      | 'RAMSOFT'<br>Sent in <i>MSH-6</i> |
| DEFAULT_HL7_VERSIONID                             | HL7 Version ID                                                          | '2.3.1'<br>Sent in <i>MSH-12</i>  |
| ALLOW_SEND_FINANCIAL_SEGMENTS_ADT_OUTBOUND        | Sends GT1 and IN1 segments in ADT^A08 message                           | False                             |
| ALLOW_SEND_EVENT_SEGMENT_OUTBOUND                 | Sends EVN segments in all messages                                      | True                              |
| ALLOW_SEND_FINANCIAL_SEGMENTS_DFT_OUTBOUND        | Sends GT1 and IN1 segments in DFT^P03 message                           | True                              |
| ALLOW_SEND_DG1_SEGMENT_ADT_OUTBOUND               | Sends DG1 segment in ADT message                                        | False                             |
| ALLOW_SEND_OBX_WEIGHT_HEIGHT_SEGMENT ORM_OUTBOUND | Sends OBX Height and Weight segments in ORM message                     | False                             |
| ALLOW_SEND_OBX_WEIGHT_HEIGHT_SEGMENT ORU_OUTBOUND | Sends OBX Height and Weight segments in ORU message                     | False                             |
| ALLOW_SEND_UTC_OFFSET_OUTBOUND                    | Sends UTC offset in outbound messages                                   | True                              |
| ALLOW_SEND_DG1_SEGMENT ORM_ORU_DFT_OUTBOUND       | Allow adding the segment DG1 to outbound ORM and ORU message.           | False                             |
| ALLOW_SEND_INACTIVE_INSURANCES_OUTBOUND           | Allow adding the segment IN1 with INACTIVE status to outbound messages. | True                              |
| ALLOW_SEND_PR1_SEGMENT_DFT_OUTBOUND               | Allow adding the segment PR1 to outbound DFT message.                   | False                             |
| ALLOW_SEND_AUT_SEGMENT ORM_ORU_DFT_OUTBOUND       | Allow adding the segment AUT to outbound ORM, ORU, DFT messages         | False                             |
| ALLOW_SEND_PRB_SEGMENT_ADT_OUTBOUND               | Allow adding the segment PRB to outbound ADT messages                   | False                             |
| ALLOW_SEND_PRB_SEGMENT ORM_ORU_DFT_OUTBOUND       | Allow adding the segment PRB to outbound ORM, ORU, DFT messages         | False                             |
| ALLOW_SEND_UNSIGNED_DIAGNOSTIC                    | Allow Unsigned Diagnostic report to be sent in Outbound ORU^R01 message | False                             |

| Parameter                     | Description                                                                 | Default Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DOCUMENT_OUTPUT_TYPE          | Sets Content Type of the report when retrieving report from Database.       | Default Value is 25 (Text)<br><br>Possible values as following:<br>RS_rxtNative - 0 (In this case report is retrieved in existing format of the record)<br>RS_rxtNative – 0<br>RS_rxtPDF – 1<br>RS_rxtDOC - 5<br>RS_rxtDOCBody – 10<br>RS_rxtRTF - 15<br>RS_rxtRTFBody – 20<br>RS_rxtTextBody – 25<br>RS_rxtChartScriptXML – 30<br>RS_rxtChartScriptXMLRTF – 35<br>RS_rxtChartScriptXMLASCII – 40<br>RS_rxtDOCX - 45<br>RS_rxtDOCXBody - 50<br>RS_rxtHTML - 55<br>RS_rxtJPEG - 60<br>RS_rxtBMP – 65<br>RS_rxtTIFF - 70<br>RS_rxtDOCM – 75 |
| ALLOWED_OUTPUT_DOCUMENT_TYPES | Sets string array of document types to be sent in Outbound ORU^R01 message. | (1,90000)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| OBX_SEGMENT_SIZE              | Sets maximum size of OBX Segment                                            | 65536 (HL7 Standard)<br>If the document format is plain text, RTF, or HTML, word wrapping will be performed so that segments are not broken in the middle of a word unless the word exceeds the segment size.                                                                                                                                                                                                                                                                                                                             |
| OBX_SPLIT_DELIMITERS          | Sets delimiter characters for outbound plain text OBX Segment.              | Default: NULL<br>A new OBX segment is created each time a delimiter character is encountered in the report text.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| OBX_LINEBREAK                 | Sets string to send a line break in a plain text OBX Segment                | Default: '\.br\'<br>Set this to NULL to create a new segment instead of sending a line break string. Typical line break strings are '~', '\E\n', '\X0D\'                                                                                                                                                                                                                                                                                                                                                                                  |
| REPORT_ENCODING               | Allow to define how to send a report                                        | Default value is 0<br>Main Possible values as following:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Parameter          | Description                                                                            | Default Value                                                                                                                                                                                                                                                                          |
|--------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                                                                                        | 0 – perform escaping HL7 characters and no encode for TXT, HTML, RTF. Encode for other report types.<br>1 – perform encoding for all report types<br>2 – perform no escaping, no encoding and only replace the character ' ' by ' ' for TXT, HTML, RTF. Encode for other report types. |
| SEND_ENTIRE_REPORT | Controls whether to send the entire report for an addendum or just the amended portion | False                                                                                                                                                                                                                                                                                  |

