

Integrating the Healthcare Enterprise



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**IHE Radiology
Technical Framework Supplement**

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**Results Distribution
(RD)**

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Please verify you have the most recent version of this document. See [here](#) for Trial Implementation and Final Text versions and [here](#) for Public Comment versions.

Foreword

30 This is a supplement to the IHE Radiology Technical Framework 15.0. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

This supplement is published on June 21, 2017 for public comment. Comments are invited and can be submitted at [http://www.ihe.net/Radiology Public Comments](http://www.ihe.net/Radiology_Public_Comments). In order to be considered in development of the trial implementation version of the supplement, comments must be
35 received by July 21, 2017.

This supplement describes changes to the existing technical framework documents.

“Boxed” instructions like the sample below indicate to the Volume Editor how to integrate the relevant section(s) into the relevant Technical Framework volume.

<i>Amend Section X.X by the following:</i>
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40 Where the amendment adds text, make the added text **bold underline**. Where the amendment removes text, make the removed text **~~bold strikethrough~~**. When entire new sections are added, introduce with editor’s instructions to “add new text” or similar, which for readability are not bolded or underlined.

45 General information about IHE can be found at www.ihe.net.

Information about the IHE Radiology domain can be found at ihe.net/IHE_Domains.

Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at http://ihe.net/IHE_Process and <http://ihe.net/Profiles>.

50 The current version of the IHE Radiology Technical Framework can be found at http://www.ihe.net/Technical_Frameworks.

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CONTENTS

	Introduction to this Supplement.....	5
65	Open Issues and Questions	5
	Closed Issues	6
	General Introduction	8
	Appendix A - Actor Summary Definitions	8
	Appendix B - Transaction Summary Definitions	8
70	Glossary	8
	Volume 1 – Profiles	9
	X Results Distribution (RD) Profile	10
	X.1 RD Actors, Transactions, and Content Modules.....	10
	X.1.1 Actor Descriptions and Actor Profile Requirements.....	11
75	X.1.1.1 Report Creator	11
	X.1.1.2 Report Manager	11
	X.1.1.3 Report Consumer	11
	X.2 RD Actor Options	11
	X.2.1 Imaging Report as Text Option	12
80	X.2.2 Imaging Report as HL7 CDA Level 1 Option	12
	X.2.3 Imaging Report as HL7 CDA Level 2 Option	12
	X.2.4 Imaging Report as HL7 CDA Level 3 Option	13
	X.3 RD Required Actor Groupings.....	13
	X.4 RD Overview.....	13
85	X.4.1 Concepts	14
	X.4.1.1 Reports versus Results.....	14
	X.4.1.2 Clinical Reporting Guidelines	14
	X.4.1.3 Report Templates and Classification Systems.....	15
	X.4.1.4 Actionable Findings, Timing, and Results Priority	15
90	X.4.1.5 Voice dictation.....	16
	X.4.1.6 Coded Results, Structured and Synoptic Reports	16
	X.4.1.7 Imaging Result Payload Formats.....	17
	X.4.2 Use Cases	17
	X.4.2.1 Use Case 1: Simple case – send imaging results to an EMR	17
95	X.4.2.1.1 Send imaging results to an EMR Use Case Description.....	17
	X.4.2.1.2 Send imaging results to an EMR Process Flow	17
	X.4.2.2 Use Case 2: Non-critical actionable finding trigger	18
	X.4.2.2.1 Non-critical actionable finding trigger Use Case Description.....	18
	X.4.2.2.2 Non-critical actionable finding trigger Process Flow	19
100	X.5 RD Security Considerations	19
	X.6 RD Cross Profile Considerations	20
	Volume 3 – Transactions	21
	4.Y1 Send Imaging Results [RAD-Y1]	21
	4.Y1.1 Scope	21

105	4.Y1.2 Actor Roles.....	21
	4.Y1.3 Referenced Standards.....	22
	4.Y1.4 Interaction Diagram.....	22
	4.Y1.4.1 Send Imaging Results Message.....	22
	4.Y1.4.1.1 Trigger Events.....	22
110	4.Y1.4.1.2 Message Semantics.....	23
	4.Y1.4.1.2.1 Mapping of Priority and Statuses of Findings.....	24
	4.Y1.4.1.2.2 MSH Segment.....	26
	4.Y1.4.1.2.3 EVN Segment.....	26
	4.Y1.4.1.2.4 PID Segment.....	26
115	4.Y1.4.1.2.5 PV1 Segment.....	28
	4.Y1.4.1.2.6 ROL Segment.....	29
	4.Y1.4.1.2.7 ORC Segment.....	30
	4.Y1.4.1.2.8 OBR Segment.....	30
	4.Y1.4.1.2.9 TQ1 Segment.....	34
120	4.Y1.4.1.2.10 OBX Segment - DICOM Study Instance UID.....	35
	4.Y1.4.1.2.11 OBX Segment - Finding.....	36
	4.Y1.4.1.2.12 OBX Segment - Radiologist’s Recommendation.....	38
	4.Y1.4.1.2.13 OBX Segment - Radiologist Requests Consultation.....	40
	4.Y1.4.1.2.14 OBX Segment - Radiologist Requests Feedback.....	40
125	4.Y1.4.1.2.15 OBX Segment - Imaging Result Payload.....	41
	4.Y1.4.1.3 Expected Actions.....	43
	4.Y1.4.2 Send Imaging Results Response Message.....	43
	4.Y1.4.2.1 Trigger Events.....	43
	4.Y1.4.2.2 Message Semantics.....	43
130	4.Y1.4.2.3 Expected Actions.....	44

Introduction to this Supplement

135 The IHE Radiology Results Distribution (RD) Profile sends radiology results, i.e., a radiology report, to existing installed base systems. This profile uses an HL7^{®1} v2.5.1 Observations Results (ORU) message.

The profile began with a narrow focus as a subset of the IHE RAD Follow-up of Non-critical Actionable Findings (FUNC) Profile. As a result, the ORU message is defined with a significant number of structured OBX segments to fulfill all of the FUNC downstream requirements.
140 However, it also became apparent that this message could be used more generally and be grouped with other profiles and actors, hence, it is split into this RD Profile.

Open Issues and Questions

#	Document section	Open Issue
1	X.3 AT diagram	Should this profile include a Report Repository and address archiving of reports? Or limit to transmission.
2	Entire profile	BIG: The original intent of this profile was to focus on pulling the installed base of reporting systems into the world of standardization. However, should this profile focus on the current installed base to drive adoption or focus on fulfilling the strategic vision of ONC including computer process-able report formats? Also see David Clunie's full email on this topic.
3	X.6	Does RAD-Y1 meet the needs of the combinations of the profiles/actors listed in X.6 Cross Profile Considerations? As part of public comment period, take into consideration that this RAD-Y1 transaction was developed initially for FUNC.
4	ROL	P: In RAD-Y1 - In ROLE segment, is the ROL-2 correct as Add?
5	OBR	S: In RAD-Y1, we are putting Accession Number into OBR-18 (Placer Field 1) to mirror RAD-4 (Procedure Scheduled). Is this correct?
6	OBR	T: In RAD-Y1, Laterality has been put into Placer Supplemental Service Information OBR-46 to mirror RAD-4. is that correct?
7	OBR	U: In RAD-Y1, OBR-25 Result Status and OBX says an amendment must include the complete report content, not just the differential. Verify.

¹ HL7 is the registered trademark of Health Level Seven International.

#	Document section	Open Issue
8	OBX	V: In RAD-Y1, for the DICOM Instance OBX, what value should OBX-2 Value Type be? OBX for OID sections RP Reference Pointer is used. See HL7 v2.5.1 Ch 2A page 2-207 - please review. In HL7 v2.6 OBX-21 is Observation Instance Identifier - it is reserved in HL7 v2.5.1. Should we use this for OID/UID?
9		Y: IN RAD-Y1: we need a full example ORU
10		Z: In RAD-Y1: how do we submit mapping ideas from this ORU to the FHIR organization for their mappings page? We do not currently seem to agree on all mappings.
11		AY1: In RAD-Y1: In IHE RAD-4/RAD-13 Procedure Scheduled puts the Study Instance UID into a ZDS segment, however, this is an ORM order message from an Order Filler (RIS). Should we stay consistent with that message or stay consistent within the ORU message as currently defined in RAD-Y1, as it is now? Note that there are not any KNOWN reporting systems using the ZDS segment in ORU (but some may still exist that we do not know about).
12		BY1: IN RAD-Y1 alignment with the FHIR DiagnosticReport resource, should we at least propose to FHIR that they accept our mappings, because right now, that FHIR mapping section appears quite hacked/incomplete. See http://build.fhir.org/diagnosticreport-mappings.html

Closed Issues

145

#	Document section	Open Issue	Resolution to Issue
1	Vol 2	Try to reuse CARD-7 or just create an ORU message?	A: creating new Y1 transaction. Not trying to reuse CARD-7 (MDM).
2	Vol 2	If we use CARD-8 we should use both complete report and by reference, correct? Need to include that somehow.	A: creating new Y1 transaction. Not trying to reuse CARD-7 (MDM) or CARD-8.

#	Document section	Open Issue	Resolution to Issue
3	X.3	<p>Do we need to add another actor -a Report Manager back in and define the HL7 v2.5.1 critical results flag as an option to the follow-up source? This might require a new transaction if we can't find an ORU transaction? (may need to CP that transaction to include HL7 v2 CF element) - see emails from European folks. If we do this, then I also want to include DICOM Part 20 CDA CF flag. (as an option) Is this transaction then required on the Follow-up Source? Separate Use Case B-1 into two use cases then also.</p>	<p>A: Report Manager has been added back into profile based on input from folks in Europe.</p>

General Introduction

Update the following Appendices to the General Introduction as indicated below. Note that these are not appendices to Volume 1.

150 Appendix A - Actor Summary Definitions

Add the following actors to the IHE Technical Frameworks General Introduction list of actors:

Actor	Definition
<u>Report Consumer</u>	<u>A system that can receive radiology imaging results (i.e., reports).</u>
Report Manager	A system that provides management and short-term storage of DICOM Structured Report objects reports during the reporting process then distributes text or structured reports to report repositories or report consumers . It also manages the worklists and status of reporting.
Report Creator	A system that generates and transmits draft (and optionally, final) diagnostic reports, presenting them as DICOM Structured Reporting Objects . It may also retrieve worklist entries for reporting steps from the Report Manager and provide notification of completion of the step, allowing the enterprise to track the status of an awaited report.

Appendix B - Transaction Summary Definitions

155

Add the following transactions to the IHE Technical Frameworks General Introduction list of Transactions:

Transaction	Definition
Send Imaging Results [RAD-Y1]	Transfer imaging results (i.e., radiology reports) using HL7 v2 ORU messages.

Glossary

Add the following glossary terms to the IHE Technical Frameworks General Introduction Glossary:

160

No new glossary terms

Volume 1 – Profiles

165

X Results Distribution (RD) Profile

The IHE Radiology Results Distribution (RD) Profile conveys imaging results using an HL7 v2.5.1 Observation Results (ORU) message.

170 This profile fills a gap in Scheduled Workflow and other IHE Radiology profiles using an ORU message for imaging results, and requires specific information such as actionable finding (critical results) in a well-specified and coded manner. This profile specifies the metadata for imaging results but allows for various results payload formats including plain text, CDA^{®2}, and other formats.

175 Results archiving and persistence, transcoding of results to other formats, results analysis, and report display are out of scope for this profile.

X.1 RD Actors, Transactions, and Content Modules

This section defines the actors, transactions, and/or content modules in this profile. General definitions of actors are given in the Technical Frameworks General Introduction Appendix A at http://ihe.net/TF_Intro_Appendices.

180 Figure X.1-1 shows the actors directly involved in the Results Distribution Profile and the relevant transactions between them.

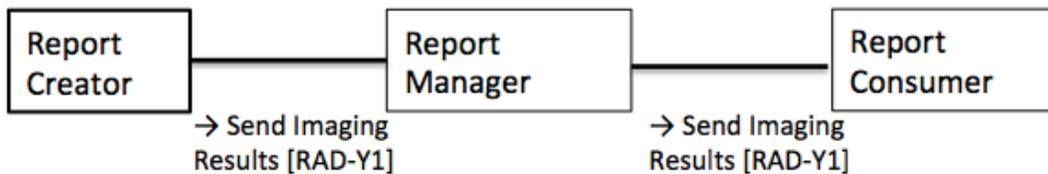


Figure X.1-1: RD Actor Diagram

185 Table X.1-1 lists the transactions for each actor directly involved in the RD Profile. To claim compliance with this profile, an actor shall support all required transactions (labeled “R”) and may support the optional transactions (labeled “O”).

Table X.1-1: RD Profile - Actors and Transactions

Actors	Transactions	Optionality	Reference
Report Creator	Send Imaging Results [RAD-Y1]	R	RAD TF-3: 4.Y1

² CDA is the registered trademark of Health Level Seven International.

Actors	Transactions	Optionality	Reference
Report Manager	Send Imaging Results [RAD-Y1]	R (See Note 1)	RAD TF-3: 4.Y1
Report Consumer	Send Imaging Results [RAD-Y1]	R	RAD TF-3: 4.Y1

190 Note 1: The Report Manager shall be capable of both sending and receiving the Send Imaging Results message.

X.1.1 Actor Descriptions and Actor Profile Requirements

Most requirements are documented in Transactions (Volume 3) and Content Modules (Volume 3). This section documents any additional requirements on profile's actors.

195 X.1.1.1 Report Creator

There are no additional requirements on this actor.

X.1.1.2 Report Manager

There are no additional requirements on this actor.

X.1.1.3 Report Consumer

200 There are no additional requirements on this actor.

X.2 RD Actor Options

Options that may be selected for each actor in this profile, if any, are listed in the Table X.2-1. Dependencies between options when applicable are specified in notes.

205 **Table X.2-1: Results Distribution - Actors and Options**

Actor	Option Name	Reference
Report Creator (Note 1)	Imaging Results as Text	Section X.2.1
	Imaging Results as HL7 CDA Level 1	Section X.2.2
	Imaging Results as HL7 CDA Level 2	Section X.2.3
	Imaging Results as HL7 CDA Level 3	Section X.2.4
Report Manager (Note 2)	Imaging Results as Text	Section X.2.1
	Imaging Results as HL7 CDA Level 1	Section X.2.2
	Imaging Results as HL7 CDA Level 2	Section X.2.3
	Imaging Results as HL7 CDA Level 3	Section X.2.4
Report Consumer (Note 1)	Imaging Results as Text	Section X.2.1
	Imaging Results as HL7 CDA Level 1	Section X.2.2
	Imaging Results as HL7 CDA Level 2	Section X.2.3
	Imaging Results as HL7 CDA Level 3	Section X.2.4

Note 1: The Report Creator and the Report Consumer shall support at least one of the Named Options for the Imaging Results payload format. This option shall be clearly documented in the IHE Integration Statement.

Note 2: The Report Manager shall support all of the Named Options for the Imaging Results payload format. This shall be clearly documented in the IHE Integration Statement.

210 **X.2.1 Imaging Report as Text Option**

This option enables actors to exchange plain text reports.

A Report Creator that supports this option shall create an Imaging Result Payload OBX Segment of type “TX” for “Text Data” as described in RAD TF-3:4.Y1.4.1.2.15.

215 A Report Manager that supports this option shall be able to send and receive an Imaging Result Payload OBX Segment of type “TX” for “Text Data” as described in RAD TF-3:4.Y1.4.1.2.15.

A Report Consumer that supports this option shall be able to properly use an Imaging Result Payload OBX Segment of type “TX” for “Text Data” as described in RAD TF-3:4.Y1.4.1.2.15.

X.2.2 Imaging Report as HL7 CDA Level 1 Option

220 This option enables actors to exchange reports formatted as xml wrapped text as defined by HL7 CDA Level 1. The content of the CDA document shall conform with HL7 v3 CDA Level 1 specifications, or, preferably with DICOM Part 20 “Imaging Reports in HL7 CDA” Level 1 specifications.

225 A Report Creator that supports this option shall create an Imaging Result Payload OBX Segment of type “ED” for “HL7 CDA” or type “RP” for “Reference Pointer” to a Level 1 CDA as described in RAD TF-3:4.Y1.4.1.2.15.

A Report Manager that supports this option shall be able to send and receive an Imaging Result Payload OBX Segment of type “ED” for “HL7 CDA” or type “RP” for “Reference Pointer” to a Level 1 CDA as described in RAD TF-3:4.Y1.4.1.2.15.

230 A Report Consumer that supports this option shall be able to properly use an Imaging Result Payload OBX Segment of type “ED” for “HL7 CDA” or type “RP” for “Reference Pointer” to a Level 1 CDA as described in RAD TF-3:4.Y1.4.1.2.15.

X.2.3 Imaging Report as HL7 CDA Level 2 Option

235 This option enables actors to exchange reports formatted as xml wrapped text with section headers as defined by HL7 CDA Level 2. The content of the CDA document shall conform with HL7 v3 CDA Level 2 specifications, or, preferably with DICOM Part 20 “Imaging Reports in HL7 CDA” Level 2 specifications.

A Report Creator that supports this option shall create an Imaging Result Payload OBX Segment of type “ED” for “HL7 CDA” or type “RP” for “Reference Pointer” to a Level 2 CDA as described in RAD TF-3:4.Y1.4.1.2.15.

240 A Report Manager that supports this option shall be able to send and receive an Imaging Result Payload OBX Segment of type “ED” for “HL7 CDA” or type “RP” for “Reference Pointer” to a Level 2 CDA as described in RAD TF-3:4.Y1.4.1.2.15.

245 A Report Consumer that supports this option shall be able to properly use an Imaging Result Payload OBX Segment of type “ED” for “HL7 CDA” or type “RP” for “Reference Pointer” to a Level 2 CDA as described in RAD TF-3:4.Y1.4.1.2.15.

X.2.4 Imaging Report as HL7 CDA Level 3 Option

250 This option enables actors to exchange reports formatted as xml wrapped text with section headers and structured and coded data as defined by HL7 CDA Level 3. The content of the CDA document shall conform with HL7 v3 CDA Level 3 specifications, or, preferably with DICOM Part 20 “Imaging Reports in HL7 CDA” Level 3 specifications.

A Report Creator that supports this option shall create an Imaging Result Payload OBX Segment of type “ED” for “HL7 CDA” or type “RP” for “Reference Pointer” to a Level 3 CDA as described in RAD TF-3:4.Y1.4.1.2.15.

255 A Report Manager that supports this option shall be able to send and receive an Imaging Result Payload OBX Segment of type “ED” for “HL7 CDA” or type “RP” for “Reference Pointer” to a Level 3 CDA as described in RAD TF-3:4.Y1.4.1.2.15.

A Report Consumer that supports this option shall be able to properly use an Imaging Result Payload OBX Segment of type “ED” for “HL7 CDA” or type “RP” for “Reference Pointer” to a Level 3 CDA as described in RAD TF-3:4.Y1.4.1.2.15.

260 **X.3 RD Required Actor Groupings**

An actor from this profile shall implement all of the required transactions and/or content modules in this profile *in addition to* all of the transactions required for the grouped actor.

Section X.5 describes some optional groupings that may be of interest for security considerations and Section X.6 describes some optional groupings in other related profiles.

265

Table X.3-1: Results Distribution - Required Actor Groupings

RD Actor	Actor to be grouped with	Reference	Content Bindings Reference
Report Creator	IHE ITI Consistent Time (CT) Time Client	IHE ITI TF-1: 7	--
Report Manager	--	--	--
Report Consumer	--	--	--

X.4 RD Overview

This profile communicates imaging results (i.e., reports) to a provider.

270 The content of those results may include some or all:

- preliminary, final, and amended results status

- normal, non-critical, urgent, or emergent results
- structured, coded findings
- references to imaging studies
- 275 • radiologist’s recommendations
- radiology requests for feedback and follow-up
- the radiology results content as text or an HL7 CDA document
- an amendment with the full results content

X.4.1 Concepts

280 Many current radiology reporting systems create simple, unstructured text reports. More advanced reporting systems are capable of creating discrete data and attaching a code to that information.

A DICOM Part 20 CDA document may be sent using this profile. DICOM^{®3} Part 20 “Imaging Reports in HL7 Clinical Document Architecture” provides a CDA format that supports a full
285 relational data model. HL7 CDA supports three different levels of completeness:

- Level 1 – xml wrapped text
- Level 2 – xml wrapped text with section headers
- Level 3 – xml wrapped text with section headers and structured and coded data

X.4.1.1 Reports versus Results

290 The terms “reports” and “results” are often used interchangeably. Additionally, the terms “measurements” and “reports” are sometimes used interchangeably. HL7 v2 refers to “Observation Results”. In most healthcare facilities, however, providers will often ask for “the radiology report”.

295 In this profile, the term “imaging result” is used to refer to a complete set of observations containing all of the findings and impressions observed in a radiology imaging study. Some measurements may be obtained by importing DICOM Structured Reports (SR) objects.

The DICOM SR information object is often used to convey ultrasound measurements in a structured and coded object.

X.4.1.2 Clinical Reporting Guidelines

300 The American College of Radiology (ACR), the European Society of Radiology (ESR), and several other societies have jointly issued recommendations (see <reference to be added>)

³ DICOM is the registered trademark of the National Electrical Manufacturers Association for its standards publications relating to digital communications of medical information.

regarding the basic content of imaging results. These recommendations include the following sections:

1. Clinical Information (about the patient and medical history)
- 305 2. Current Imaging Procedure Description
3. Comparison Studies
4. Findings
5. Impression

The recommendations also provide guidance on addenda.

310 **X.4.1.3 Report Templates and Classification Systems**

The content, structure, and consistency of imaging results may benefit from the use of report templates and classification systems.

The IHE Radiology Management of Radiology Report Templates (MRRT) Profile (http://ihe.net/uploadedFiles/Documents/Radiology/IHE_RAD_Suppl_MRRT.pdf) supports
315 templates for report content of specific imaging procedures (e.g., Two-view Chest X-ray or CT lung screening). Examples of the clinical report templates may be found at www.radreport.org.