## 8 HTTPS FILE TRANSFER SPECIFICATIONS

RMC allows to send/receive HL7 messages between other system (sites) via HTTPS transport.

The HTTPS request sent to / from RMC needs to follow a simple format

The URL: the URL of the server that receives HTTPS request

The HTTPS body: HL7 message. The HTTPS request body is the HL7 message

The content type: "txt/html; charset=UTF-8". This is configuration header content type of the HTTPS request.

The timeout: The timeout used by HTTPS post in seconds

The attemptToPost: Counter on how many auto re-attempts to HTTP post to perform

The ResponseStr: The response from the Server that HTTPS request is sent to.

Sample of HTTPS POST:

```
URL: https://servername/hl7_https
content-type: text/plain; charset=UTF-8
METHOD: POST
[BODY] // Contain HL7 message
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20150504113934+0700||ORM^O01|132|P|2.3.1|||||UNICODE    UTF-8||
EVN|O01|20150504113934+0700||||
PID|1|P12345^^^ISSUER^MR|P12345^^^ISSUER^MR||PATIENT^TEST^M^DR^MR.|^|19741018|M||2106-
3^WHITE^HL70005|10808  FOOTHILL BLVD^^RANCHO
CUCAMONGA^CA^91730^US||9094815872^^^QA@RAMSOFT.COM^^^|90948158001^^^^^^|UNK|M||12345|286509510||
|2135-2^HISPANIC OR LATINO^HL70189|
PV1|1|O|ER^ER^^MEDICAL
CENTER^^^^ER|||JONES^SAMUEL^M^MD^DR.|^JONES^SAMUEL^M^MD^DR.|^SMITH^JOHN^M^MD^DR~^JONES^
ED^M^MD^DR|||||RAM4|||||||||||||||||0|||||V|
ORC|SC|A123456|A123456||SC||1^^^20110615025434-
0400^^R^^^|20150504113934+0700|HL7MIRTH||JONES^SAMUEL^M^MD^DR.|MEDICAL    CENTER||||MEDICAL    CENTER||
OBR|1|A123456|A123456|^XRAY JAW < 4 VIEWS||20150504113934+0700||||R|Patient was in an
altercation|^JAW^B|JONES^SAMUEL^M^MD^DR.||A123456|RP890|A123456||||CR|||1^^^20110615025434-
0400^^R^^^|WALK|830.1^DISLOCATION OF JAW; OPEN
DISLOCATION|&PATEL&APU&&MD&||&LEVINSON&KERRY&K&RT&|&TRANKLIN&KATY&K&&||||PATIENT    WAS
DRUNK||U||70100^XRAY JAW < 4 VIEWS|23~42~34
NTE|1|O|CLINICAL NOTES|RE
OBX|1|ST|^BODY HEIGHT||1.69|m||||F|||||
OBX|2|ST|^BODY WEIGHT||75|kg||||F|||||
ZDS|1.2.124.113540.0.0.3.725.4^RAMSOFT^Application^DICOM
```

#### 1. RMC's response of the HTTPS request

After sending a HTTPS request to RMC Server, RMC will return a response that includes a custom ACK HL7 message (See Section 0, 0) back with response text message.