ACR, ESR, and other societies have developed classification systems, or well-defined categories, which describe the stage of particular condition. One example is breast imaging radiology screening categories (BI-RADS). These categories include “Category 1” which is defined as
320 “Negative – no significant abnormality” to “Category 5” which is defined as “Highly suggestive of malignancy – Appropriate action should be taken”.

A BI-RADS classification can be incorporated into a MRRT report template for Mammography screening.

X.4.1.4 Actionable Findings, Timing, and Results Priority

325 An actionable finding is an observation discovered in an imaging study during interpretation by a radiologist. This finding may be actionable (i.e., requires action) or non-actionable (commented upon, but no action required, e.g., “the spleen is enlarged”). Actionable findings are categorized by the amount of time required to respond to the finding, which in turn, determines the priority of the finding.

330 An example of a finding is the observation of a lung nodule in a chest CT study. Depending on the size of the lung nodule, the radiology follow-up recommendation may vary. For example, according the Fleischer Criteria, a solitary nodule between 6mm and 8mm in a low risk patient is an actionable finding. The patient should have the study repeated in 6 to 12 months.

The ACR recommends ([http://www.jacr.org/article/S1546-1440\(13\)00840-5/pdf](http://www.jacr.org/article/S1546-1440(13)00840-5/pdf)) that findings
335 be categorized as:

- Normal - the observation is as expected or unremarkable

- Non-actionable - the observation may not quite be as expected, or not strictly normal, e.g., “the spleen is slightly enlarged”
- Actionable:

- 340
- Category 1 - Emergent findings requiring immediate medical attention within minutes
 - Category 2 – Urgent findings requiring medical attention with hours
 - Category 3 – Non-critical findings requiring medical attention within days to months

345 This profile provides a method to assign coded values, e.g., the ACR Actionable Findings Categories or a local coding system, to individual findings. A summary value is also assigned to the imaging results as a whole and represents the “worst case” finding, although other categories of findings may also be present.

350 ACR Actionable Findings Categories 1 and 2 are usually handled within a hospital, often by person-to-person communications. The IHE Radiology Follow-up of Non-critical Actionable Findings (FUNC) Profile focuses on the ACR Category 3 findings.

X.4.1.5 Voice dictation

355 There is a misconception that voice recognition (“dictation”) cannot be used to create structured or coded report entries. In fact, there is no correlation between the data entry method, whether template driven or simplistic free text, or any other data entry method is used. The term “structured dictation” has been used to indicate the use of voice recognition for reporting templates.

There is no correlation between the data entry method of a reporting system and this profile.

X.4.1.6 Coded Results, Structured and Synoptic Reports

360 A “coded result” is a value that has a unique code that is machine readable. The code is selected from a code system or “dictionary”. Common code systems include RadLex, LOINC, and SNOMED, but a vendor or site may also define a local code system. An example of a coded value is “39607008” which is the SNOMED CT code for “lung”.

365 Structured reports contain discrete pieces of information, which may or may not contain coded results. Synoptic reports are structured reports where some or all of the data elements must be coded results. DICOM Part 20 “Imaging Reports in HL7 Clinical Document Architecture (CDA)” defines encodings for structured reports including support for coded results.

The U.S. Health and Human Services Office of the National Coordinator (ONC) has stated a goal of facilitating “computer process-able” results (see <reference to be added>).

370 Cancer Care Ontario has adopted entirely coded synoptic reports in pathology which allows “for the standardized collection, transmission, storage, retrieval and sharing of data between clinical information systems.”
(https://www.cancercare.on.ca/ocs/clinicalprogs/imaging/synoptic_radiology_reporting/)

For additional information, see “The Radiology Report”.

375 Langlotz, Curtis P. *The Radiology Report: A Guide to Thoughtful Communication for Radiologists and Other Medical Professionals*. CreateSpace Independent Publishing Platform, 2015.

X.4.1.7 Imaging Result Payload Formats

An HL7 ORU message does not specify the format of results payload.

380 The RD Profile has standardized the imaging results metadata in an HL7 v2.5.1 message, but can support various payload formats, by value or by reference.

The RD Profile does not specify the content of the payload other than to create named options (see Section X.3) for the payload types. These options range from simplistic plain text, all three levels of HL7 CDA. It is highly recommended to use DICOM Part 20 “Imaging Reports in HL7 Clinical Document Architecture” for CDA content.

385 X.4.2 Use Cases

X.4.2.1 Use Case 1: Simple case – send imaging results to an EMR

After an imaging study is completed at the modality, the images are interpreted and imaging results are created and signed. The imaging results are sent to the EMR for permanent archiving and maintenance, as well as for access by providers such as the ordering or referring physicians.

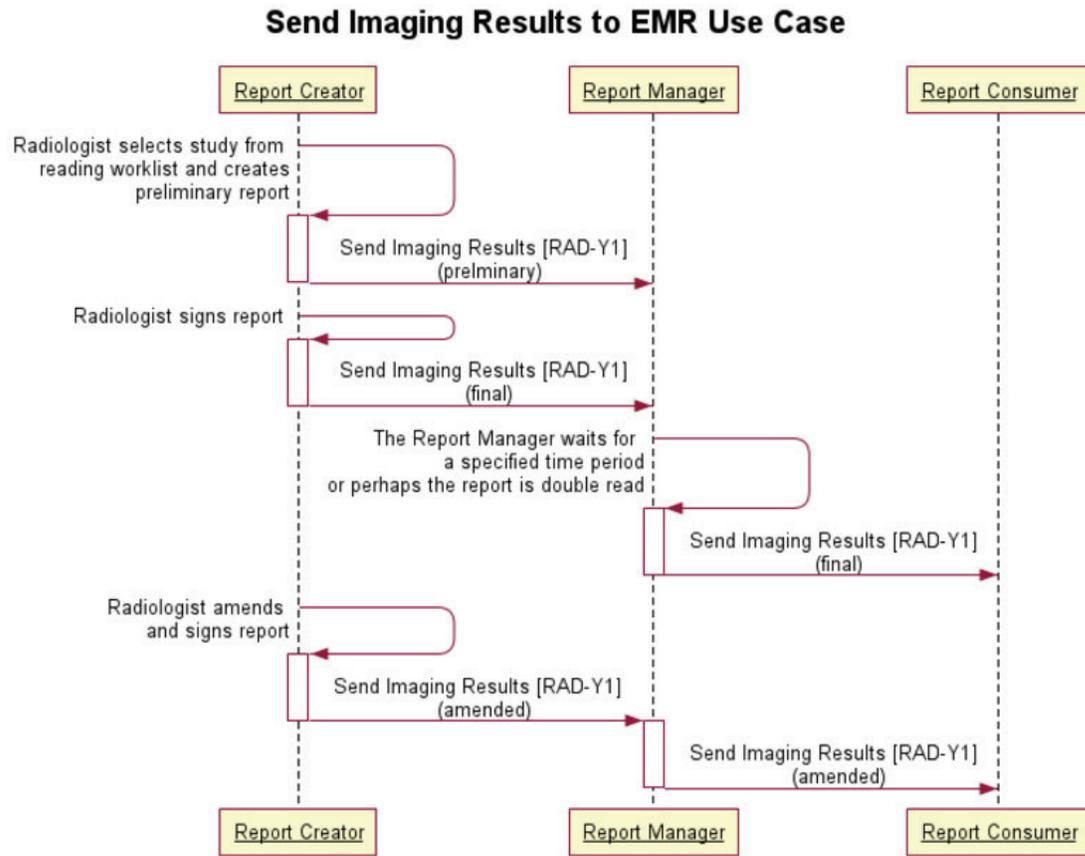
390 X.4.2.1.1 Send imaging results to an EMR Use Case Description

The radiologist selects a study to be read from a reading worklist, views the images, and creates imaging results (i.e., a radiology report). The reading worklist may be in a PACS or EMR, but that is outside the scope of this profile.

395 The imaging results may be signed at the Report Creator system and sent to a Report Manager. If the results are not yet signed, perhaps created by a resident and awaiting an overread, the results will be sent with a status of preliminary. Once the results are signed, the business logic of the Report Manager may dictate when the results are sent to a Report Consumer. The results may be sent immediately or held for some time period, such as when batch sending to a cancer registry.

400 If, for whatever reason, the radiologist chooses to amend the report at the Report Creator or Report Manager, the complete amended results are then sent to the Report Consumer.

X.4.2.1.2 Send imaging results to an EMR Process Flow



405

Figure X.4.2.1.2-1: Send imaging results to an EMR Process Flow

X.4.2.2 Use Case 2: Non-critical actionable finding trigger

As an imaging study is being interpreted, the radiologist may identify unexpected or incidental findings such as nodules in the lung. This profile is intended to provide sufficiently rich data to be able to reliably inform the provider of the “non-critical actionable finding”.

410

X.4.2.2.1 Non-critical actionable finding trigger Use Case Description

In this use case, if the Report Consumer is grouped with an IHE Radiology Follow up of Non-critical Findings (FUNC) Follow-up Source, the priority and actionable category values will act as a trigger event at the Follow-up Source to notify the proper provider of the incidental finding, preferably also including a radiology follow-up recommendation.

415

During a typical radiology study interpretation process, the radiologist discovers an incidental, non-critical finding. The information about the finding, radiology recommendation, request for feedback is created as part of the content of the report and also mapped into the metadata of the

420 report. This information is used as a trigger to create an Alert Notification Plan by the FUNC Follow-up Source which will ensure notification to the appropriate provider.

X.4.2.2.2 Non-critical actionable finding trigger Process Flow

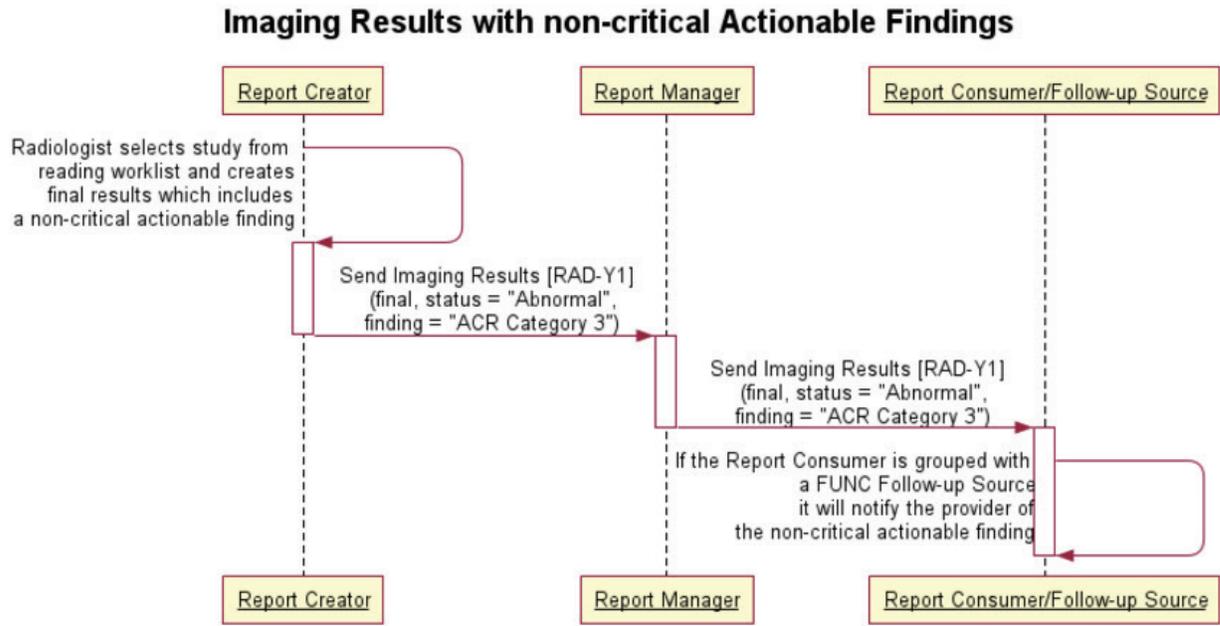


Figure X.4.2.2.2-1: Non-critical actionable finding trigger Process Flow

425

X.5 RD Security Considerations

The significant risk in this profile is that Personal Healthcare Information (PHI) is present in both the transmission metadata as well as the message payload.

430 Tampering with or unauthorized access to imaging results by unauthorized persons is a significant concern. Facilities commonly have various forms of control limiting access to authorized personnel. Similar considerations apply to all actors in this profile.

435 The behavior of the Report Consumer is not restricted and the results content may be used in a variety of ways, including storing the imaging results in an EMR or Patient Portal. If the imaging results are stored in a Patient Portal there is a risk of a patient viewing the content of the imaging results prior to consultation with a provider.

Results Management systems might be targets of malicious attacks; to mitigate this risk authentication protections are appropriate. This profile strongly recommends implementation of Authenticate Node [ITI-19] as a Secure Node to further ensure the integrity of transactions. Implementers are advised to take advantage of the authentication and communication encryption

440 capabilities [ITI-19] provides between secure nodes and to take advantage of TLS when communicating over the internet.

The ITI profiles for Enterprise User Authentication (EUA) and Internet User Authorization (IUA) may be useful both for authentication of operators and for accurately logging events about those users.

445 **X.6 RD Cross Profile Considerations**

The RD actors would operate in a more automated fashion if grouped with other IHE profiles and actors. These are given in the table and described below. In addition to the IHE profile actor grouping, it is strongly recommended that the Report Creator create the imaging results using DICOM Part 20 “Imaging Results in HL7 CDA” Level 3.

450

Table X.6-1: Cross Profile Considerations Recommendations

RD Actor	Might group with	Potential Purpose
Report Creator	IHE Rad Management of Radiology Report Templates (MRRT) Report Creator	Generate radiology reports using a consistent, coded, complete template
Report Manager	IHE ITI Consistent Time Client	Ensure consistent time stamps throughout enterprise
Report Consumer	IHE ITI Consistent Time Client	Ensure consistent time stamps throughout enterprise
	IHE Rad Scheduled Workflow (SWF.b) Image Display, Evidence Creator, and/or Performed Procedure Step Manager	Incorporate results to complete the workflow cycle
	IHE Rad Invoke Image Display (IID) Image Display Invoker	Display images as part of imaging results
	IHE ITI Cross Enterprise Document Sharing (XDS.b) Document Source (and other related Cross Enterprise Sharing Profiles) (see Note 1)	Distribute imaging results throughout enterprise

Note 1: The mapping of the metadata of the imaging results to the recipient domain is not explicitly defined.

Volume 3 – Transactions

455

Add Section 4.Y1

4.Y1 Send Imaging Results [RAD-Y1]

4.Y1.1 Scope

460 This transaction is meant to be broadly applicable for the communication of imaging results (i.e., a radiology report) as an HL7 v2.5.1 Unsolicited Observation (ORU) message. The imaging results content may be text or a CDA document, including DICOM Part 20.

This transaction has been limited to one imaging result or amended imaging result per ORU message. The complete result or complete amended result is contained in an OBX segment, coded with a LOINC code as a “Diagnostic Imaging Report”.

465 The result may include normal, non-actionable, non-critical actionable, or critical actionable findings, which is represented in “priority” element as described.

470 In an attempt to move towards structured and coded result content, this ORU message may contain a series of optional, semi-structured and coded OBX segments. These OBX segments are not intended to replace a Level 3 HL7 CDA structured and coded result. Rather, these OBX segments are meant to provide a near-term bridge solution, which is more palatable and easily implemented, as opposed to changing technologies from HL7 v2.5.1 to CDA, SDC, or FHIR^{®4}. These OBX segments cannot be as rich in detail, nor provide the ability to represent data model relationships, as can CDA, SDC, or FHIR, which are the longer-term end goals.

4.Y1.2 Actor Roles

475 The Roles in this transaction are defined in the following table and may be played by the actors shown here:

Table 4.Y1.2-1 Actor Roles

Role:	Sender: Sends an imaging result.
Actor(s):	The following actors may play the role of Sender: Report Creator- when sending to a Report Manager Report Manager- when sending to a Report Consumer

⁴ FHIR is the registered trademark of Health Level Seven International.

Role:	Receiver: Receives an imaging result.
Actor(s):	The following actors may play the role of Receiver: Report Manager- when receiving from a Report Creator Report Consumer - when receiving from a Report Manager Follow-up Source- when receiving from a Report Manager

480 Transaction text specifies behavior for each Role. The behavior of specific actors may also be specified when it goes beyond that of the general Role.

4.Y1.3 Referenced Standards

HL7 Messaging Standard v.2.5.1, Observation Reporting (Chapter 7)

HL7 Messaging Standard v2.5.1, Control (Chapter 2)

485 RAD TF-2: 2.3.1 Conventions for HL7 v2.5.1 messages

4.Y1.4 Interaction Diagram

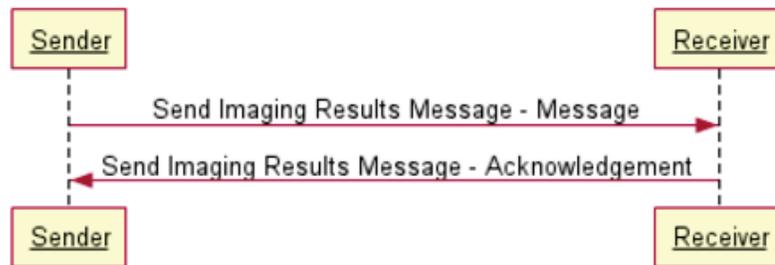


Figure 4.Y1.4-1: Interaction Diagram

490

4.Y1.4.1 Send Imaging Results Message

The Sender sends an imaging result (e.g., a radiology report) to the Receiver.

The Sender shall be able to send imaging results to more than one Receiver. The Receiver shall support handling such messages from more than one Sender.

495 **4.Y1.4.1.1 Trigger Events**

The Sender determines, or is instructed by an operator, that it is necessary to send image results to the Receiver.

4.Y1.4.1.2 Message Semantics

500 The message is an HL7 2.5.1 ORU R01 message. The Sender is the HL7 sender. The Receiver is the HL7 recipient. The content is an imaging result (e.g., radiology report) as text, as a CDA document, or by a reference pointer. This HL7 v2.5.1 ORU message is very similar to an HL7 v2.3 ORU message with the addition of the ROL and TQ1 segments.

The Sender shall encode the ORU message as defined in this section.

505 **Table 4.Y1.4.1.2-1: HL7 v2.5.1 Send Imaging Results (ORU) Message**

ORU^R01 Segments	Message Content	HL7 v2.5.1 Chapter	Reference
MSH	Message Header	2	4.Y1.4.1.2.1 MSH Segment
EVN	Event Type	3	4.Y1.4.1.2.2 EVN Segment
PID	Patient Identification	3	4.Y1.4.1.2.3 PID Segment
PV1	Patient Visit	3	4.Y1.4.1.2.4 PV1 Segment
{ROL}	Role	15	4.Y1.4.1.2.5 ROL Segment
[ORC]	Order Common	4	4.Y1.4.1.2.6 ORC Segment
OBR	Order Detail	4	4.Y1.4.1.2.7 OBR Segment
TQ1	Timing/Quantity	4	4.Y1.4.1.2.8 TQ1 Segment
{OBX}	Observation/Result (See Note 1)	7	4.Y1.4.1.2.9-11 OBX Segments

Adapted from the HL7 Standard, version 2.5.1

Note 1: The OBX segment may repeat because there are different types of OBX segments defined in this transaction, independently identified by coded values in *OBX-3 Observation Identifier*.

510 This ORU message shall contain only one OBX segment with the imaging results content identified by *OBX-3 Observation Identifier* = “18748-4^Diagnostic Imaging Report^LN”. That is, there is only one imaging result per ORU message. The imaging result content in the *OBX-5* field of this OBX segment shall contain the complete imaging result or the complete amended imaging result. See Section 4.Y1.4.1.2.14 for additional details.

515 See RAD TF-2: 2.3.1 “Conventions for HL7 v2.5.1 messages” for a complete definition of the Optionality (OPT) column of the message segments and other notation.

See ITI TF-2b: 3.30.5.1 for additional information on HL7 v.2.5 segment and element descriptions. This ORU message does not conflict with ITI TF-2b: 3.30.5.1, rather it further constrains element optionality.

520 HL7 MDM messages are not included in this transaction. For encapsulated imaging results using HL7 v2.5.1 MDM messages, refer to IHE Cardiology Displayable Reports (DRPT) Trial Implementation Supplement CARD TF-2: 4.7.1.

4.Y1.4.1.2.1 Mapping of Priority and Statuses of Findings

525 A finding is the interpretation a radiology study and is the specific item being commented upon in an imaging result, e.g., “size of nodule” or “spleen is normal/abnormal”. Quantitative or qualitative findings may be normal or abnormal. Additionally, an abnormal finding may be actionable or non-actionable.

For example, the American College of Radiology (ACR) Actionable Findings Guidelines has defined four categories based on response time required for each finding:

- 530
- Normal - normal, unremarkable, or non-actionable finding
 - Category 1 - Communication within Minutes
 - Category 2 - Communication within Hours
 - Category 3 - Communication within Days

ACR reference: <http://dx.doi.org/10.1016/j.jacr.2013.12.016>

535 [http://www.jacr.org/article/S1546-1440\(13\)00840-5/abstract](http://www.jacr.org/article/S1546-1440(13)00840-5/abstract)

These ACR Actionable Findings Categories have been mapped to RadLex codes.

Local jurisdictions may have other actionable findings categories defined.

540 Each discrete finding may be mapped into a separate OBX segment. If so, each finding may be identified and coded, assigned a priority, and a follow-up priority. The ACR or local follow-up categories shall be mapped into the OBX segment (OBX-15.1 - 15.3 Producer’s Reference).

545 The OBR segment of an ORU message provides the overall “meta data” for an imaging result in a single field (the OBR level is not at the level of each finding). Therefore, the finding with the “worst category” shall be mapped to the metadata. For example, a Category 1 finding trumps a Category 2 or Category 3 finding, so the entire result would be categorized by the Category 1 status in the OBR segment (OBR-27.6 Priority and TQ1-9.1 Priority). It is possible for multiple findings within a single ORU to have different actionable categories. For example, one imaging result could contains findings which are normal, Category 3, Category 2, and Category 1 findings all within the same ORU message.