- If the HL7 message which is on HTTPS request body is rejected, the response text message is defined as follow and will identified in ERR segment:

```
errorCode = 101;
responsetextMessage = '^'^ + errorCode + '&' + rejectMessage;
```

- If the HL7 message is processed successfully, the response text message is defined as follow and will presented in MSA segment:

```
responsetextMessage = "Request was Successfully processed"
```

- If there is an exception or error, the response text message is defined as follow and will identified in ERR segment

```
errorCode = 207;
errorMessage = 'Application Internal Error';
responsetextMessage = '^'^ + errorCode + '&' + errorMessage;
```

Note:

- ERR segment is defined corresponding to HL7 version 2.3.1

## 9 GOOD TO KNOW

### 9.1 Signature line

Which report types can be received with auto-populated signature line: HTM SR report, TXT report

Criteria required for signature line to appear on inbound report received through ORU: observer name and the observation date and time

HTML Tags within report content that will auto consider the whole report to be HTM:

HTMLParaTag = '</P>';

HTMLFontTag = '</FONT>';

HTMLLineBreakTag = '<BR>';

### 9.2 Write Javascript functions to generate HL7 messages from DBXML

Interface with other vendors requires specific message dependencies. For example, it requires ADT first then ORM and DFT, it should be taken care of by the interface developer. In order to send an ADT message first then ORM or DFT message, we can write Javascript functions to generate messages from our DBXML. These development steps are described in the Mirth Developer Guide.

### 9.3 Create/Edit Addendum report

During creating/editing an Addendum report, the following syntax should not be modified:

1. <Addendum Begin
2. Addendum End>

If there are mistakes, for example, extra spaces between "Addendum" and "Begin", the entire report will be sent instead of just amended part of report when the SEND\_ENTIRE\_REPORT option is set to "false".

```
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20151016183523+0700||ORU^R01|453636|P|2.3.1|||||UNICODE UTF-8||
EVN|R01|20151016183523 +0700|||
PID|1|P11^^^RAMSOFT^MR|P11 ^^RAMSOFT^MR||NO
ALAAC^RAMQQQ^ZQ^^|^|U||UNK^DECLINED^HL70005|^^^^^US||^|UNK^DECLINED^HL70189|
PV1|1|O|^^^^^^^|2015080925^ADMIN^NAME^^^^^^^|2015080925^ADMIN^NAME^^^^^^^|^^^^^^^|RAM830|^^^^^^^|
|||||||||0.00|||||V|
```

```

ORC|SC|RAM521|RAM521||ZW||1  ^^^20151015190  844+0700^^R^^^||201510  16183523  +0700|ADMIN||2015080925^ADMIN^NAME^^
^^^^^^^^^|||||
OBR|1|RAM521|RAM521|1000 ^THIS IS STUDY
1||20151016183523+0700||||R||^BRAIN^B|20  150  80925^ADMIN^NAME^^^^^^^^^||RAM521|521|RAM521|||BDUS|||1  ^^^2015101
5190844+0700^^R^^^||WALK||2015080925&ADMIN&NAME&&&||&&&&&|&&&&&||||U|||19083 ^BIOPSY BREAST 1ST LESION
ULTRASOUND|
NTE|1|O||RE
OBX|1|FT|1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1||<Addendum Begin||||A||||^ADDENDUM
OBX|2|FT|1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1||This is incorrect addendum report when extra spaces
between <Addendum and Begin||||A||||^ADDENDUM
OBX|3|FT|1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1||Addendum End>||||A||||^ADDENDUM
OBX|4|FT|1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1||This is test report||||A||||^ADDENDUM
OBX|5|FT|1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1||||A||||^ADDEN DUM
OBX|6|FT|1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1||||A||||^ADDENDUM