HL7 v2.5.1 provides two types of status and priority codes:

550 In the OBX segment, *OBX-8.1 - 8.3 Abnormal Flag* uses values from HL7 v2.5.1 Abnormal Flag (Table 0078):

- N - normal
- A - abnormal
- AA - Critical abnormal

555 In the OBR segment, *OBR-27.6 and TQ1-9.1 Priority* elements use values from HL7 v2.5.1 Priority (Table 0485):

- R - Routine

- A - ASAP
- S - STAT

560 For ACR Actionable Findings Guidelines compatibility with HL7 v2.5.1, the following mapping table is provided. This table may be read from left to right for mapping. **In ascending order**, Finding OBX-8 and OBX-15 field contains one of the following, then the Imaging Result Content OBX-8 and the OBR/TQ1 mappings will be followed:

	Finding OBX		Imaging Result Payload OBX (i.e., the complete imaging result as text, CDA, or by reference)		OBR
Name and code of segment:	Finding OBX (OBX-3 = “59776-5^Procedure Findings^LN”)		Result Content OBX(OBX-3 = “18748-4^Diagnostic Imaging Report^LN”)		OBR segment
Multiplicity of segment:	repeating		single		single
Optionality of segment:	optional		required		required
Key Field	Abnormal Flag	Category	Abnormal Flag	Category	Priority
Segment fields:	<i>OBX-8.1 - 8.3 Abnormal Flag</i>	<i>OBX-15.1 - 15.3 Producer’s Reference</i>	<i>OBX-8.1 - 8.3 Abnormal Flag</i>	<i>OBX-15.1 - 15.3 Producer’s Reference</i>	<i>OBR-27.6 and TQ1-9.1 Priority</i>
Value Set:	<i>HL7 v.2.5.1 Table 0078</i>	<i>RadLex code system (See Note 1)</i>	<i>HL7 v.2.5.1 Table 0078</i>	<i>RadLex code system (See Note 1)</i>	<i>HL7 v2.5.1 Table 0485</i>
Normal observation:	N^ Normal^ HL70078	RID13173^ Normal^ RadLex	N^ Normal^ HL70078	RID13173^ Normal^ RadLex	R^ Routine^ HL70078
Non-actionable observation: (see Note 2)	N^Normal^ HL70078	RID50261^ Non-actionable^ RadLex	N^Normal^ HL70078	RID50261^ Non-actionable^ RadLex	R^Routine^ HL70078
Non-critical Actionable Finding observation:	A^Abnormal^HL70078	RID49482^ Category 3 Non-critical Actionable Finding^ RadLex	A^Abnormal^HL70078	RID49482^ Category 3 Non-critical Actionable Finding^ RadLex	R^ Routine^ HL70078
Urgent Actionable Finding observation:	AA^Critical Abnormal^ HL70078	RID49481^ Category 2 Urgent Actionable Finding^ RadLex	AA^Critical Abnormal^ HL70078	RID49481^ Category 2 Urgent Actionable Finding^ RadLex	A^ASAP^ HL70078

Emergent Actionable Finding observation:	AA^Critical Abnormal^ HL70078	RID49480^ Category 1 Emergent Actionable Finding^ RadLex	AA^Critical Abnormal^ HL70078	RID49480^ Category 1 Emergent Actionable Finding^ RadLex	S^STAT^ HL70078
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565

Note 1: An *OBX-15.1 - 15.3 Producer's Reference* mapping will need to be defined if a local coding system is used rather than the ACR Actionable Findings Categories.

Note 2: Examples of a non-actionable finding are “The spleen is slightly enlarged” or “Mild degenerative changes in the spine.” In these examples, the finding is not strictly “normal”, but is not intended to be actionable. Another example is a “pertinent negative” such as the absence of abnormal findings based on the clinical question, which was presented.

570

4.Y1.4.1.2.2 MSH Segment

The MSH segment shall be constructed as defined in ITI TF-2b: 3.30.5.1 MSH – Header Segment.

Field *MSH-9-Message Type* shall have three components. The first component shall have a value of ORU; the second component shall have value of R01. The third component shall have a value of ORU_R01.

575

4.Y1.4.1.2.3 EVN Segment

The EVN segment shall be constructed as defined in ITI TF-2b: 3.30.5.2 EVN – Event Type Segment.

Additional required and conditionally required fields are specified in Table 4.Y1.4.1.2.3-1.

580

Table 4.Y1.4.1.2.3-1: HL7 v2.5.1 ORU EVN Segment

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
2	26	TS	R		00100	Recorded Date/Time

Adapted from the HL7 Standard, version 2.5.1

585

Field *EVN-2 Recorded Date/Time* shall contain the date and time the imaging result was signed or amended. It shall be the same value as *OBR-22 Results Rpt/Status Chng - Date/Time*.

4.Y1.4.1.2.4 PID Segment

The Patient Identification (PID) Segment definition is based on HL7 Version 2.5.1. (Chapter 3, Patient Administration). This definition does not conflict with the PID Segment as defined in ITI TF-2b: 3.30.5.3 PID – Patient Identification Segment.

590

The PID Segment defined in HL7 v2.5.1 Ch 3.4.2 is further constrained as specified in Table 4.Y1.4.1.2.4-1. All other elements are optional.

Table 4.Y1.4.1.2.4-1: HL7 v2.5.1 ORU PID Segment

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
2	20	CX	X		00105	Patient ID
3	250	CX	R		00106	Patient Identifier List
4	20	CX	X		00107	Alternate Patient Identifier List
5	250	XP	R		00108	Patient Name
7	26	TS	R2		00110	Date/Time of Birth
8	1	IS	R2	0001	00111	Administrative Sex
9	250	XP	X		00112	Patient Alias
10	250	CE	R2	0005	00113	Race
11	250	XAD	R2		00114	Patient Address
12	4	IS	X	0289	00115	Country Code
13	250	XTN	R2		00116	Phone Number - Home
14	250	XTN	R2		00117	Phone Number - Business
18	250	CX	R2		00121	Patient Account Number (see Note)
19	16	ST	X		00122	SSN Number - Patient
20	25	DLN	X		00123	Driver's License Number - Patient
27	250	CE	R2	0172	00130	Veterans Military Status
28	250	CE	X	0212	00739	Nationality

Adapted from the HL7 Standard, version 2.5.1

595 Field *PID-3 – Patient Identifier List* is required. This field contains a list of identifiers (one or more) used by the healthcare facility to uniquely identify a patient. Subcomponents *PID-3.1* “ID number”, *PID-3.4* “Assigning authority” is required, and *PID-3.5* “Identifier Type Code” is required if known for each identifier.

600 The field *PID-3.5* “Identifier Type Code” may be populated with various identifiers assigned to the patient by various assigning authorities. The values are given in HL7 Table 0203 (HL7 Version 2.5, Chapter 2A, Section 2A.17.5).

Values commonly used for Identifier Type Code in the context of *PID-3.5* are as follows:

BC Bank card number. Assigning authority is the bank.

605 BR Birth Certificate number. Assigning authority is the birth state or national government that issues the Birth Certificate.

DL Driver's license number. Assigning authority is the state

NH National Health Plan Identifier. Assigning authority at the national level.

PE Living Subject Enterprise Number. Assigning authority is the enterprise.

PI Patient Internal Identifier assigned by the healthcare organization.

610 PPN Passport number.

PRC Permanent Resident Card Number

SS Social Security Number.

ITI TF-2b: 3.30.5.3 and ITI TF-2x: Appendix N.1 contain additional descriptions on *PID-3* and the constrained profile definition of data type CX.

615 **4.Y1.4.1.2.5 PV1 Segment**

The Patient Visit (PV1) Segment definition is based on HL7 Version 2.5.1. (Chapter 3, Patient Administration). This definition does not conflict with the PV1 Segment as defined in ITI TF-2b: 3.30.5.4 PV1 – Patient Visit Segment.

620 The PVI Segment defined in HL7 v2.5.1 Ch 3.4.3 is further constrained as specified in Table 4.Y1.4.1.2.5-1. All other elements are optional.

Table 4.Y1.4.1.2.5-1: HL7 v2.5.1 ORU PV1 Segment

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
2	1	IS	R	0004	00132	Patient Class
3	80	PL	R2		00133	Assigned Patient Location
6	80	PL	R2		00136	Prior Patient Location
7	250	XCN	R2	0010	00137	Attending Doctor
8	250	XCN	R2	0010	00138	Referring Doctor
9	250	XCN	X	0010	00139	Consulting Doctor
10	3	IS	C	0069	00140	Hospital Service
17	250	XCN	R2	0010	00147	Admitting Doctor
19	250	CX	R2		00149	Visit Number
40	1	IS	X	0116	00170	Bed Status
51	1	IS	C	0326	01226	Visit Indicator
52	250	XCN	R2	0010	01274	Other Healthcare Provider

Adapted from the HL7 Standard, version 2.5.1

625 Note that fields *PV1-3-Assigned Patient Location*, *PV1-10-Hospital Service*, and *PV1-17 Admitting Doctor* are primarily applicable to in-hospital patients. If the patient is an outpatient, these fields may be omitted.

630 There shall be an ROL segment shall be present for each of *PV1-7 Attending doctor*, *PV1-8 Referring doctor*, *PV1-17 Admitting doctor*, or *PV1-52 Other Healthcare Provider* which is valued.

The PV1 segment shall be followed by an ROL segment for each attending doctor, admitting doctor, and referring doctor. Field *PV1-9-Consulting Doctor* shall not be present, but, per the HL7 v2.5.1 standard, the ROL segment for a Consulting Doctor may be present. The doctor(s) and roles are described in the ROL segments.

635 Field *PV1-51 Visit Indicator* shall be valued with value “V” to indicate a “Visit”, as opposed to account information, if the field *PV1-19 Visit Number* is valued.

4.Y1.4.1.2.6 ROL Segment

640 The Role (ROL) Segment definition is based on HL7 Version 2.5.1. (Chapter 15, Personnel Management). This definition does not conflict with the ROL Segment as defined in ITI TF-2b: 3.30.5.6 ROL – Role Segment.

The ROL segment communicates information on persons related to the patient.

An ROL segment shall be present for each of *PV1-7 Attending doctor*, *PV1-8 Referring doctor*, *PV1-17 Admitting doctor*, or *PV1-52 Other Healthcare Provider* which is valued in the *PV1* segment.

645 The ROL Segment defined in HL7 v2.5.1 Ch 15.4.7 is further constrained as specified in Table 4.Y1.4.1.2.6-1. All other elements are optional.

Table 4.Y1.4.1.2.6-1: HL7 v2.5.1 ORU ROL Segment

SEQ	LEN	DT	Usage	TBL#	ITEM #	ELEMENT NAME
1	60	EI	C		01206	Role Instance ID
2	2	ID	R	0287	00816	Action Code = “AD”
3	250	CE	R	0443	01197	Role-ROL
4	250	XCN	R		01198	Role Person
5	26	TS	R2		01199	Role Begin Date/Time
6	26	TS	R2		01200	Role End Date/Time
11	250	XAD	R2		00679	Office/Home Address/Birthplace
12	250	XTN	R2		00678	Phone

650 Field *ROL-2 Action Code* shall be “AD” for “Add”.

Field *ROL-3 Role* is required. This field defines the functional involvement of the person. Values are given in *User-defined Table 0443*, shown in Table 4.Y1.4.1.2.6-2.

655

Table 4.Y1.4.1.2.6-2: HL7 v2.5.1 User-defined Table 0443: Provider role

Value	Description	Used with
AD	Admitting	PV1-17 Admitting doctor
AT	Attending	PV1-7 Attending doctor
CP	Consulting Provider	
FHCP	Family Health Care Professional	
PP	Primary Care Provider	
RP	Referring Provider	PV1-8 Referring doctor
RT	Referred to Provider	

660

Field *ROL-4 Role Person* is required and identifies the person playing the role. Subcomponents *ROL-4.2 “Family Name”* and *ROL-4.3 “Given Name”* shall be valued. It is strongly recommended that *ROL-4.1 “ID Number”* and *ROL-4.9 “Assigning Authority”*, at a minimum, are also valued.

Field *ROL-11 Office/home address/Birthplace* and *ROL-12 Phone* shall be valued, if known. These fields may be useful in contacting the follow-up Recipients in the FUNC Profile.

4.Y1.4.1.2.7 ORC Segment

665

The Common Order (ORC) segment conveys common order information. In an HL7 v.2.5.1 ORU message, however, the OBR segment is intended to primarily convey the imaging result specific information. Therefore, it is recommended that the ORC segment is not sent in this ORU message. If the Sender chooses to send information in an ORC segment, it shall ensure that the ORC information is identical to the analogous fields in the OBR segment, including the mandatory mapping fields defined in HL7 v.2.5.1. The ORC segment may be necessary for some systems for backward compatibility in an ORU message.

670

If the ORC segment is included it shall not conflict with HL7 v.2.5.1 Chapter 4.5.1 (Common Order Segment).

4.Y1.4.1.2.8 OBR Segment

675

The HL7 v2.5.1 Observation Request (OBR) Segment defines attributes (“metadata”) specific to the imaging result. The imaging result payload itself is contained in an OBX segment.

The OBR segment definition is based on HL7 Version 2.5.1 (Chapter 4, Order Entry).

The OBR Segment defined in HL7 v2.5.1 Chapter 4.5.3 is further constrained as specified in Table 4.Y1.4.1.2.8-1. All other elements are optional.

680

Not all attributes in the OBR segment are applicable to an unsolicited imaging results message. Several of the attributes defined in the OBR segment are specific to laboratory values while other attributes are used response to an order placer system. While these attributes are optional in the

HL7 specification, they are listed at the end of this section for clarity. These attributes are not prohibited (“X”), but their presence in this message would be unusual.

685

Table 4.Y1.4.1.2.8-1: HL7 v2.5.1 ORU OBR Segment

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
2	22	EI	R2		00216	Placer Order Number
3	22	EI	R2		00217	Filler Order Number
4	250	CE	R		00238	Universal Service ID
5	2	ID	X		00239	Priority (retired)
6	26	TS	X		00240	Requested Date/time
7	26	TS	R2		00241	Observation Date/Time
12	250	CE	R2		00246	Danger Code
13	300	ST	R2		00247	Relevant Clinical Info.
16	250	XCN	R2		00226	Ordering Provider
17	250	XTN	R2		00250	Order Callback Phone Number
18	60	ST	R		00251	Placer field 1
19	60	ST	R2		00252	Placer field 2
20	60	ST	R2		00253	Filler Field 1
21	60	ST	R2		00254	Filler Field 2
22	26	TS	R		00255	Results Rpt/Status Chng - Date/Time
24	10	ID	R2	0074	00257	Diagnostic Serv Sect ID
25	1	ID	R	0123	00258	Result Status = R, F, or C - Note: See Table 4.Y1.4-8
27	200	TQ	R		00221	Quantity/Timing
28	250	XCN	R2		00260	Result Copies To
31	250	CE	R2		00263	Reason for Study
32	200	NDL	R		00264	Principal Result Interpreter
33	200	NDL	R2		00265	Assistant Result Interpreter
34	200	NDL	R2		00266	Technician
35	200	NDL	C		00267	Transcriptionist
44	250	CE	R2	0088	00393	Procedure Code
46	250	CE	R2	0411	01474	Placer Supplemental Service Information
48	250	CWE	R2	0476	01646	Medically Necessary Duplicate Procedure Reason

The usage of fields *Placer Order Number (ORC-2, OBR-2)* and *Filler Order Number (ORC-3, OBR-3)* is beyond the scope of this transaction and locally defined. In this message, the Placer

690 system is often a HIS or EMR used by a primary care physician or specialist. The Filler system is typically a RIS or EMR ordering component. The Sender in this transaction may obtain the information for these fields from a Procedure Scheduled [RAD-4] transaction or from images that are referenced during the interpretation process. The first three components of field OBR-3 Filler Order Number may also contain the Accession Number if that is the local definition of that field. Also see field *OBR-18 Placer Field 1* for Accession Number.

695 Field *OBR-4 Universal Service ID* shall contain the Performed Procedure Code in the first three components as identifier^text code meaning^coding system. If the Performed Procedure Code is not known, the Requested Procedure Code may be used, but is not recommended. The source of the Performed Procedure Code is beyond the scope of this transaction, but may be an order message (ORM) or DICOM image objects. A universal coding system for procedures such as
700 RadLex is recommended.

Field *OBR-7 Observation Date/Time* is the clinically relevant date/time of the observation; i.e., it is the date/time of the imaging procedure, not the date/time of the imaging result. See the EVN segment for the time of the imaging result. If the date and time of the imaging study is not
705 known, this field should not be sent. The source of the imaging study date and time is beyond the scope of this transaction, but may be the DICOM image objects.

Field *OBR-12-Danger Code* value will most likely be a locally defined or agreed upon value. The second component should hold a text description, if not coded.

Field *OBR-13-Relevant Clinical Info* should be populated if patient record contains any medical alerts that may be relevant. The value will most likely be a locally defined or agreed upon value.
710 The second component should hold a text description, if not coded.

Fields *OBR-16 Ordering Provider* and *OBR-17 Order Callback Phone Number* shall be valued if known. These fields are critical for sending the imaging result where it is needed and for follow-up communication in the FUNC Profile. The information that is populated in these fields is the provider who ordered this imaging study. This may be a primary care provider, a referring
715 provider, a specialist, or may be an order from a provider in the ED department. For *OBR-16*, subcomponents *OBR-16.2* “Family Name” and *OBR-16.3* “Given Name” shall be valued. It is strongly recommended that *OBR-16.1* “ID Number” and *OBR-16.9* “Assigning Authority”, at a minimum, are also valued. All other known components should be included.

Field *OBR-18 Placer Field 1* shall contain the imaging study Accession Number. Note that in the original HL7 2.5.1 semantics for the Procedure Scheduled [RAD-4] transaction the Accession
720 Number is provided in IPC Segment IPC-1, but the IPC Segment is not included in an ORU Message, so the HL7 v2.3.1 interpretation of this field is used.

Field *OBR-20 Filler Field 1* and *OBR-21 Filler Field 2* may be locally defined, but should be sent if valued.

725 Field *OBR-22 Results Rpt/Status Chng - Date/Time* shall contain the date and time the imaging result was signed or amended. It shall be the same value as *EVN-2 Recorded Date/Time*.

Field *OBR-24 Diagnostic Serv Sect ID* should be set to “CUS” for Cardiac Ultrasound, “CTH” for Cardiac Catheterization, “VUS” for Vascular Ultrasound, or “RAD” for a Radiology procedure.

730 Field *OBR-25 Result Status* shall use the values in Table 4.Y1.4-8. The value of *OBR-25* shall be one of “R” (preliminary), “F” (final), or “C” (amended). If an amended imaging result is sent with a status of “C” the entire content of the changed imaging result shall be resent. Differential content alone shall not be sent with a status of “C”. Field *OBR-25* shall be identical to the Imaging Result Content OBX segment field *OBX-11*.

735 Field *OBR-27-Quantity/Timing* shall be present for imaging results with normal or with a non-critical actionable finding present. This field is retained for backwards compatibility only. The 6th component, Priority, shall be set as defined in Section 4.Y1.4.1.2.1. The value of *OBR-27.6 Priority* shall match *TQ1-9.1 Priority*. Other components of *OBR-27* shall not be valued.

740 Field *OBR-28 Copy Results* shall be valued, if known. This field may be useful in identifying the follow-up Recipients in the FUNC Profile.

Field *OBR-31 Reason for Study* shall be valued, if known. This field may be useful in identifying the follow-up Recipients in the FUNC Profile.

745 Field *OBR-32 Principal Result Interpreter* shall be the coded name of the interpreting radiologist who is responsible for the content of the imaging result. For *OBR-32.1*, subcomponents of “Name”: *OBR-32.1^2* “Family Name” and *OBR-32.1^3* “Given Name” shall be valued. It is strongly recommended that *OBR-32.1^1* “ID Number”, *OBR-32.1^8* “Assigning Authority- Namespace”, and *OBR-32.1^9* “Assigning Authority - Universal ID” at a minimum, are also valued. All other known components should be valued. *OBR-32.7* “Facility” should also be valued if known.

750 Field *OBR-33 Assistant Result Interpreter* and *OBR-34 Technician* shall be valued if those roles were used to complete these imaging results and the values are known.

Field *OBR-35 Transcriptionist* shall be valued if dictated imaging results were transcribed.

Field *OBR-44 Procedure Code* shall be included as a coded value in the first three components, if known. This field may be useful for future analytics. *OBR-44* shall match *OBR-4*.

755 Field *OBR-46-Placer Supplemental Service Information* shall contain the laterality (Left/Right) indicator (when used) in the <site modifier (CE)> component. See RAD TF-2: Appendix B for details.

The Result Status values of Table 4.Y1.4.1.2.8-2 shall be supported in field *OBR-25*.

760 **Table 4.Y1.4.1.2.8-2: HL7 v2.5.1 ORU OBR-25/OBX-11 Result Status Values**

Value	Description
R	Results stored; not yet verified (see Note)
P	Preliminary: A verified early result is available, final results not yet obtained (see Note- do not use)

Value	Description
F	Final results; results stored and verified. Can only be changed with a corrected result.
C	Correction to results

Adapted from the HL7 Standard, version 2.5.1, Table 0123

765 Note: Unverified results, commonly referred to as “preliminary”, and are sent with status value “R” rather than “P”. Only results that have had clinician overreading and signature may be sent with status value “P”. “P” is used more in the case of laboratory results, where a final result may be awaiting development of a culture, but the preliminary results are usable for clinical treatment planning.

770 Therefore, the value of “R” should be used for preliminary imaging results. The value “F” is a final, signed imaging result. The value “C” is for an amended/final imaging result. An amended imaging result shall contain the entire imaging result content, not the differential content.

The following OBR segment attributes are intended for laboratory specimen results and are denoted by a “*” in the attribute name of the HL7 v.2.5.1 standard. These attributes are optional, but they are listed here to identify that it would be unusual to use these attributes in an imaging results message:

- 775 • *OBR-9 Collection Volume*
- *OBR-10 Collector Identifier*
- *OBR-11 Specimen Action Code*
- *OBR-14 Specimen Received Date/Time*
- *OBR-15 Specimen Source*
- 780 • *OBR-37 Number of Sample Containers*
- *OBR-38 Transport Logistics of Collected Samples*
- *OBR-39 Collector’s Comments*

4.Y1.4.1.2.9 TQ1 Segment

785 The HL7 v2.5.1 TQ1 Segment defines the priority of the imaging results. The Timing/Quantity (TQ1) Segment definition is based on HL7 Version 2.5.1. (Chapter 4, Order Entry).