```

Sample correct outbound message when the SEND\_ENTIRE\_REPORT option is set to "false":

```

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|201510 16183427+0700||ORU^R01|453635|P|2.3.1|||||UNICODE UTF -8|
EVN|R01|20151016183427+0700|||
PID|1|P11^^^RAMSOFT^MR|P11  ^^^RAMSOFT^MR||NO
ALAC^RAMQQQ^ZQ^^^|U||UNK^DECLINED^HL70005|^^^^^US|^^^^^^| ^^^^^^|UNK|U|||||UNK^DECLINED^HL70189|
PV1|1|O|^^^^^^^^^|||2015080925^ADMIN^NAME^^^^^^^^^|2015080925^ADMIN^NAME^^^^^^^^^|^^^^^^^^^|RAM830|^^^^^^^^^
|||||||||0.00||||V|
ORC|SC|RAM521|RAM521||ZW||1  ^^^20151015190  844+0700^^R^^^||201510  16183427+0700|ADMIN||201  50  80925^ADMIN^NAME^^
^^^^^^^^^|||||
OBR|1|RAM521|RAM521|1000 ^THIS IS STUDY
1||20151016183427+0700||||R||^BRAIN^B|2015080925^ADMIN^NAME^^^^^^^^^||RAM521|521|RAM521|||BDUS|||1  ^^^20 15101
5190844+0700^^R^^^||WALK||2015080925&ADMIN&NAME&&&||&&&&&|&&&&&||||U|||19083 ^BIOPSY BREAST 1ST LESION
ULTRASOUND|
NTE|1|O||RE
OBX|1|FT|1.2.124.113540.1.4.1462321546.2484.1444994575.945^TXT^^1||<Addendum Begin||||A||||^ADDENDUM
OBX|2|FT|1.2.124.113540.1.4.1462321546.2484.1444994575.945^TXT^^1||This is correct addendum report||||A||||^ADDENDUM
OBX|3|FT|1.2.124.113540.1.4.1462321546.2484.1444994575.945^TXT^^1||Addendum End>||||A||||^ADDENDUM

```

## 10 NORMATIVE REFERENCES

- Health Level Seven, Version 2.3.1, 1999  
<http://www.hl7.org/implement/standards/v2messages.cfm>
- IHE Radiology Technical Framework Revision 10.0, 2011  
[http://www.ihe.net/Technical\\_Framework/index.cfm#radiology](http://www.ihe.net/Technical_Framework/index.cfm#radiology)
- NEMA Digital Imaging and Communications in Medicine (DICOM), Version3 Volumes 1 – 18, 2009  
<ftp://medical.nema.org/medical/dicom/2009/>
- Mirth Connect Reference Guide  
<http://www.mirthcorp.com/community/wiki/display/mirthuserguidev1r8p0/Transformers>