The TQ1 Segment defined in HL7 v2.5.1 Chapter 4.5.4 is further constrained as specified in Table 4.Y1.4.1.2.9-1. All other elements are optional.

790

Table 4.Y1.4.1.2.9-1: HL7 v2.5.1 ORU TQ1 Segment

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
9	250	CWE	R	0485	01635	Priority

Adapted from the HL7 Standard, version 2.5.1

795 Field *TQ1-9 Priority* CWE components shall be present for imaging results to identify normal or actionable findings, as defined in Section 4.Y1.4.1.2.1. Field *TQ1-9* shall match *OBR-27.6 Priority*.

4.Y1.4.1.2.10 OBX Segment - DICOM Study Instance UID

800 The Observation/Result (OBX) Segment definition is based on HL7 Version 2.5.1. (Chapter 7, Observation Reporting). This definition does not conflict with the OBX Segment as defined in ITI TF-2b: 3.30.5.7 OBX – Observation/Result Segment.

This OBX segment shall only be included if the DICOM Study Instance UID is known. Multiple DICOM Study Instance UID OBX segments may be sent in one ORU message if the imaging result refers to multiple imaging studies.

805 The OBX Segment defined in HL7 v2.5.1 Chapter 7.4.2 is further constrained as specified in Table 4.Y1.4.1.2.10-1. All other elements are optional.

Table 4.Y1.4.1.2.10-1: HL7 v2.5.1 ORU OBX Segment - DICOM Study Instance UID

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
1	4	SI	R		00569	Set ID – OBX
2	2	ID	R	0125	00570	Value Type =RP
3	250	CE	R		00571	Observation Identifier
4	20	ST	C		00572	Observation Sub-ID
5	99999	HD	R		00573	Observation Value
11	1	ID	R	0085	00579	Observation Result Status = O
23	567	XON	C		02283	Performing Organization Name
24	631	XAD	C		02284	Performing Organization Address
25	3002	XCN	C		02285	Performing Organization Medical Director

Adapted from the HL7 Standard, version 2.5.1

810 Field *OBX-2 Value Type* shall have the value “RP” to indicate that *OBX-5* is a Reference Pointer. Field *OBX-3 Observation Identifier* shall have the value “113014^DICOM Study^DCM” in the first three components.

815 Field *OBX-4 Observation Sub-ID* used to distinguish between multiple OBX segments with the same observation ID. When field *OBX-3 Observation Identifier* has an identical value in two or more OBX segments of the message (i.e., if more than one Study Instance UID is referenced for this imaging result, e.g., a CT abdomen and CT pelvis studies interpreted together), field *OBX-4 Observation Sub-ID* shall be populated with a distinct value in each of these OBX segments.

820 Field *OBX-5 Observation Value* shall include the Study Instance UID as an ISO OID. *Note:* The method by which the Sender obtains the *Study Instance UID (OBX-5)* is beyond the scope of this transaction. The Sender may obtain this information from a DICOM object during the interpretation process (preferred) or a Procedure Scheduled [RAD-4] transaction.

Field *OBX-11 Observation Result Status* shall have the value “O” (Order detail description - no result).

825 Fields *OBX-23 Performing Organization Address*, *OBX-24 Performing Organization Address*, and *OBX-25 Performing Organization Medical Director* should be populated if the imaging study was acquired by an organization which is different from the organization identified in the OBR segment and if the imaging study performing organization is known.

4.Y1.4.1.2.11 OBX Segment - Finding

830 The Observation/Result (OBX) Segment definition is based on HL7 Version 2.5.1. (Chapter 7, Observation Reporting). This definition does not conflict with the OBX Segment as defined in ITI TF-2b: 3.30.5.7 OBX – Observation/Result Segment.

835 This OBX segment should repeat if multiple findings are present. However, not every finding in an imaging result may be brought to the forefront through the creation of a separate OBX segment. The SNOMED CT, ICD-10, LOINC, or other coding system should be considered to convey findings in a well-known manner.

840 This OBX segment should be included if a critical actionable finding, a non-critical actionable, or non-actionable finding is observed. In the FUNC Profile, this OBX segment shall be included for each non-critical actionable findings. Note that it is possible to have multiple “critical” and “non-critical” findings within the same ORU message, but the *OBR-27.6/TQ1-9 Priority* field shall only reflect the “worst case” finding. In the FUNC Profile, all actors shall set or verify the priority of every Finding OBX segment. See Section 4.Y1.4.1.2.1 for additional information.

All findings shall also be contained in the Imaging Results Payload OBX content.

The OBX Segment defined in HL7 v2.5.1 Chapter 7.4.2 is further constrained as specified in Table 4.Y1.4.1.2.11-1. All other elements are optional.

845

Table 4.Y1.4.1.2.11-1: HL7 v2.5.1 ORU OBX Segment - Finding

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
1	4	SI	R		00569	Set ID – OBX
2	2	ID	R	0125	00570	Value Type = CE or TX
3	250	CE	R		00571	Observation Identifier

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
4	20	ST	C		00572	Observation Sub-ID
5	483 or 99999	CE or TX	R		00573	Observation Value
8	5	IS	R	0078	00576	Abnormal flag
11	1	ID	R	0085	00579	Observation Result Status = R, F, C
15	250	CE	R		00583	Producer's Reference

Adapted from the HL7 Standard, version 2.5.1

Field *OBX-2 Value Type* shall have the value “CE” (coded entry) or “ST” (short text).

850 If Field *OBX-2* has the value “CE”, then field *OBX-3 Observation Identifier* shall have the coded value of the finding itself. For example, “[300332007^Liver Mass^SCTID]” would identify a finding of a mass in the liver using the SNOMED CT coding system.

If Field *OBX-2* has the value “ST”, then Field *OBX-3 Observation Identifier* shall have the value “[59776-5^Procedure Findings^LN]”. When *OBX-3* identifies a finding as text, then *OBX-5 Observation Value* contains the text of the actual finding in text.

860 Field *OBX-4 Observation Sub-ID* is typically a sequential integer number, unique within this message, which used to distinguish between multiple OBX segments with the same *OBX-3 Observation ID*. When field *OBX-3 Observation Identifier* has an identical value in two or more OBX segments of the message (i.e., if more than one finding/recommendation in a single imaging result), field *OBX-4 Observation Sub-ID* shall be populated with a distinct value in each of these OBX segments. An example of this for coded entries (*OBX-2* = “CE”) is that different values of *OBX-4 Observation Sub-ID* would differentiate findings of the same code, for example differentiate multiple liver masses. An example of this for text entries (*OBX-2* = “ST”) is that different values of *OBX-4 Observation Sub-ID* would differentiate more than one finding as a plain text. Examples are given below.

870 The sub-components of field *OBX-5 Observation Value* are: <Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)>. When *OBX-2* = “CE”, *OBX-5 Observation Value* Components 1-3 shall be coded as a SNOMED CT, LOINC, ICD-10 or other coded results entry. When *OBX-2* = “ST”, the *OBX-5 Observation Value* shall contain the finding itself as text. Multiple Findings OBX segments may be sent with the same *OBX-3* value, one with *OBX-5* as a coded entry and another with *OBX-5* as additional text information.

Field *OBX-6 Units* should contain the ISO or ANSI units, as defined in HL7 v2.5.1, if the finding is a quantitative measurement.

875 Field *OBX-8 Abnormal Flag* shall use the mapped values defined in Section 4.Y1.4.1.2.1 for normal and abnormal findings. For this OBX segment, the *OBX-8 Abnormal Flag* shall contain the abnormal status which is applicable to this specific finding. The abnormal flag may vary

between OBX Finding segments, based on the abnormality of each individual finding. In the FUNC Profile, *OBX-8 Abnormal Flag* shall be mapped as defined in Section 4.Y1.4.1.2.1.

880 Field *OBX-11 Observation Result Status* shall have the same value as *OBR-25 Result Status*.

Field *OBX-15.1 - OBX-15.3 Producer's Reference* shall use the mapped coded values defined in Section 4.Y1.4.1.2.1 for the category of finding which is indicated in *OBX-8 Abnormal Flag*. For this OBX segment, the *OBX-15 Producer's Reference* shall contain the actionable category which is applicable to this specific finding. The actionable category may vary between OBX

885 Finding segments, based on each individual finding.

Examples of multiple Finding OBX segments including both coded entries and text findings are shown below:

890 OBX|1|ST|859776-5^Procedure Findings^LN|1|This is a comment on a finding about the kidney, but it could be any text and it is hard to determine what part of the anatomy is being described because it is just text. It is even harder to determine the actual finding or measurement.||||N^Normal^HL70078||||F||||RID50261^Non-actionable^RadLex|

895 OBX|2|ST|859776-5^Procedure Findings^LN|2|This is another text comment on a finding, so please note that the Sub-component ID has changed. This finding is about the lungs this time. But, note, it is a non-critical finding about an unexpected mass.||||A^Abnormal^HL70078||||F||||RID49482^Category 3 Non-critical Actionable|Finding^RadLex|

900 OBX|3|ST|300332007^Liver Mass^SCT|1|4mmx6mm|mm||||A^Abnormal^HL70078||||F||||RID49482^Category 3 Non-critical Actionable|Finding^RadLex|

905 OBX|4|ST|300332007^Liver Mass^SCT|2|5mmx7mm|mm||||A^Abnormal^HL70078||||F||||RID49482^Category 3 Non-critical Actionable|Finding^RadLex|

OBX|5|CE|309088003^Renal Mass^SCT|1|C65.2^Malignant neoplasm of left renal pelvis^ICD-10||||AA^Critical Abnormal^HL70078||||F||||RID49481^Category 2 Non-critical Actionable|Finding^RadLex|

910

4.Y1.4.1.2.12 OBX Segment - Radiologist's Recommendation

The Observation/Result (OBX) Segment definition is based on HL7 Version 2.5.1. (Chapter 7, Observation Reporting). This definition does not conflict with the OBX Segment as defined in ITI TF-2b: 3.30.5.7 OBX – Observation/Result Segment.

915 This OBX segment should be included if a non-critical actionable radiology recommendation is present in the study. This is especially useful if the Sender is a Report Manager in the FUNC Profile.

This segment shall be repeated if multiple radiology recommendations are present.

920 The OBX Segment defined in HL7 v2.5.1 Chapter 7.4.2 is further constrained as specified in Table 4.Y1.4.1.2.12-1. All other elements are optional.

Table 4.Y1.4.1.2.12-1: HL7 v2.5.1 ORU OBX Segment - Radiologist's Recommendation

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
1	4	SI	R		00569	Set ID – OBX
2	2	ID	R	0125	00570	Value Type = CE or TX
3	250	CE	R		00571	Observation Identifier
4	20	ST	C		00572	Observation Sub-ID
5	250 or 99999	CE or TX	R		00573	Observation Value
11	1	ID	R	0085	00579	Observation Result Status = R, F, C
15	250	CE	R2		00583	Producer's Reference

Adapted from the HL7 Standard, version 2.5.1

925 The *OBX-2 Value Type* field shall have the value “CE” (coded entry) or “TX” (text).

The *OBX-3 Observation Identifier* field shall have the value “18783-1^Study recommendation^LN”.