## VERSIONS

| Version | Revision Notes                                                                                                                                                                                                                                                                                                                  | Updated by | Reviewed by | Effective Date |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|----------------|
| Rev. A  | Initial Version for 6.0                                                                                                                                                                                                                                                                                                         | LNO        | SRN, VKM    | 04/14/2015     |
| Rev. B  | Update Section 1.1 for Inbound DFT message<br>Update Section 3.13 for Inbound Processing, DFT-P03 sample message<br>Update Section 4.6 PV1 for PV1.46 Patient Balance, Section 4.20 for Inbound column<br>Add Section 6 for how to structure the message for sending/receiving between RMC and other system via HTTPS transport | LNO        | VKM, SMV    | 05/04/2015     |
| Rev. C  | Add ACC segment into Section 4<br>Update Section 3.13 for DFT messages                                                                                                                                                                                                                                                          | LNO        | SRN         | 06/23/2015     |
| Rev. D  | Add Outbound SIU to Section 1.2 and 3.10<br>Update SCH, AIS, RGS segments<br>Add PID.6 for Mother's Maiden Name to PID segment<br>Update RACE table for PID.10 of PID segment<br>Add IN1.45 for Insurance Verification Status to IN1 segment                                                                                    | LNO        | SRN         | 07/21/2015     |
| Rev. E  | Add the Name of Coding System for Diagnosis code and default value when it is blank for Inbound message                                                                                                                                                                                                                         | LNO        | EMN         | 09/11/2015     |
| Rev. F  | Support referring, reading, consulting's assigned facility<br>Limit number of consulting physicians are sent<br>Add GT1.8 Guarantor Date of Birth<br>Update Sections: 3.2.1, 3.5, 3.6, 3.7, 13.14, 4.6, 4.15, 4.19, 4.20, 4.26, 5.1, 7.2.<br>Add Section 7.3 for Addendum                                                       | LNO        | EMN         | 10/16/2015     |
| Rev. G  | Support receiving/sending any number of diagnosis codes<br>Add status order code 150 – 159 for exam completed<br>Add EVN segment to SIU message<br>Update Section 3.10.3, Section 4.15                                                                                                                                          | LNO        | EMN         | 12/24/2015     |
| Rev. H  | Add Inbound Processing for MFN message<br>Update PID, IN1, MFI, MFE, STF, ZLI segments                                                                                                                                                                                                                                          | LNO        | EMN         | 02/15/2016     |
| Rev. I  | Update 3.14 Vaccination segments and sample VXU^V04 message<br>Add 4.30 NK1 segment<br>Update 4.18 GT1.2 sequence<br>Add 3.13.2: Populate ACC segments corresponds to active insurances<br>Add 4.31 ZVI segment, 4.32 AUT segment, 4.33 PRB segment<br>Update 4.19 Seq 42, 4.18 Seq 20                                          | LNO        | EMN         | 08/23/2016     |

|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |            |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------------|
| Rev J | Update 3.6.3, 3.11 for receiving active and inactive insurances<br>Update 4.10 Seq 18, 29 for processing multiple accession numbers<br>Update 4.17 Seq 3 for Procedure Code and Description<br>Update test SIU messages with SCH.26, SCH.27<br>Updated BAR message with IN1.1<br>Update ORU message (RTF) with PID3.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | LNO | EMN | 09/09/2016 |
| Rev K | Update Section 4.18 GT1.9, Section 4.5 PID.8, Section 4.19 IN1.43 for sex status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | LNO | SMV | 11/04/2016 |
| Rev L | Updated Section 3.6.3 for study types and procedure codes inbound processing changes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | MII | SMV | 1/23/2017  |
| Rev M | Added additional sample messages to Sections 3.6.4 and 3.8.3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | MII | EMN | 3/01/2017  |
| Rev N | Added section header and updated table to reflect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | EMN | MII | 3/23/2017  |
| Rev O | <ul style="list-style-type: none"> <li>- Update allow receiving different types of line break</li> <li>- Update PID.10 for RACE, Ethnicity</li> <li>- Add 2.4 Section for storing value in uppercase or case sensitive</li> <li>- Update 4.5 PID, 4.10 OBR, 4.14 OBX, 4.26 STF for case sensitive</li> <li>- Update 4.14 OBX.11 to allow receiving signed addendum</li> <li>- Update 4.15 SCH and 4.17 AIS for receiving SIU message to update/insert appointment</li> <li>- Update 4.10 OBR for assigned facility for referring physician requires setup as Referring Facility</li> </ul>                                                                                                                                                                                                                                                                                                | LNO | MII | 8/22/2017  |
| Rev P | <ul style="list-style-type: none"> <li>• Updated header and footer.</li> <li>• 4.26 to reflect Last Name is required, first and middle are optional and user status handling.</li> <li>• 4.17.1 COMPLETED to COMPLETE.</li> <li>• 4.10 updated limitation on history and clinical notes.</li> <li>• 4.11 updated limitation on comments.</li> <li>• 4.16 Updated for Resource Name on Inbound</li> <li>• 4.14 to reflect support for Prior Reports and Study Form</li> <li>• 3.81 Handling of text reports when Global and/or Facility templates exist.</li> <li>• 4.1, 4.9 and 4.10 for referring physician assigned facility</li> <li>• 3.5.1 New A23 added</li> <li>• 3.10 Removed EVN segment from table</li> <li>• 3.10.3 Added new sample SIU</li> <li>• 4.21 Added DG1.2</li> <li>• 3 for ACK/NACK</li> <li>• 3.3 for filtering patient IDs that were previously merged</li> </ul> | EMN | MI  | 5/02/2018  |