930 The *OBX-4 Observation Sub-ID* used to distinguish between multiple OBX segments with the same observation ID. When field *OBX-3 Observation Identifier* has an identical value in two or more OBX segments of the message (i.e., if more than one finding/recommendation in a single imaging result), field *OBX-4 Observation Sub-ID* shall be populated with a distinct value in each of these OBX segments.

935 When *OBX-2* = “CE” (coded entry), the sub-components of *OBX-5 Observation Value* are: <Identifier (ST)> & <Text (ST)> & <Name of Coding System (ID)> & <Alternate Identifier (ST)> & <Alternate Text (ST)> & <Name of Alternate Coding System (ID)>. Components 1-3 shall be coded as a RadLex Playbook or other coded entry. When *OBX-2* = “TX” (text), the *OBX-5 Observation Value* shall contain the recommended follow-up procedure itself as text. An example of *OBX-5* as text could be |Follow-up with CT of the Abdomen without contrast is recommended in 6 months|. Two or more OBX Radiologist's Recommendation segments may be sent, one with a RadLex Playbook Code, and one as descriptive text which may include timing.

940 The *OBX-11 Observation Result Status* shall have the same value as *OBR-25 Result Status*.

945 Field *OBX-15 Producer's Reference* shall contain the Guidelines used to generate the recommendation (e.g., Flieschner's Criteria for lung nodule follow-up), if known. The text description shall be contained in the second component, however, it would be better if a coded value for the guidelines were contained in components 1-3.

4.Y1.4.1.2.13 OBX Segment - Radiologist Requests Consultation

The Observation/Result (OBX) Segment definition is based on HL7 Version 2.5.1 (Chapter 7, Observation Reporting). This definition does not conflict with the OBX Segment as defined in ITI TF-2b: 3.30.5.7 OBX – Observation/Result Segment.

950 This OBX segment should be included if a consultation to the intended recipient is requested by the interpreting physician for this study. This is especially useful if the Sender is a Report Manager in the FUNC Profile.

If this OBX segment is included, it is strongly recommended that *OBR-32 Principal Result Interpreter* is also provided.

955 The OBX Segment defined in HL7 v2.5.1 Chapter 7.4.2 is further constrained as specified in Table 4.Y1.4.1.2.13-1. All other elements are optional.

Table 4.Y1.4.1.2.13-1: HL7 v2.5.1 ORU OBX Segment - Radiologist Requests Consultation

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
1	4	SI	R		00569	Set ID – OBX
2	2	ID	R	0125	00570	Value Type = TX
3	250	CE	R		00571	Observation Identifier
5	99999	TX	R		00573	Observation Value
11	1	ID	R	0085	00579	Observation Result Status = R, F, C

Adapted from the HL7 Standard, version 2.5.1

960

Field *OBX-2 Value Type* shall have the value “TX”.

Field *OBX-3 Observation Identifier* shall have the value “11487-6^Consultation Request^LN”.

965 Field *OBX-5 Observation Value* shall contain the consultation request and preferred communication method. For example, *OBX-5* may contain |Patricia R. Smith, MD, requests a consultation to review findings. Contact at 1-732-123-4567 during normal business hours.|

Field *OBX-11 Observation Result Status* shall have the same value as *OBR-25 Result Status*.

4.Y1.4.1.2.14 OBX Segment - Radiologist Requests Feedback

The Observation/Result (OBX) Segment definition is based on HL7 Version 2.5.1. (Chapter 7, Observation Reporting). This definition does not conflict with the OBX Segment as defined in ITI TF-2b: 3.30.5.7 OBX – Observation/Result Segment.

970

This OBX segment should be included if the interpreting physician has requested feedback for one more recommendations. This is especially useful if the Sender is a Report Manager in the FUNC Profile.

975 If this OBX segment is included, it is strongly recommended that *OBR-32 Principal Result Interpreter* is also provided.

The OBX Segment defined in HL7 v2.5.1 Chapter 7.4.2 is further constrained as specified in Table 4.Y1.4.1.2.14-1. All other elements are optional.

Table 4.Y1.4.1.2.14-1: HL7 v2.5.1 ORU OBX Segment - Radiologist Requests Feedback

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
1	4	SI	R		00569	Set ID – OBX
2	2	ID	R	0125	00570	Value Type = TX
3	250	CE	R		00571	Observation Identifier
5	99999	TX	R		00573	Observation Value
11	1	ID	R	0085	00579	Observation Result Status = R, F, C

980

Adapted from the HL7 Standard, version 2.5.1

Field *OBX-2 Value Type* shall have the value “TX”.

Field *OBX-3 Observation Identifier* shall have the value “74466-4^Feedback to user-post question^LN”.

985

Field *OBX-5 Observation Value* shall contain the feedback request and preferred communication method. For example, *OBX-5* may contain “[Patricia R. Smith, MD, requests a feedback regarding whether or not recommended follow-up study was ordered. Contact at 1-414-123-4567 during normal business hours.]”

Field *OBX-11 Observation Result Status* shall have the same value as *OBR-25 Result Status*.

990

4.Y1.4.1.2.15 OBX Segment - Imaging Result Payload

This Observation/Result (OBX) Segment definition is based on HL7 Version 2.5.1 (Chapter 7, Observation Reporting). This definition does not conflict with the OBX Segment as defined in ITI TF-2b: 3.30.5.7 OBX – Observation/Result Segment.

995

This OBX segment should be included. There may be only one Imaging Payload OBX segment, identified by LOINC code = “18748-4^Diagnostic Imaging Report^LN”, per ORU message.

This OBX segment shall contain the imaging result or the amended imaging result in its entirety. Information may be extracted into other coded OBX segments (e.g., Findings, Radiology Recommendations, Callback requests, etc.), but that information shall also be included in the full content of the report contained in this OBX segment.

1000

The OBX Segment defined in HL7 v2.5.1 Chapter 7.4.2 is further constrained as specified in Table 4.Y1.4.1.2.15-1. All other elements are optional.

If the length of the OBX segment is exceeded, the HL7 v2.5.1 rules of “continuation” as defined in Chapter 2- Control, should be followed.

1005 It is possible, in unusual circumstances, to have an Imaging Results (ORU) message without an Imaging Results Payload OBX segment. One example is a study where the patient moved or was unable to complete the imaging such that the study was not interpretable.

Table 4.Y1.4.1.2.15-1: HL7 v2.5.1 ORU OBX Segment - Imaging Result Payload

SEQ	LEN	DT	OPT	TBL#	ITEM #	ELEMENT NAME
1	4	SI	R		00569	Set ID – OBX
2	2	ID	R	0125	00570	Value Type = TX, ED, RP
3	250	CE	R		00571	Observation Identifier
5	99999	TX or ED	R		00573	Observation Value
8	5	IS	R	0078	00576	Abnormal flag
11	1	ID	R	0085	00579	Observation Result Status = R, F, C
15	250	CE	R		00583	Producer’s Reference

Adapted from the HL7 Standard, version 2.5.1

1010

Field *OBX-2 Value Type* shall have the value “TX” for Text Data, “ED” for a CDA (xml), or “RP” for a Reference Pointer to an object located elsewhere. Field *OBX-3 Observation Identifier* shall have the value “18748-4^Diagnostic Imaging Report^LN”.

1015

The second component of field *OBX-5 Observation Value* shall contain the imaging result itself as text, as a CDA document (xml), or as an ISO formatted OID. Per HL7 v2.5.1, in the TX data type, *OBX-5* shall contain plain text and the repeat delimiter can only be used to identify paragraph breaks. For CDA content, it is recommended that DICOM Part 20 “Imaging Reports in HL7 CDA” constructs be used for *OBX-5*. For a Reference Pointer, only the ISO formatted OID of the imaging results object is given in *OBX-5*. Access and display of that object is beyond the scope of this profile.

1020

Field *OBX-8 Abnormal Flag* shall use the mapped values defined in Section 4.Y1.4.1.2.1 for normal and abnormal findings. This value is important when the report contains a non-critical actionable finding(s) in the FUNC Profile. For this OBX segment, the *OBX-8 Abnormal Flag* shall contain the “worst case” abnormal finding or abnormal imaging result value. Additional critical or non-critical findings may also be present.

1025

Field *OBX-11 Observation Result Status* shall have the same value as *OBR-25 Result Status*.

Field *OBX-15.1 - OBX-15.3 Producer’s Reference* shall use the mapped coded values defined in Section 4.Y1.4.1.2.1 for the category of actionable finding which is indicated in *OBX-8 Abnormal Flag*. For this OBX segment, the *OBX-15 Producer’s Reference* shall contain the “worst case” actionable category.

1030

4.Y1.4.1.3 Expected Actions

The Receiver shall accept and process the message.

If the Receiver is a Follow-up Source in the FUNC Profile and if the received object has:

- the *OBR-27.7/TQ1-9 Priority flag* set to a non-critical actionable finding status
- 1035 • *TQ1-9 Priority* components 3-6 are set to a non-critical actionable finding RadLex code
- the *OBR-25 Report Status* set to “F” (final) or “C” (amended)
- the *OBX-8 Abnormal flags* of the Imaging Result Payload OBX is set to “A”

the Receiver shall track this finding as an open issue and trigger the [RAD-Y2] message as appropriate.

- 1040 If the Receiver is a Report Manager, it may apply application-specific imaging result processing rules (e.g., presentation to a user for verification or signature). The Report Manager shall determine when the imaging result is to be released, or made available, to the enterprise. When the Report Manager has determined that the imaging result is to be made available to the enterprise, it shall guarantee long term storage of the imaging result in the department by forwarding the imaging result to the Report Repository.
- 1045

- 1050 If the Receiver is a Report Manager, it shall support receiving multiple imaging results with same or different titles submitted for the same Order, and if the Order is mapped to multiple Requested Procedures, and then it must support multiple imaging results with different titles submitted for each Requested Procedure identified in the OBX with the Study Instance UID. To uniquely identify each document, each document shall contain a unique document identifier (OID) in TXA -12 of the message.

Note: The Report Manager application-specific processing rules may dictate that some or all unverified or preliminary imaging results are made available to the enterprise, or that only finalized and corrected final imaging results are made available.

1055 4.Y1.4.2 Send Imaging Results Response Message

The Receiver acknowledges receipt of the Send Imaging Results Message to the Sender.

The Sender shall support handling such messages from more than one Receiver. The Receiver shall support acknowledging results from more than one Sender.

4.Y1.4.2.1 Trigger Events

- 1060 The Receiver receives and processes a Send Imaging Results Message.

4.Y1.4.2.2 Message Semantics

The message is an HL7 2.5.1 MSA-1 Enhanced Acknowledgement message. The Receiver is the HL7 acknowledgment sender. The Sender is the HL7 acknowledgment recipient.

1065 The Receiver is not required to send any attributes within the MSA segment beyond what is specified in the HL7 standard. See ITI TF-2x: C.2.3 for the list of all required and optional fields within the MSA segment.

4.Y1.4.2.3 Expected Actions

If the HL7 ORU was invalid, the Receiver should send an invalid message response.

Else, the Receiver shall respond with valid acknowledgment message.

1070