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|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------------|
|       | <ul style="list-style-type: none"> <li>3.13.1 for financial transaction handling</li> <li>3.8.3 Sample ORUs replaced</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                 |     |     |            |
| Rev Q | <ul style="list-style-type: none"> <li>Section 1 Added TM for Gateway</li> <li>Section 3.3 Added Sample A08 with PRB and DG1 with A08 table updated</li> </ul>                                                                                                                                                                                                                                                                                                                                                                  | EMN | MI  | 5/7/2018   |
| Rev R | <ul style="list-style-type: none"> <li>P 65 typo</li> <li>3.13.1 Ins segs ignored inbound on DFT</li> <li>3.7 Updated MFN</li> <li>4.27 PRA segment added</li> </ul>                                                                                                                                                                                                                                                                                                                                                            | EMN | MI  | 5/10/2018  |
| Rev S | <ul style="list-style-type: none"> <li>Added info for SCH.15 and that dept and room must exist on all segments we map to these values</li> <li>Fixed formatting</li> <li>Added STF.4 and STF.5 for suffix and prefix</li> <li>Modified STF.10 for all supported numbers</li> <li>Added STF.18 for user notes</li> <li>4.19 - IN1.45 only read from DFT</li> </ul>                                                                                                                                                               | EMN | MI  | 5/11/2018  |
| Rev T | <ul style="list-style-type: none"> <li>Replaced ORU RTF/WORD/PDF sample messages with hyperlinks to same messages stored online</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                      | SMV | SMV | 7/30/2018  |
| Rev U | <ul style="list-style-type: none"> <li>Revised document to fit standard product documentation template</li> <li>Edited formatting for consistency</li> </ul>                                                                                                                                                                                                                                                                                                                                                                    | JZG | LHG | 8/3/2018   |
| Rev V | <ul style="list-style-type: none"> <li>Added documentation that PDF is not supported for Diagnostic Reports inbound</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                  | EMN | SM  | 9/21/2018  |
| Rev W | <ul style="list-style-type: none"> <li>Minor spelling mistakes</li> <li>Reviewed documentation for completeness</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                      | SM  | JZG | 12/6/2018  |
| Rev X | <ul style="list-style-type: none"> <li>Update statement in regard to MFN and password exchange</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                       | SM  | LLG | 5/10/2019  |
| Rev Y | <ul style="list-style-type: none"> <li>Added ZA/ZP to ORC-5 status mappings</li> <li>Modified priority in OBR-27 and SCH-11 to mention custom priorities are accepted value</li> <li>Fixed value for guarantor country</li> <li>Modified AIS-4 to reflect appointment date/time</li> <li>Removed all instances of RS_SendEntireReport with SEND_ENTIRE_REPORT and updated description</li> <li>Fixed 'O' in employment status</li> <li>Updated inbound MFI fields to 'O'</li> <li>Updated PRA.2 inbound field to 'O'</li> </ul> | MI  | SM  | 11/09/2021 |
| Rev Z | <ul style="list-style-type: none"> <li>Removed RamSoft Status column from Status Mappings</li> <li>Fixed HTM typo to HTML in inbound/outbound OBX.3.2</li> </ul>                                                                                                                                                                                                                                                                                                                                                                | MI  | SM  | 04/12/2023 |

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| Rev 2.0 | <ul style="list-style-type: none"><li>Removed outbound columns except for outbound only segments</li><li>Fixed formatting</li><li>Fixed typos</li></ul>                                                                                 | MI | SM | 7/25/2024 |
| Rev 2.1 | <ul style="list-style-type: none"><li>Fixed typos</li><li>Added new document types</li></ul>                                                                                                                                            | MI | SM | 5/01/2026 |
| Rev 3.0 | <ul style="list-style-type: none"><li>Added support for the SQM^S25 and QRY^A19 query message types</li><li>Added Technical Environment section</li><li>Added Error Handling &amp; Rejection section</li><li>Fixed formatting</li></ul> | MI | SM | 8/07/2026 |